Sustainable eGovernance
HANNU LARSSON

Sustainable eGovernance
Abstract


This thesis focuses on eGovernance – the use of ICT as a means to improve public sector practice. Previous research has shown that there is a lack of long-term discussion on the purposes and directions of eGovernance development, often outlining it as unequivocally positive, while missing to consider the complexities and conflicts involved in this process. In order to understand the complexities of eGovernance a future-oriented perspective is needed. In other words a perspective that not only focuses on using ICT to be responsive to present needs but also making it possible to discuss which goals public sector ICT initiatives should strive for and how these correspond to goals and means in the public sector as a whole. In order to do this I employ a sustainability perspective.

The aim of this thesis is to understand how eGovernance can be sustainable in such a complex organizational environment. This is approached in four papers; based on two case studies, situated in the public sector of Sweden, and a structured literature review of the use of the sustainability concept in eGovernance research.

The findings of this thesis include a framework of sustainable eGovernance, including an outline of the different dimensions of sustainability: social, economic, environmental and technical. These dimensions are seen as carriers of different values and goals which are in a process of continuous dialogue and conflict. Cutting across these four dimensions are two themes: decision making and information infrastructure, which make up the backbone of how ICT can be used in order to improve public practice. The theoretical lens of sustainability widens our understanding and helps in the questioning of motivations, directions and implications of eGovernance initiatives. This thesis thus contributes with a theoretically and empirically founded framework, which is suitable as a foundation for sustainable eGovernance development and further research into that area.

Keywords: eGovernance, Public sector ICT, Sustainability, Complexity, Dialogue of values

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List of papers

Paper I

Paper II

Paper III

Paper IV
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Table of Contents

1. INTRODUCTION .............................................................................. 13
  1.1 Integration and interoperability ..................................................... 13
  1.2 eGov as in eGovernance ............................................................... 15
  1.3 We need to talk about sustainability ............................................. 17
  1.4 Research problem and research question ..................................... 19
  1.5 Structure of the cover paper ....................................................... 22

2. THEORIES AND FRAMEWORKS ..................................................... 23
  2.1 Governance .................................................................................. 25
  2.2 Enterprise Architecture and interoperability ............................... 27
  2.3 Actor-Network Theory ................................................................. 29
  2.4 eGov interoperability maturity, benefits and issues ..................... 30
  2.5 Architectural metaphors – analyzing viewpoints of EA ............... 32
  2.6 Sustainability ............................................................................... 33

3. RESEARCH APPROACH AND METHOD ........................................ 36
  3.1 Interpretive research approach and case studies ........................... 36
    3.1.1 Selection of case studies ....................................................... 38
  3.2 Overview of the research process ............................................... 40
  3.3 Methods for the two case studies ............................................... 42
    3.3.1 Data collection - interviews ................................................... 43
    3.3.2 Analysis of interviews ......................................................... 44
    3.3.3 Interviews case study 1 - local & regional level ..................... 45
    3.3.4 Analysis for case study 1 - local & regional level ................... 46
    3.3.5 Interviews case study 1 - national and regional level ............. 47
    3.3.6 Analysis case study 1 - national and regional level ............... 49
    3.3.7 Interviews case study 2 ......................................................... 49
    3.3.8 Analysis case study 2 ............................................................ 51
    3.3.9 Observations, presentations and informal contacts ................ 51
    3.3.10 Documents ........................................................................... 52
  3.4 Validation and feedback of results in different outlets ................. 52
  3.5 Method for the literature review ................................................. 53
    3.5.1 Analysis framework: sustainability dimensions ...................... 55
  3.6 Method reflection and limitations .............................................. 56
  3.7 Ethical considerations of my research ........................................ 58

4. DESCRIPTION OF CASE STUDIES AND CONTEXT ....................... 60
  4.1 Overview of public administration in Sweden ............................ 60
1. Introduction

eGovernment (eGov), commonly defined as “the use of ICTs [Information and Communication Technologies], especially the internet, as a tool to achieve better government” (OECD, 2003) is a contemporary phenomenon in practice as well as a cross-disciplinary research field. eGov research is being conducted within several research disciplines including Information Systems (IS) and political science. It is within this research field, and particularly on the IS side, that this thesis is situated.

In this introduction, I will first discuss a central issue in the eGov field: interoperability and integration as a means to strive for better public practice. I then go on to highlight the governance concept, and introduce the need to talk about eGov as governance rather than government. Following this, I will outline issues in contemporary research, including the need for a perspective that can deal with eGovernance complexity and dynamics as a means to strive for sustainability. The research problem, research questions and structure of the cover paper of this thesis are then outlined.

1.1 Integration and interoperability

A central question of this research field is how ICT can be used in order to achieve better public services, or to transform the public sector. This proposed transformation is linked to aspects such as increased transparency and flexibility, as well as trust and citizen participation (Bannister & Connolly, 2012). In order to strive for a better public sector, eGov practice and research efforts have, so far, largely focused on whole-of-government integration. Plans for such changes have been formulated and many government sectors are struggling with implementing them (de Brí, 2009; H. Scholl & Klischewski, 2007). Interoperability is closely linked with the use of ICT to move towards a more integrated public sector; a pivotal aspect of this is how organizations are able to work together across departments and between different levels of government (Charalabidis, Lampathaki, & Askounis, 2009; Scholl et al., 2012). This transformation is not only a technical one, but also requires changes in ways of working (Grönlund, 2010); in other words, the way in which day-to-day business is carried out. Working with interoperability and integration is thus challenging as it involves a vast number of actors who have to work together across organizational borders. Somehow, they have to agree on a common vision of the future (Ebrahim & Irani, 2005; Weerakkody, Janssen, & Hjort-Madsen, 2007), or a more systematic vision of the organization as a whole (Chow-
dhury, Butler, & Clarke, 2007). Essentially, the overall goal of interoperability initiatives is to make the public sector better in several fundamental ways, by using ICT in order to cooperate, avoid redundancy and make it easier for citizens, businesses and public sector actors to perform their daily tasks. These initiatives have as their goal a sensible use of technical and economic resources, as well as the improvement of the livelihood of citizens; in other words, they strive towards sustainable public practices.

Such initiatives are not easily implemented, however, as they involve the changing and governing of an information infrastructure in a coordinated way. Information infrastructure has been broadly defined as: “a large, shared, open, standardized and heterogeneous networks of socio-technical actors“ (Janssen & Nielsen, 2005), and ”a shared, evolving, heterogeneous installed base of IT capabilities among a set of user communities based on open and/or standardized interfaces. Such an information infrastructure, when appropriated by a community of users offers a shared resource for delivering and using information services in a (set of) community.” (Hanseth & Lyytinen, 2004). In other words, an information infrastructure is a technical and social framework within which a set of organizations or other actors work in relation to each other. It incorporates a vast number of actors in a vast number of organizations, and includes technologies (hardware and software), regulations, standards and organizational aspects. It also incorporates a time aspect, because it is constantly evolving, and a conflict aspect, as the actors are heterogeneous rather than homogeneous. An information infrastructure is considered to include both ICT and “business” aspects, such as jurisdiction and work practices, which need to function together.

Enterprise Architecture (EA) is a contemporary paradigm concerning how the alignment of technical and business resources should be planned and performed in order to improve public sector practice. EA has been described as a perspective on how to view and plan the development of information infrastructure (Janssen & Hjort-Madsen, 2007). It is intended to provide an overview of a set of organizations that strive to be able to interoperate. It can be described as “the organizing logic for applications, data, and infrastructure technologies”, which is defined in different kinds of policies and guidelines. Hence, it makes up a framework or basic template by which the practices of an enterprise can be improved. These can range from the use of ICT by parts of an organization to ICT used by a group of organizations (Hjort-Madsen & Pries-Heje, 2009). Thus, the aim of EA is to provide a framework for aligning all business and ICT re-
sources in the enterprise so as to improve practice, making it more efficient by aligning all resources towards a common goal. EA has been used with varying success in the public sector, often with several issues and failures (Ebrahim & Irani, 2005; Weerakkody et al., 2007; Venkatraman, et al., 2008). Despite these concerns for the public sector, EA is central to how interoperability and integration is perceived. However, in practice, collaboration takes place among a large number of different actors. It has been shown that “Collaborative undertakings of this kind in government are different from those in the private sector, in particular, for their inherently higher degrees of complexity” which is “rooted in the multi-jurisdictional and non-hierarchical settings, in which these projects are carried out.” (Scholl et al., 2012). It is important to highlight these complexities in order to understand eGov interoperability and integration efforts. They relate to the ways in which different levels of government, as well as other actors, are involved in the implementation and planning of ICT use in the public sector. This is referred to as eGovernance rather than eGovernment.

1.2 eGov as in eGovernance

The complexities of working with large-scale and cross-departmental initiatives can best be approached by adopting a governance perspective. The concept of governance focuses on the dynamics and complexity of public sector practices by acknowledging the importance of actors both inside and outside the public sector; these actors are influential in public services and policy making. This concept is connected to third generation policy studies, where the focus is on dynamic processes of interpretation and re-interpretation of meanings in policy initiatives. Here, the interaction between top and bottom is highlighted as important (Barret & Hill, 1984; Rainey, 1990), as distinct from a sole focus on central government or local bureaucrats.

Hill (2013) argued that the conceptual “move” from government to governance is a suitable way to describe public practice, because it highlights the actions of people involved in the social processes associated with policymaking and implementation. Such people include civil servants and administrators, as well as national politicians, who are also performers of political actions and thus take part in governance (Hill, 2013, p. 9). A governance perspective acknowledges the “ambiguities and complexities of reality arising from multiple actors, interests, and goals” (Hardy & Williams, 2008). A large number of actors are potentially involved in poli-
cy making and governance, including public sector institutions and, increasingly, private actors and supra-national institutions, such as the European Union (EU). This needs to be taken into consideration in order to understand public practice (Bache & Flinders, 2004; Hedlund & Montin, 2009; Olsson, Åström, & Ilshammar, 2006). Public and private actors are included in the planning and execution of public duties. Network approaches are often employed where several public and private actors cooperate across traditional borders (Hedlund & Montin, 2009; Sorensen & Torfing, 2009) and with overlapping policy initiatives (Hill & Hupe, 2009). Management and leadership are challenging in such networks, which have to be governed in very different ways compared with traditional bureaucratic structures. They are often rather loose initiatives, which have little or no decision making power (Hedlund & Montin, 2009). Hence, perceiving public practice as governance raises the question of the extent to which a government can be said to govern a country (Pierre & Peters, 2000).

Although eGovernment is still the most commonly used word to describe the research field, eGovernance is a more appropriate term to describe what is really going on. Government is only one actor out of the many that provide the necessary technical, informational and institutional infrastructures, and specific services. Although, in many ways, government is the central actor, public sector ICT efforts must be complemented by, and aligned and integrated with, other actors, such as businesses and civil society organizations, and indeed the citizens themselves. Hence, a large number of different interests take part in shaping the policy and governance of public practice. This multi-actor, multi-policy, dynamic and conflict-filled setting has to be borne in mind when looking at public sector planning and the use of ICT. Hence, from a governance perspective, the claims of transformation towards “better government” through ICT are not without its problems. It remains an issue as to whether or not the move towards these goals is actually something than can, will or even should happen, because of the various interests involved.

What it means to improve the public sector through the use of ICT is far from clear. Furthermore, different ways of approaching this issue can have different implications. For example: “Despite a popular tendency to assume the existence of a “best” form, many different forms of ICT-enabled governance are possible, and each will have attendant priorities, costs, benefits, and consequences” (Dawes, 2008). Instead of trying to chase “the best” form of eGov we should look to different values and
(potentially conflicting) logic. Dawes (2009) outlined an open, dynamic, socio-technical system in which eGov takes place. Six challenges are specified: societal trends, changing technologies, the purposes and role of government, interaction and complexity, information management and human elements. These aspects all influence public sector planning and the way in which ICT use evolves. Dawes (2009) went on to argue that, in order to understand eGov, we need to take a future-oriented perspective.

1.3 We need to talk about sustainability

The need to look into the long-term viability of eGov is apparent. Over a decade ago, Heeks joked that:

“These days you cannot find the elephants’ graveyard because it is hidden behind the ICT projects’ graveyard where the bleached boards of thousands of PCs lie rotting. Considerations of sustainability must therefore be high on the agenda in planning e-governance initiatives” (Heeks, 2001).

This statement offers a humorous take on the subject, but is nonetheless still very much relevant. As we have seen, the complexities of working with interoperability and integration mean that it is not a simple matter; rather, it is a large and complex endeavor that involves many processes and a large number of actors. Thus, the sustainability of eGov is problematic, for instance because many initiatives still fail, involving a substantial waste of economic resources and manpower. Sustainability is also problematic because of the complexity involved in eGov. Indeed, it is not at all clear as to what sustainability actually means in this context. But what can we, as researchers, do about it?

Bannister and Connolly (2012) pointed out that eGov research does not ask the fundamental questions; rather, it focuses on electronic services (eServices) for citizens and business, adopting the latest technologies and benchmarking development as happening in a pre-defined direction, i.e., as one that moves towards more interoperability and greater integration. A fundamental question that should be posed by eGov research is, therefore, not about how to become more integrated and interoperable, but which purposes that interoperation and integration serve, and the issues of when and where they are actually needed. Yildiz (2012) argued that a key issue in eGov research is the lack of theory. A great deal of the research undertaken applies different versions of stage models or benchmarking tools; however, such frameworks do not support the raising of bigger questions. This is problematic, because eGov “is not just a socio-technical
issue, it is highly political, with its deals, side-processes and negotiations among multiple policy actors” (Yıldız, 2012) which interact in decision making, planning and implementation (ibid). Hence, as highlighted by the governance perspective, it is important to consider complexity and conflict when carrying out research in the public sector, because eGov efforts are, in fact, highly political, and the directions in which such initiatives move cannot be taken for granted.

Others have highlighted several issues with eGov practice and research. The motivations for eGov initiatives are often narrow. For instance, it has been shown that motivations for shared services are mostly based on economic arguments (Paagman, Tate, & Furtmueller, 2013). Furthermore, in a literature review of eGov research it was shown that the foremost focus of research is “concerned with the managerial and economic aspects of adopting and deploying ICT in the public sector” (Cordella & Bonina, 2012), whilst more fundamental questions are largely ignored (ibid). The authors argued that new public management ideals have strongly shaped the field and that there is now a need for more research that considers the public value created by the actions of the government as this would “be a useful counterweight to the rhetoric of progress, modernization, transformative ICTs and new public management that has shaped public management practices over the last 20 years” (Cordella & Bonina, 2012). In other words, there is a clear need for eGov research to focus on fundamental questions. Bannister and Connolly (2014) strengthen this argument. They looked into the relationship of ICT and transformational government, and outline a typology of public values that are likely to be affected by ICT. From this, they were able to conclude that: “Examination of the critical transformational impact of ICT, namely its effect on public sector values, has been neglected” (Bannister & Connolly, 2014). Such neglect is problematic. Public sector transformation that is driven by ICT cannot automatically be taken for granted as positive; ICT might transform some of these values in some areas, but not in others. Hence, many assumptions exist with regard to the contribution of ICT use to the public sector and these need further research (Bannister & Connolly, 2014).

Clearly, what is needed from research are studies that address two aspects: fundamental or “big” questions relating to eGov, and the complexities and dynamics of eGov. Both aspects relate to the issue of how, if at all, different initiatives contribute to a better public sector in the long run. This matter also relates to how far eGov initiatives might also be prob-
lematic; in other words, whether and how public sector planning and use of ICT is, in fact, sustainable.

1.4 Research problem and research question

As shown in the previous section the sustainability of eGov is a central issue for research, one that has not been thoroughly investigated. But what is sustainability?

Sustainability has become established as a central concept for public debate and as a mainstream idea in policy on all levels (Blewitt, 2008). A canonical definition of sustainability outlines the concept as “development which meets the needs of current generations without compromising the ability of future generations to meet their own needs” (WECD, 1987). This broad concept has, however, been operationalized in many different ways (Faber, Jorna, & Van Engelen, 2005). In terms of eGov, the concept of sustainability has been used in research as well as practice. For instance, the European Union’s eGovernment Action Plan for 2011 to 2015 states as its overarching goals that the EU should be “using ICT and enabling organisational changes to deliver better, less intrusive, more sustainable and faster public services, by reducing the administrative burden, improving organisational processes and promoting a sustainable low carbon economy” (European Commission, 2010). What sustainable means in this plan is, however, not clear. This is also the case with other uses of the concept, leading to problems because it can refer to a vast amount of different things (Faber et al., 2005).

In eGov research, the sustainability concept has not been discussed to any great extent, despite its central position in the public sector. In recent publications, however, sustainability has been highlighted as a suitable way to look at the full spectrum of eGov (Lessa, Belachew, & Anteneh, 2011). It acts as a counterpart to solely focusing on eGov success (R. Klischewski & Lessa, 2012), because solutions need to be sustainable in order to succeed in the long run. The link between eGov research and sustainable development research has also been shown to be weak (Estevez & Janowski, 2013). In developing countries, eGov has also been analyzed in terms of sustainability (Dzhusupova, Janowski, Ojo, & Estevez, 2011). However, while these papers include numerous important issues, no common frame of reference exists, and an elaboration on the meaning of sustainability in eGov is still needed.

As eGov today mainly relates to the connecting and integrating of government in terms of making it increasingly interoperable, the role of eGov
as a means to strive towards “better government” also needs to incorporate a future-oriented perspective in which the dynamics of government and society become highly relevant. In other words, the struggle for “better” also includes the ability to survive huge and sometimes rapid changes in many fundamental social, technical, environmental and economic areas. Furthermore, such an approach also needs to highlight eGov not as unequivocally positive but as potentially negative and problematic in terms of which public values can actually be supported or improved. This corresponds both to the need for discussing fundamental questions (Bannister & Connolly, 2014), and the need to include more theory in order to move beyond the focus on benchmarking (Yıldız, 2012). Hence, this thesis is a building block in the eGov research field. It takes a theoretical and empirical approach to investigate how and if eGov can be sustainable.

A lack of understanding of how eGov can be sustainable in a complex organizational environment with multiple actors and changing technologies means that there is a need to look at eGov practices as well as the concept of sustainability. In order to do so, we must look at eGov from an empirical perspective; in particular, looking at interoperability and integration efforts where attempts have been made to align business and ICT towards more sustainable practices. Furthermore, there is also a need for a better understanding of the sustainability concept and how it could be used to direct eGov. Hence, the research question of this thesis is:

_How can eGovernance be sustainable in a complex organizational environment?_

The research question is divided into four sub-questions. These sub-questions are presented chronologically, and have emerged throughout the research process. Each question is represented by one paper in this thesis.

First of all, there is a need to understand the complexity and dynamics of contemporary eGov initiatives. For example, interoperability and integration efforts that employ an EA approach need to be studied in order to understand how different actors interact in the governance of such initiatives (i.e., policy making and implementation), and how these initiatives evolve during implementation. The first sub-question is;

1) How does Enterprise Architecture evolve during implementation?
This question is approached by studying a local and regional level implementation of a national EA initiative. This allows us to understand how different actors make sense of the goals and plans for implementing this architecture. In this context, “evolve” refers to how actors’ views of the plans and structures change in the implementation process, thus affecting what is actually implemented.

The second sub-question digs deeper into how different actors’ interpretations of the benefits of interoperability affect coordination when implementing an EA;

2) How do differing interpretations of interoperability benefits affect coordination in the early stages of implementing a public Enterprise Architecture?

Questions 1 and 2 focus on understanding EA governance. The other two questions focus on applying a sustainability perspective in order to relate the findings to the fundamental questions of eGov sustainability. In order to do so, I first give an overview how sustainability is treated in eGov research, by asking the two-part question;

3) How is sustainability treated in eGov research, and how can the concept of sustainability be incorporated into eGov research?

This question is followed by an empirical application of the sustainability perspective:

4) How can current eGov practice be interpreted from a sustainability perspective?

The research process of this thesis has been emergent, meaning that the research focus - the use of the sustainability concept as a means to understand eGov - has emerged. Hence, the research questions are formulated in ways that highlight different theoretical and empirical aspects.

The research process comprises two case studies and one literature review. The first case study is treated in research questions 1) and 2), with a focus on the implementation of a national EA program. The first case study highlights the need to understand eGov interoperability and integration efforts from a future-oriented perspective, because the complexities involved in eGov stretch far into the future. Hence, a sustainability per-
perspective was employed, and a review of the use of the sustainability concept in eGov research was performed, resulting in a framework for sustainable eGov (research question 3), which was tested empirically in a second case study (research question 4).

1.5 Structure of the cover paper

In chapter 2, the different theories and frameworks used as tools to understand eGov are discussed. In chapter 3, the research process and methods are presented, including two case studies and a literature review. In chapter 4, the case study context is described. In chapter 5, the four papers are summarized. In chapter 6, the sustainability perspective of the thesis is presented, including an overview of the concept and its theoretical foundations. I also present the framework of sustainable eGov that was developed in this thesis and compare it with other frameworks related to eGov and sustainability. In chapter 7, I discuss the meaning and use of the sustainability concept as a tool for understanding eGov complexity from a future-oriented perspective, where the two dimensions of information infrastructure and decision making are central. In chapter 8, the conclusions with regards to the overall research question are presented and the implications, contributions and needs for future research are discussed.
2. Theories and frameworks

In this thesis, several theories and frameworks have been employed in order to perform empirical research, literature reviews and analysis. The theories and frameworks are used for different purposes and are on different levels of abstraction. The overall theoretical framing is governance theory. Other theories and frameworks are used as tools at various steps in the process leading up to the use of sustainability theory, which is central to the contribution made by this thesis. Figure 1 provides an overview of the theories and frameworks used.

The research was performed using two case studies and a literature review, where different lenses were used in order to understand eGov practices with regard to planning, integration and interoperation. Case study 1 used the framings of Enterprise Architecture (EA) and Actor Network Theory (ANT) to understand the development of a large interoperability program. Case study 2 used the sustainability concept as a means to more generally understand eGov from a future-oriented perspective; in other words, how well ICT initiatives, and their governance, are suited to sus-
tainable public practices. This perspective was first elaborated in a literature review, performed after case study 1 was carried out. The main theoretical framing for the entire thesis is governance theory, which relates to how a large number of actors, within and without government, can work together to maintain society’s functions; in other words, how the public sector and society are continuously being organized and re-organized.

From an eGovernance perspective, my specific focus is on the governance of information resources and processes. In this setting, governance includes the planning and implementation processes that together lead to the emergence of information infrastructure across both geographical and administrative borders, through the coordination and cooperation of a vast number of different actors. A common framework for such infrastructure efforts is Enterprise Architecture (EA), which was used as a tool for analyzing the interoperability efforts in case study 1 (the National Patient Summary - NPS). The focus of the case was the alignment of business and ICT. I studied this case while it was happening, and not in retrospect; thus, it was important to follow the various actors closely and consider not just what they had already done but also what visions and plans they had for the future. Actor Network Theory (Latour, 2005; Law, 1992) was used as the guiding framework, with a focus on analyzing episodes. The output of the first part of the case study is paper 1. To a large extent, local events that took place in order to implement the NPS ensued from national interoperability plans. Consequently, they had to be studied in relation to the national context, as well as coordination between regions (further discussed in chapter 4, where the case study context is described). A framework that specifically focuses on interoperability maturity (Gottschalk, 2009) was chosen for the second part of case study 1 in order to highlight national- and regional-level interoperability efforts. It was also combined with the value drivers from the eGovernment Economics Project (Codagnone & Boccardelli, 2006), in order to highlight the values expressed in relation to interoperability work. The output of this is paper 2. An analysis of case study 1 was then performed in its entirety with the help of the architectural metaphors (Smolander, 2002), models, and concepts (CIOC, 1999, 2007a) used to highlight how different actors interpreted the interoperability work. This overall analysis was published in a licentiate thesis (Larsson, 2011c).

The analysis showed that the problematic issues in the case had to do with not being able to plan holistically – across the large number of government entities involved – and for the future. In order to understand
these issues, a new operational framework was needed. The choice fell to the sustainability concept as it is future-oriented, holistic and able to cater for conflicting dimensions, thus fitting well with a governance perspective.

I conducted a literature review of the use of the sustainability concept in eGov research (published as paper 3). The study showed that the concept was often used arbitrarily and that a common frame of reference for the field was missing. Selective literature reviews had been performed, but none with such a wide coverage. To fill this gap, I elaborated a framework based on sustainability theory in combination with sustainability issues found in the eGov literature. This framework was then used in a second case study. The purpose of this case study was threefold: to test the framework on national strategic eGov practice, to understand how eGov research could be performed from a sustainability perspective, and to test if it would be beneficial as a tool to understanding eGov complexity.

The remainder of this chapter presents the theories and frameworks. As Figure 1 shows, multiple theories and frameworks were used in the first case study. However, case study 2 and the literature review relied more on governance and sustainability theory.

### 2.1 Governance

The main theoretical framing of this thesis is governance, which is the basic view of the phenomenon under study. The governance perspective is defined as covering the complex and multi-faceted processes of decision making in a network of actors, both public and private. The term eGovernance was coined to incorporate the dynamics of technology in the traditional governance concept, which traditionally deals with politics and institutional aspects (Åström & Olsson, 2006). Contemporary eGov research highlights the need to consider the dynamic and complex relationships that shape the directions taken by public sector ICT use (Bannister & Connolly, 2012; Dawes, 2009). Hence, my decision to frame this thesis in terms of governance was motivated by the need to acknowledge the complex interactions involved in public sector planning and the use of ICT, which includes multiple actors both inside and outside the public sector.

The governance concept focuses on dynamics and complexity in the public sector by acknowledging the importance of actors both inside and outside the public sector, particularly their influence in public services and policy making. This is connected to what is called third generation policy studies, where the focus is on the dynamic processes of interpretation and
re-interpretation of meanings in policy initiatives; at the top level, this involves interaction between national government actors, and at the bottom level, actors such as civil servants (Barret & Hill, 1984; Rainey, 1990). This is in contrast to a sole focus on central government or local actors. The governance concept acknowledges the “ambiguities and complexities of reality arising from multiple actors, interests, and goals” (Hardy & Williams, 2011). A large number of actors are potentially involved in policy making and governance. These actors are not necessarily within the public sector, but can also be outside it. Thus, we need to take into consideration the sheer number of actors in the public sector, as well as the increasing involvement of private actors and supra-national institutions, such as the European Union (EU), and governance networks with little or no decision making capacity (Hedlund & Montin, 2009). As both public and private actors are included in the planning and execution of public duties, network approaches are often employed, where several public and private actors cooperate across traditional borders (Sorensen & Torfing, 2009). However, within such networks, management or leadership are often challenging because they have to be governed in very different ways to traditional bureaucratic structures. They are often rather loose initiatives and, consequently, have little or no decision making power (Hedlund & Montin, 2009). Perceiving public practice in this way raises the question of the extent to which a government can be said to govern a country; indeed, this is a central question in governance research (Pierre & Peters, 2000). Thus, to an increasing extent, the different interests influence how the public sector operates, and decisions are made across multiple levels of government, from local to international (Bache & Flinders, 2004; Olsson et al., 2006). Furthermore, interactions across government levels and organizations involve multiple policy initiatives that might overlap or conflict (Hill & Hupe, 2009). Such complexity acknowledges that it is empirically and theoretically hard to distinguish a public sector. This motivates the conceptual “move” from government to governance as a means of describing public practice. It also shows that the actions of people involved in the social process around policy implementation, such as civil servants and administrators, and private actors, are in fact also performers of political actions, as they take part in governance (Hill, 2013, p. 9).

The governance perspective has been central to the research process of this thesis. Governance is the framework in which eGov takes place. The addition of an “e” does not, however, mean that ICT is just added. Tech-
nology can change the preconditions for governance considerably by opening up new ways of participation or new ways of working between and across organizations. This means that my research needed to consider complexity and dynamic relationships among several actors, rather than be delimited to one pre-defined group of actors.

The governance concept is relevant to the case studies in this thesis, because the complexity that is essential to the concept also lies at the heart of integration efforts. These contain multiple interpretations and wills that pull and push in different directions. This is in contrast to a sole focus on national agendas or high-level efforts; indeed, multiplicity and complexity are seen as central. Interoperability and information infrastructure efforts involve a vast array of different actors and organizations, all of which have different goals and decision making structures. Hence, using governance theory as a framework for studying these processes serves to highlight the innately political nature of such initiatives.

2.2 Enterprise Architecture and interoperability

A central part of contemporary eGov is interoperability and integration. The general concern is to coordinate national information infrastructure so as to facilitate the increasing amount of interaction among several actors. Such infrastructures are perceived as evolving dynamically through changing relationships and the decisions of a multitude of involved actors (Cordella, 2010; A. Janssen & Nielsen, 2005). From a governance perspective, decision making that aims at directing the development of information infrastructure in the public sector is thus highly interesting.

As discussed in the introduction, different approaches have been used in order to steer the emergence of infrastructure in a desired direction, with Enterprise Architectures (EA) being increasingly popular (Doucet, Gøtze, Saha, & Bernard, 2008; R. Klischewski & Abubakr, 2010; T. Tamm, Seddon, P.B., Shanks, G., and Reynolds, P, 2011). EA has been described as a perspective on how to view and plan the development of information infrastructures (M. Janssen & Hjort-Madsen, 2007). It is intended to provide an overview of an organization or set of organizations that strive to be able to interoperate, and can be described as “the organizing logic for applications, data, and infrastructure technologies”, which is defined in different kinds of policies and guidelines. Hence, it makes up a framework in which ICT can be used to improve the practice of an enterprise, comprising an organization, a set of organizational departments or multiple organizations (Hjort-Madsen & Pries-Heje, 2009). EA approaches are
thus being used as a governance tools for ICT and business. For instance in the USA, the Federal Enterprise Architecture Approach is used in order to provide "principles and standards for how business, information, and technology architectures should be developed across the Federal Government so they can be used consistently at various levels of scope within and between agencies, as well as with external stakeholders” (CIOC, 2012).

EA is thus highly relevant to contemporary interoperability and integration efforts in the public sector, which incorporate a large number of actors in governance processes. EA is thus useful as a frame of reference for analyzing these efforts in order to highlight goals, processes and issues in the struggle to align business and ICT. In this thesis, the implementation of architecture is perceived as a series of evolving and fragmented social productions. As described by Hjort-Madsen (2007), coordinated actions do not necessarily occur in such a complex context.

EA aims to align business processes and goals with the applications and systems used by developing a comprehensive description of the enterprise, which consists of all relevant components (including hardware, software and various aspects of business) and the relations between them (Guijarro, 2009). As an approach, EA includes the processes, systems and strategies used to align ICT and business from a goal-oriented strategic perspective. The overall benefits that are thought to be delivered by EA can be summarized as: organizational alignment (a common understanding of goals and the commitment to achieving them); information availability (correct information available to decision makers); resource complementarity (coordinated use of shared organizational resources); and resource portfolio optimization (leveraging existing and new resources to target performance gaps, and minimizing duplicated resources) (Tamm et al. 2011a; Tamm et al. 2011b). Hjort-Madsen similarly described EA as focusing on: strategy and business orientation (leveraging through ICT); planning (target oriented, based on corporate standards); synergies (re-use and systematic planning of resources); adaptability (dynamic and scalable IS); transparency (clear relations between building blocks); and communication between ICT and business (Hjort-Madsen, 2009).

Essentially; EA is a means to strive for as well as to govern interoperability efforts. In order to illustrate the core of EA, I chose to use a high-level part of an EA framework: the Performance Reference Model (PRM) from the Federal Enterprise architecture (FEA). FEA has been defined by Sessions (2007) as one of the most common EA frameworks. With FEA, it is to possible to analyze gaps and opportunities in the inter-organizational
use of ICT. This is done through the use of different reference models, focusing on different aspects of the enterprise. The Performance Reference Model (PRM) is a central part, focusing on how different parts of the enterprise are aligned with regards to overall goals (CIOC, 1999, 2007a, 2007b). I used the FEA PRM model to analyze EA as a governance tool. The FEA PRM was chosen because it provides a framework for describing how, on a high level, different parts of the architecture are intended to be aligned towards a common strategic outcome.

The FEA PRM is structured in three layers: (1) outcomes, such as the strategic or intended outcomes of an EA, and business results; (2) outputs, such as the processes and activities practiced on a daily basis, and (3) inputs in the form of people (sometimes referred to as human capital), technology, and other fixed assets (such as finances). The initial planning of an EA starts with strategic outcomes and aims to align other aspects in order to support those outcomes (CIOC 1999). In order to structure the presentation of work with interoperability, the framework was useful in showing how different parts of the architecture, and incremental changes in these, are related to the overall goals of the program.

The framework was suitable as the case dealt with high-level goals and the implementation, taking place on a local and regional level. I did not need to go into the technical details, nor did I need to describe the entire process, because my intention was to understand the work being done to interpret the EA plans. The FEA PRM, with its strategy-oriented focus, was suitable for structuring such a high-level overview. Thus, I decided to use the FEA PRM to structure an analysis of the case, and better understand the issues, benefits and goals in relation to the different levels of EA. This also served as a tool to analyze and clarify how differing interpretations of the architecture (as discussed with regard to the metaphors in section 2.5) occurred in complex interactions.

2.3 Actor-Network Theory

Case study 1 consists of two parts: one investigation of the implementation at the local and regional government levels and one at the strategic national level. In the first part, the analysis was structured according to the Actor-Network Theory (ANT) (Latour, 2005; Law, 1992) and episodes of project implementation, in which important events transpired (Cho, Mathiassen, & Nilsson, 2008). These frameworks were used in order to focus the analysis on important actors and events in the case.
ANT was also used in order to structure the analysis for the whole of case study 1.

The first part of case study 1 focused on the local and regional implementation of a national interoperability program. The purpose of this was to understand the evolving interactions in EA implementation in the public sector. In so doing, different departments, projects, organizations and technologies were seen to be important. For the analysis of the whole of case study 1, the purpose was to understand how EA evolved during implementation, with regard to the interactions between different actors. Hence, ANT was used as a tool to focus on the interactions in governance processes, as well as to identify the important actors.

ANT was chosen as a suitable approach for studying EA and the emergence of information infrastructures as they “need to adapt, interconnect, co-evolve — in short, integrate with other systems — in ways that are poorly understood in research” (Chen et al., 2009). The study of IS in general and interoperability efforts in particular can benefit from an ANT perspective. For example, Braa and Vidgen argued that ANT is useful because of its “even-handed treatment of the social and the technological” (Braa & Vidgen, 1999). ANT has also been shown to correspond well with studying and analyzing eGov project processes (Heeks & Stanforth, 2007), infrastructures in general (Cordella, 2010), and complex standardization efforts in the public sector (Hanseth, Jacucci, Grisot, & Aane, 2006). The latter is due to its emphasis on enrolment practices (getting actors “on board”) and the interrelatedness of technology and society. In this thesis, ANT was used to emphasize the interactions between various actors, taking into account how these affected implementation by perceiving relations between the actors as processes of interactive effects (Law, 1992). This is helpful in the study of conflicts, changes and interactions, allowing for understanding of dynamics in the implementation of interoperability. ANT was also used to emphasize the interactions between these various actors and take into account how they shaped the implementation, and thus play a part in how EA evolved. ANT was suitable because it offers a theoretical basis for analyzing relations between the actors as processes of interaction between technology, individuals, organizations and policies (Law, 1992).

2.4 eGov interoperability maturity, benefits and issues

In the national and regional part of case study 1, two frameworks were used together for analysis. The primary one was a model for interoperabil-
The model was used in order to focus on the benefits and issues of interoperability that were highlighted by actors in the case, so as to outline which aspects were relevant in the early stages of EA implementation. In order to categorize the findings, I also used a complementary framework to classify the kinds of benefits and issues treated during implementation. The eGep (eGovernment Economics Project) model provides a framework for achieving a comprehensive theory-based measurement of eGov (Codagnone & Boccardelli, 2006) and was used as it has been proposed as being suitable for developing a deepened theoretical understanding of eGov (Grönlund, 2010). The frameworks are first described, and then I go on to discuss briefly how they were used.

The eGep has three value drivers: 1) financial & organizational (cashable gains, employee empowerment, improved IT architecture); 2) political (transparency, accountability, participation); and 3) constituency (reduced administrative burden, inclusive services, user value) (Codagnone & Boccardelli, 2006). The model has a strong emphasis on measurability (e.g., the number of services, number of service users, etc.); thus, it risks losing an in-depth understanding of complex issues (Grönlund, 2010). In my studies, only the value dimensions (and not the measurement tools) were used, as the focus was on understanding rather than measuring development. The framework has also been criticized for potentially lacking the ability to determine actual progress (Grönlund, 2010). Hence, I combined it with Gottschalk’s framework for interoperability maturity levels. The framework consists of five interoperability levels: 1) computer – semantic and technical issues, 2) process – linking of work processes and information exchange, 3) knowledge - IT-enabled knowledge sharing and cooperation among employees from different organizations, 4) value – combining processes and knowledge sharing to create value by changing practice, and 5) goal – ensuring that no conflicting goals exist between the cooperating organizations. The framework is intended to outline the development of interoperability over time, towards a goal of interoperability. Gottschalk also suggested adding aspects to the model and looking into, for instance, the role of management, legal issues, organizational culture and benefits, as well as the role of technology at each stage (Gottschalk, 2009). Hence, the value drivers from the eGep model represent the perceived benefits.

In this study, however, I found out that interoperability work did not correspond well with the stages in the model; rather, it dealt with a multitude of issues, where a vast majority of discussions concerned goal-
interoperability. This illustrated how interoperability efforts need to deal with conflicts regarding common goals early on in the governance of interoperability. The issues of incompatible and conflicting goals are central in this thesis; indeed, they are discussed further, from a sustainability perspective, in chapters 6 and 7.

After the second part of the case study had been completed, an analysis of case study 1 was performed in its entirety, in order to better understand the governance issues on local, regional and national levels and the dynamics that exist between them.

2.5 Architectural metaphors – analyzing viewpoints of EA

In the two parts of case study 1, the findings were structured according to episodes and levels of interoperability maturity, as discussed above. The first part employed the FEA PRM as a means of highlighting which parts of the EA that were being treated. In order to understand both parts of the case study together, an analysis of the whole case study was performed. This analysis was conducted by using ANT, and was structured according to the Performance Reference Model from the Federal Enterprise Architecture (FEA PRM) (CIOC, 1999), and a framework for architectural metaphors. These two frameworks were used together in order to analyze which aspects of an EA that were treated, as well as how different actors interpreted and used the architecture plans, from the viewpoints of different metaphors. The FEA PRM has already been described above, so I will now move on to describe the architectural metaphors framework.

In order to structure an analysis of this complex setting I chose a theoretical framework in which architecture is treated from different metaphorical perspectives. Walsham has previously highlighted that “metaphors provide interesting ways of ‘reading’ organizations as part of an interpretive epistemology” (G. Walsham, 1993). Meneklis and Douligeris (2010) suggested the use of the Smolander (2002) framework for architectural metaphors as a way of understanding interoperability work in eGov, in particular. The framework is appropriate as a way of highlighting how architectural implementation happens in interactions between actors with varying and conflicting interests. From this perspective, architectures can be perceived in different ways depending on who is using them (Smolander, 2002; Smolander, Rossi, & Purao, 2008). The metaphors were first published in 2002. In 2008, an extended conceptualization of the metaphors was added. These metaphors are: **blueprint** - a detailed guide for implementation concerned with the future state; **language** - a high-level
view of architecture, concerned with the present as well as the future state; *decision* - a management view to guide forthcoming decisions; and *literature* - a specification of the past that is intended to pass on knowledge over time, should others wish to upgrade the architecture at a later stage.

These metaphors were used as a tool to highlight differing interpretations of architectures, and how they are used as a way to communicate, as a “shared boundary object” (Smolander et al., 2008). This framework can be contrasted with that put forward by Zachman, in which the different architectural levels relate to different perspectives on the same architecture (Zachman, 1987, 2008). Smolander’s metaphors are more general and oriented towards use in research. Smolander et al. (2008) argued that architecture metaphors can be used in research to be better able to analyze the concept of architecture, and the way in which they are used to cross boundaries between actors. Such thinking is in line with the perspective which sees eGov as dynamic and complex. By analyzing architecture as something that can be interpreted and used differently by different actors, implementation is acknowledged as being full of conflict. In this analysis, the use of architecture metaphors also offered an opportunity to investigate the formulation of an architecture, rather than just see how it is implemented as a “blueprint”. This is something that has been highlighted as being central to the study of architectures (Tamm et al., 2011)

Thus, metaphors were used in order to analyze different perceptions of architectures in interoperability implementation, and to support the analysis of different enrolment practices and issues with these. The metaphors were used as complementary to ANT, as a way of classifying the perspectives that actors take when enacting EA in interoperability implementation. Hence, the metaphor concept helped to analyze complexities in the governance processes, brought on by different interpretations of what the architecture was, how it should be used and what the goals of the interoperability program were.

### 2.6 Sustainability

On completion of case study 1, the insight that had emerged was that in order to understand eGov it was necessary to look to public sector practice as a whole, rather than focusing on individual projects, because problems cut across administrative borders.

Clearly the complexities involved in eGov need to be studied not only in terms of isolated efforts, but as a long-term and evolving process. Previous research has shown that eGov needs to be considered as existing in a com-
plex organizational environment. Models that conceptualize eGov development as well-defined stages towards common goals clearly have problems. Instead there is a need to acknowledge that development is dynamic. It is influenced by external actors and the choices they make do not necessarily correspond with a pre-defined path of development (Dawes, 2008). In order to perceive eGov as existing in a complex organizational environment, there is a need for future-oriented research (Dawes, 2009).

A future-oriented perspective on eGov requires a suitable framing for understanding the issues first highlighted in case 1. Several of the problems experienced by the actors were due to a lack of common understanding about the direction and evolution of eGov. The concept of sustainability relates to the extent to which today’s practices are, or can become, viable in the long run. Sustainability theory focuses on the interrelatedness of social, economic and environmental aspects, and is often discussed in terms of the triple bottom line (TBL) (Slaper & Hall, 2011), where the key ideal is that all three aspects need to be harmonized in order for something to be sustainable. However, later conceptualizations of sustainability have problematized the view of different perspectives as commensurable. It has been argued that these perspectives are conflicting, and that sustainability is defined in social interactions. Different actors thus are in a continuous dialogue of values, which cannot necessarily reach a consensus (Ratner, 2004). Sustainability theory has also moved towards treating sustainability not as an end state or goal, but as a continuous process. In this process, no definitive good exists; rather, it is contextually dependent and evolves over time (Faber et al., 2005). In this sense the values and goals of sustainability are seen as contingent and socially constructed. They differ according to evolving scientific discoveries and arguments. Hence, sustainability theory incorporates complexity and conflict, which fits well with the governance perspective. Also, since sustainability is by its very definition long-term, it fits well with the need for a future-oriented perspective on eGov.

Other researchers have begun to explore the sustainability concept as a means to consider eGov, not only from a contemporary perspective but also in terms of the long-term viability of eGov (Dzhusupova et al., 2011; Estevez & Janowski, 2013; R. Klischewski & Lessa, 2012). However, a theoretical base of sustainable eGov is still lacking, as is a thorough overview of how the concept has been applied in research. Hence, I looked into sustainability theory and designed a general framework for analyzing the literature, based on sustainability theory as consisting of social, economic, environmental and technical factors, as well as necessarily being
dynamic in the sense that no common goals exist. I then conducted a literature review of the use of the sustainability concept in the eGov field. The review revealed that, whilst sustainability was mentioned in several papers, it was seldom well defined. A framework for sustainable eGov was lacking, as well as a real dialogue of the issues involved. Consequently, I decided to go forward by using the issues raised in the literature review, highlighting a number of factors that were discussed in eGov research with regard to sustainability. Taking these factors into consideration, the framework was then used as a means to perform case study 2. The aim was to: 1) test the contribution of sustainability as a framework for analyzing eGov research and 2) investigate the extent to which sustainability issues in eGov research corresponded to those raised in practice.
3. Research approach and method

This thesis comprises two case studies and a literature review. These are divided into four papers. Each of these papers contributes to the thesis’s overall research question, which has emerged throughout the research process. The context of the case studies is presented in chapter 4, and the content of the papers is summarized in chapter 5 of this thesis. The papers can be found in full after the cover paper. This section focuses on the overall research approach and research process. Also included is the methods used for the case studies and the literature review.

3.1 Interpretive research approach and case studies

In this section, I present the qualitative and interpretive research approach employed in this thesis.

The complexity of eGov was highlighted in the introduction. In particular, eGov is a heterogeneous setting with a multitude of involved organizations, technologies and policies. Heterogeneity is thus central to this thesis, both ontologically (i.e., concerning how the world is perceived), and epistemologically (i.e., concerning the possibility of gaining knowledge from the empirical world). Reality is seen as socially constructed. From this perspective, there is a need to understand a phenomenon in relation to its context, as the two are seen as mutually affecting (G. Walsham, 1993). Interpretive research is socially constructed, a term that has been defined by Orlikowski and Baroudi as, “reality, as well as our knowledge thereof, are social products and hence incapable of being understood independent of the social actors (including the researchers) that construct and make sense of that reality” (Orlikowski & Baroudi, 1991). Interpretive research thus aims to create meaningful understanding of this reality by highlighting multiple interpretations (Klein and Meyers, 1999). At the core of my research approach is the acknowledgement of the assumption that research is about constructing an understanding of reality in relation between researcher and informant. Ontologically, this means that there is no objective reality; rather, it is continuously interpreted and co-constructed. The epistemological assumption is that knowledge of these realities cannot be acquired through any objective means; instead, research is interpretation, albeit transparent and well-founded interpretation.

In conducting interpretive IS research, Klein and Meyers (1999) suggested seven principles as a basis for well-founded interpretation. These principles are: 1) the fundamental principle of the hermeneutic circle,
which is the core principle in interpretive research. It relies on the view
that it is vital to “circulate” between understanding the parts and the
whole. This also means allowing the understanding of a phenomenon to
emerge, rather than having a set view. Stemming from this core principle
are the other principles, namely; 2) contextualization - being aware of the
social and historical background in which the research object is situated;
3) interaction between researcher and subjects - acknowledging that there
are no neutral facts to be found, but that the findings are being construct-
ed in the interaction between researcher and informant; 4) abstraction and
generalization - not only summarizing or giving detailed descriptions of
events or views, but elevating them by the use of theory and previous re-
search; 5) dialogic reasoning - being open to potential conflict or contra-
dictions between theoretical assumptions and the findings. This also
means being open to revising the theoretical framing, as described in the
previous chapter; 6) multiple interpretations - finding different voices and
not just listening to strong actors as they might tell different stories and
have different views of the world; and 7) suspicion - questioning one’s
own assumptions as well as those expressed in interviews.

These seven principles are not criteria that all need to be fulfilled. In-
stead, they should be seen as guidelines on which to base the planning and
performing of interpretive research in IS. I applied these seven principles
in order to guide my research in three ways: 1) by being open to changes
and having an emergent research design; 2) by applying methods that al-
low for interpretation, dialogue and being critical to my own assumptions,
as well as the views of involved informants; 3) by applying different
frameworks and theories, and contrasting empirical findings with conte m-
porary research. These points require some clarification.

Emergent research design implies “an ongoing reassessment of how to
conduct the research based on what has been learned from prior data col-
lection and analysis” (Morgan, 2008). This means that I started out with
some idea as to what to look at, who to talk to and the phenomenon to be
studied. These preconceptions and the focus were then continuously re-
assessed and adapted. This also implies the need for methods that enable
me to remain open to finding new aspects, and refining and revising as-
sumptions and theoretical framings. What this means is elaborated
throughout this chapter. At the end of the chapter, I return to the seven
principles, to provide a summary of my methodological choices I relation
to these.
In order to carry out research that provides well-founded interpretations of eGov complexity I chose case studies as my main empirical approach. Klein and Meyers argued for the usefulness of case studies as a key methodological approach to interpretive research, because “our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools and other artifacts” (Klein & Myers, 1999). Relating to this statement is their argument that a main methodological task is to provide a plausible account for a phenomenon, in that it provides a coherent narrative in which several informants are allowed to speak (Klein & Myers, 1999). This relates to the openness required for an emergent approach. Such an approach allows for openness in order to enable a meaningful understanding of a case by relying on the account of multiple sources (data triangulation) and getting a rich understanding of how the parts (differing individual accounts and interpretations, specific documents and the case, itself) relate to the bigger picture. In order to do so I combined different approaches to selecting interviewees and different empirical sources (Bryman, 2004). These are: semi-structured interviews, observations and document analyses (described in section 3.3).

A seminal article on the use of case studies in IS research stated that single case studies should mainly be used for theory testing (Benbasat, Goldstein, & Mead, 1987). However, Walsham argued that single cases can also generate theoretical generalizations (Walsham, 1995). This does not mean they result in a grand theory or the development of a full idea of causal relations in phenomena; however, findings from one case can still provide relevant insights. Furthermore, Walsham argued that the researcher should avoid “using the theory in a rigid way which stifles potential new issues and avenues of exploration. It is desirable in interpretative studies to preserve a considerable degree of openness to the field data, and a willingness to modify initial assumptions and theories” (Walsham, 1995). The emergent aspect is thus at the core of interpretive studies, as it aims to be open to the creation of new understanding, and not just test or affirm established theory. The selection of cases is described below.

3.1.1 Selection of case studies
This thesis includes two case studies situated in the context of Swedish eGov practice. Case study 1 took place in the Swedish healthcare sector, focusing on a large interoperability project. This case study was conducted in two parts; the first part focused more on the local and regional level,
and the second part more on the national level and relations between regions (although it did involve local actors as well). Case study 2 had a wider focus on Swedish eGov practice as a whole, incorporating national, regional and local actors.

As discussed above, a case study approach is suitable as a means for understanding a phenomenon in context. The reason why two case studies were selected, rather than just one, was because of the need to include more perspectives. Whilst the first case study focused on a program as well as a project within it, the second case study had a wider focus. Thus, there is a need to clarify how these cases are connected, and what motivated their selection. Case study 1 was suitable as it provided an opportunity to understand interoperability work in the public sector, by studying an EA program in the healthcare sector. Healthcare in Sweden is largely publicly funded and the organizations run by local and regional government. The practice that was studied in this case was a good example of how local, regional and national government actors deal with interoperability issues. The focus was on governance practices, rather than the healthcare practice, the clinical setting and hospitals. In the second part of case study 1, the focus was broadened to incorporate regional and national levels of the healthcare sector. Case study 2 was intentionally broadened further in order to incorporate Swedish eGov practice as a whole, including but not limited to the healthcare sector. This case was selected in order to bring light to several of the governance issues raised in case study 1 from the perspective of the public sector as a whole. In hindsight, it is evident that both cases complement each other, and combining them enabled me to create a meaningful understanding of Swedish eGov practice.

Hence, the selection of the cases was carried out in an emergent manner; the first part of case study 1 focused on the local and regional context, while the second part broadened the scope, as the wider context was of great importance even to the local implementation, and thus needed to be studied further. The findings from case study 1 highlighted the need to focus on eGov practice from a high-level and dynamic perspective. This led to the literature review (in paper 3) in which a framework was outlined. Here, a sustainability perspective was used to take an even more high-level approach to understanding eGov. Hence, case study 2 required a wider scope in order to encompass a broad selection of actors who had insight into practices on different levels of practice, plans and policy.
3.2 Overview of the research process

The research process that resulted in this thesis took place from September 2008 to May 2014. This research has been performed as part of my employment in the research school of public affairs (FOVU – Forskarskolan Öffentlig Verksamhet i Utveckling) at Örebro University. The research school was launched in August 2008 with 10 new PhD students in informatics, political science, business administration and economics, and was mainly funded by the City of Örebro. The research school did not have a strict agenda, but the PhD students (me included) were funded to carry out research of relevance to the public sector. The value of “academic freedom” was highly regarded, pointing to the need for research to remain free from funding bias.

Once enrolled in this research school I was given access to a project that had just started in Örebro municipality. It is this project that became the first of the two case studies in this thesis. This case study was (as discussed in the previous section) suitable as an example of the complexity of eGov and interoperability.

The first part of case study 1 was performed with a focus on an interoperability project that was tied to a national EA program in the healthcare sector. It became evident that what was most meaningful in the case related to the national program, which led to a broadening of the focus for the second part of the case study. These two parts are presented in papers 1 and 2, respectively. On completion of the case study, the case was analyzed in its entirety. This analysis lead to the affirmation that a perspective that could incorporate complexities as well as long-term aspects was needed to further the understanding of eGov. Thus, I turned to the concept of sustainability. Paper 3 is a literature review of how the concept has been used in eGov research. Paper 4 applied a framework, which was developed in this literature review, to case study 2.

During the process, I have published three papers and submitted a fourth (under review at the time of writing). However, the papers are only a few of the outputs in this process. I have also presented, evaluated, discussed and validated my preliminary findings in different forums, including academic conferences and workshops, and practitioner events.

Table 1 gives a summary of the research process used, including the research questions, outputs and methods involved, the data that has been used and the theoretical basis for each paper. The table provides a summary of the research process. In the next section, the different methods applied in the case studies are presented.
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<th>Table 1. Summary of the research process (continued on next page)</th>
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<td><strong>2008-2010</strong></td>
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<tr>
<td><strong>Research question</strong></td>
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</table>
### 3.3 Methods for the two case studies

The empirical base of the thesis is comprised of two case studies. The operational method for the case studies is not described in detail here; instead, I refer to papers 1, 2 and 4, accordingly. For paper 3, a structured method for literature review was used.

How the the interviews and analysis was conducted differed slightly for each part, although the general approach was the same. In this section I first briefly describe the general approach (in sections 3.3.1 and 3.3.2) before going on to present the specifics of each part.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Future-oriented eGovernance: The sustainability concept in eGov research, and ways forward.” Published in Government Information Quarterly (Larsson &amp; Grönlund, 2014) Published in Government Information Quarterly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outlets</th>
<th>Draft version and/or tentative findings presented at: Network meeting for Swedish network on eGovernment research (Gävle) 2010-05-25; Municipality of Örebro 2010-10-11; Research school reference group with representatives from public sector organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preliminary findings presented to Örebro municipality; Paper presented at 10th IFIP 8.5 International conference, EGOV 2011 (Delft, Netherlands)</td>
</tr>
<tr>
<td></td>
<td>Preliminary findings and/or draft version presented at: Centre for Technology in Government (Albany, USA) 2012-11-01; Scandinavian Workshop on eGovernment - SWEG (Oslo, Norway) 2013-02-05. Tentative findings presented for Swedish Association of Local Authorities and Regions - SALAR (Stockholm, Sweden) 2013-04-11.</td>
</tr>
<tr>
<td></td>
<td>Preliminary findings presented to the Swedish Association of Local Authorities and Regions - SALAR (Stockholm, Sweden) 2013-04-11. (Same presentation as mentioned with regard to paper 3).</td>
</tr>
</tbody>
</table>
3.3.1 Data collection - interviews

In both cases, interviews have been the main empirical material. A total of 46 interviews were performed, in person as well as by telephone. All interviews were semi-structured; some were wide ranging whilst others referred to a more refined set of questions. Hence, the execution of the interviews varied in order to better learn from the interviewed informants.

Interviews were chosen as the main method for this thesis because of the fact that the involved actors are heterogeneous and because an interpretive approach requires flexibility and scoping (Myers & Newman, 2007). When carrying out interviews in interpretive case studies it is important to strive for a “dialectic between the understanding of the text as a whole and the interpretation of its parts” (Harvey & Myers, 1994). The essential idea is to analyze the parts and the whole in iterations in order to capture the interdependency of these aspects and how they form a phenomenon.

By performing interviews from an interpretive perspective, I also acknowledged that the interview situation requires me to be both attentive and engaged, because interviews are “an occasion for producing situated and morally adequate accounts” (Schultze & Avital, 2011). This means that I saw myself as an active participant in a dialogue with the informants, where we both took part in the emergence of meaningful insights and interpretations.

The interviews were semi-structured, meaning that I had prepared questions and/or themes about which I was interested in getting further insight. This also means that I was able to improvise in terms of asking new questions, skipping questions and letting the actors speak more freely about what they considered to be of importance in relation to the questions posed. Each interview ended by giving the actor the opportunity to speak more freely and comment or ask questions about the research or anything else raised during the interview. All actors were informed of my general research area of interest, and were also given the opportunity to ask more questions about this. This was intended as a way of situating me as an equal in a conversation, rather than as someone performing an interrogation. The aim was to make them feel more comfortable by avoiding the feeling of the researcher as being superior to the interviewee. In this sense, the use of language is also important, as is the use of “mirroring questions”, i.e., consciously adopting the interviewed actors’ formulations (Myers & Newman, 2007). Hence, the interview guides I prepared were there to guide me; they were not there to dictate my formulations or the
order of questions. This interview approach is intended to give respect to
the informants own voice or “narrative”, avoiding to steer the informant,
and to instead use the informants’ own experiences as a starting point
(Schultze & Avital, 2011).

3.3.2 Analysis of interviews
The analysis of the interviews differed somewhat between the papers, but
the general approach was the same.

The interviews were analyzed through the coding of statements made by
the informants. Coding was used to label and structure what was being
said by the informants and to move in an emergent way towards understand-
ing their particular statements in relation to statements made by
other informants, and the context (Ayres, 2008; Benaquisto, 2008). The
coding was performed by reading interview transcripts and/or listening
and re-listening to recordings of the interviews. All interviews were ana-
alyzed in this way, although the granularity of codes and exact approach to
coding differed. The coding was not necessarily performed word by word
or line by line; rather it was dealt with in chunks, which could be larger
and smaller. Hence, different codes had different levels of granularity.
Initially the coding was in vivo, staying close to the informants’ own for-
mulations (Benaquisto, 2008). As the analysis progressed, I continuously
re-evaluated the codes used and allowed more general codes to emerge,
resulting in larger themes. This is seen as a process of abstraction, where
the complexity of the interview material is increasingly structured by look-
ing for patterns (Williams, 2008). In practice, this means that, whilst the
initial focus of analysis is on coding and labelling, the process itself is con-
tinuous and moves towards identifying a pattern. Consequently, “it is
difficult to identify the point in the analysis at which thematic coding be-
comes thematic analysis” (Ayres, 2008). I saw this process of abstraction
as a way of interpreting what is meaningful in the cases. Hence, coding
was carried out in an emergent way, with the gradual creation of more
abstract themes. This method can be contrasted with coding that takes
place in strict stages, such as the open and axial coding proposed by
grounded theory proponents (Benaquisto, 2008).

The themes created in this process of coding were also contrasted with
or mapped into different frameworks (as discussed in chapter 2). The goal
was to make sense of statements in relation to their context, and in rela-
tion to previous research. Resting on an interpretive base, the analysis of
interview material was not carried out in order to identify any objective
reality; instead, it was perceived as a constructive practice, where I could interpret, structure and make sense of the analyzed material.

The specific approach to interviews and analysis is presented below. For each section, a summary of the interview guide used is shown in a box, after which the analysis method is presented.

### 3.3.3 Interviews case study 1 - local & regional level

The interviews were performed between June and September 2009. An interview guide was used, with a set of themes to guide the interview, although this allowed for follow-up questions and improvisation (see the box below). The themes treated the actors’ perceptions of the project (e.g., purpose and development over time), her/his role, identification of the central events and actors, and perceptions of issues in the process. The purpose of the questions was to get an insight into what the different informants thought about the project, its purpose, what was going on and the issues involved. The informants were primarily based in the municipality and county council of Örebro (local and regional level) as the project was a first step in the implementation process of a national program. The selection of informants was initially carried out by participating in project meetings, which allowed me to identify actors in central roles in the project on a local and regional level. The first interviews were with the project coordinator and the communications manager. Others were selected by snowball sampling, although efforts were made to interview actors based at various levels of the organization (Myers & Newman, 2007). The informants came from several fields of practice, such as the IT department, project management and healthcare practice. A total of 12 interviews were conducted, of which 11 were at a local and regional level and one was with a national informant; the latter was chosen because several actors saw this actor as playing a central role.

The interview guide for the study is presented in table 2.

---

**Table 2. Interview questions for case study 1 – local & regional level (continued on next page)**

The main purpose of the interviews was to let the respondent define a course of central events, actors, conflicts and so on. The aim was also to get the respondents’ views on specific issues and themes. The questions and structure presented in this document were mainly meant as support for the researcher during the progress of the interviews, and were not followed strictly. Although the approach aimed to discuss most of the questions during each interview, it was still vital that
the respondent was allowed to tell her/his own story. Focus was on the National Patient Summary (NPS) project.

Initially asking the respondent to talk about her view regarding IT in healthcare
How do you perceive IT in healthcare?
What do you think of technology in general?

Asking the respondent to, briefly, talk about previous experiences with IT in healthcare, and other similar projects she might know of.

Asking the respondent to tell about the NPS project, from the beginning to present time.

When did it “start”?
Which were the central events?

Asking the respondent to tell about her/his role in the NPS project.

When did the respondent get involved in the process?
Which do the respondent think are the central actors in the project, locally and nationally?

Describe unexpected events
Describe problems experienced during the process
Describe what has been easy during the process
What conflicts have existed?

Was there much discussion about the implementation of it?
What was the impact of these discussions?
What needed to be established locally – for instance, because it was not defined in the national strategy or other guiding documents?

Describe what you think the goal is for implementing NPS

3.3.4 Analysis for case study 1 - local & regional level

The analyzed material consisted of transcripts from all interviews, who had been voice recorded and transcribed. Analysis was carried out by grouping the informants’ statements into themes categorized according to the subject discussed. The analysis was based on Actor-Network Theory and focused on episodes, i.e., when the stability of a process was challenged, either by the inclusion of new actors or with the occurrence of an event that could trigger change (Cho et al., 2008). The themes were then
related to each other to form episodes. Themes were connected to other themes with regards to how they were connected as processes. The central processes (themes, with actors and events) were considered to be the central episodes. The episodes consist of the parallel processes. These are the result of the analysis of those processes perceived by the informants - the actors who took part in them – to be central, and the outcomes of these processes. The actors were the ones who defined what was interesting by arguing for which events they perceived to be central in the implementation process. The approach aimed to avoid structuring the findings according to any pre-defined categories; rather, it aimed to interpret the actors’ statements and order them in themes created incrementally throughout analysis (Bryman, 2004). Through a process of coding of statements, grouping of codes and reassessing these codes (by returning to earlier interviews and codings), the themes emerged.

3.3.5 Interviews case study 1 - national and regional level
This part of the case study was based on 21 semi-structured interviews. The interviewees were divided into two main parts: national actors and regional actors. The first four interviewees were selected because they are key actors in national-level work with the EA for the healthcare sector. They represent the major organizations involved in the EA program and were: the project leader of a key project, the head of the a coordination group for municipalities (represented by regional spokespersons), the head of the overall organization of ICT in healthcare and one member of the architecture group at the Center for eHealth in Sweden (CeHiS – a national organization). These interviews were performed with the purpose of gaining a deeper understanding of the plans for implementation, gaining access to informants at the regional level, as well as discussing the research design. The first four interviews were also used as a way of refining the interview guide for the forthcoming interviews, so as to understand which questions might help to clarify and understand different perspectives. These interviews were audio recorded and transcribed.

Informants for the forthcoming interviews were selected by recommendations from the national-level actors, using a snowballing technique. In some cases, these actors also recommended other actors who could offer further explanation of the issues involved. These were nine municipality coordinators (local government) and eight county council actors (regional government). Their roles varied and the set included IT professionals as well as CIOs. One of the county council actors was also employed by the
national architecture group. These interviews focused on how different actors worked with the strategy for eHealth on a regional level, as well as the perceived benefits, issues and enablers, and the perceptions of future interoperability work in the healthcare sector. These interviews were performed over the telephone because of the wide geographical spread of the actors. All interviews were audio recorded.

The interview guide for the study is presented in table 3.

**Table 3. Interview questions for case study 1 – national and regional levels**

<table>
<thead>
<tr>
<th>Question</th>
</tr>
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<tbody>
<tr>
<td>These questions were used as a guide for the researcher, but were not necessarily asked in the stated order; nor did all questions have to be asked, as informants often raised them of their own accord. The formulations of the questions were not necessarily as stated in the guide. Follow-up questions were also asked, particularly those that asked for clarification such as “why”, “how”, “when”, “could you tell me more about…”, “were there any difficulties with…” and so on. The focus was on the entire program.</td>
</tr>
<tr>
<td>What is your role in the municipality/county council?</td>
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<tr>
<td>What is your role in national work with eHealth?</td>
</tr>
<tr>
<td>How is coordination handled in your region?</td>
</tr>
<tr>
<td>Between municipalities/municipalities and county council</td>
</tr>
<tr>
<td>How do you work with interoperability between the municipalities and county council in healthcare?</td>
</tr>
<tr>
<td>Do you have computerized patient records? (What kind of records? To what extent?)</td>
</tr>
<tr>
<td>Do you work with terminology?</td>
</tr>
<tr>
<td>Do you work with mapping out joint health care processes?</td>
</tr>
<tr>
<td>(between municipalities/municipality and county council)</td>
</tr>
<tr>
<td>Do you work with defining the values and goals of working with (interoperability in) eHealth?</td>
</tr>
<tr>
<td>(How) do you work with the strategy for eHealth in your region?</td>
</tr>
<tr>
<td>Which of the nationally defined projects do you work with?</td>
</tr>
<tr>
<td>What is the goal of interoperability between in healthcare?</td>
</tr>
<tr>
<td>Do you focus on any specific aspects?</td>
</tr>
<tr>
<td>Which health care processes are to be supported/enabled by the interoperability work you are doing?</td>
</tr>
<tr>
<td>When does information need to be sent?</td>
</tr>
<tr>
<td>What type of information?</td>
</tr>
</tbody>
</table>

(continued on next page)
### 3.3.6 Analysis case study 1 - national and regional level

The analyzed material consisted of transcripts of the first four interviews, as well as voice recordings of the later interviews, which were re-listened to several times. Notes were also taken during interviews as well as during the re-listening of the recordings. For the analysis, a framework of interoperability maturity (Gottschalk, 2009) was used to structure the findings according to the various aspects of interoperability that were treated in the process; for instance, hardware, information exchange and goal interoperability. The intention was not to use the framework to get a snapshot of the implementation, but to highlight how different perceived benefits and challenges are related to each other in the process of interoperability work in the healthcare sector. Hence, the specific challenges and benefits were discussed in relation to the larger context of the healthcare sector as well as eGov as a whole. Thematic analysis was used as a means of grouping statements together, with regard to central issues and the benefits of interoperability work that were raised by the informants. When all themes had been mapped into the framework, an overview of the perceived benefits and issues in the case had been created. These were then analyzed in relation to each other, in order to determine any related themes. The themes from the various levels of the model were then integrated into three overall themes: unclear structures and roles for decision making concerning IT; ambiguities concerning legal foundations and jurisdictions; and problems and enablers when following a set path. These overall themes were used to discuss the findings in context, as the perceived benefits and issues extended across several levels of interoperability.

### 3.3.7 Interviews case study 2

Thirteen semi-structured interviews were conducted, either in person or by telephone. The approach focused on letting the informants raise what they perceived to be important, rather than letting me direct them. The questions revolved around describing the work carried out in their organization, issues that they found to be central and current to eGov practice,
any challenges and plans for the future, and the identification of important actors.

The informants were selected by a combination of hand picking and “snowballing”, focusing on people with a strategic overview of the authorities and coordinative organizations (national level), and municipality representatives (local level). The rather wide selection of informants was intended to provide an insight into the different perspectives of Swedish eGov practice at different levels. This would allow a multiplicity of voices to be heard and avoid seeing issues from a single-sided perspective.

The interview guide is presented in table 4.

Table 4. Interview questions for case study 2

<table>
<thead>
<tr>
<th>These questions were used as a guide for the researcher, but were not necessarily asked in the stated order, nor did all questions have to be asked, as informants often raised them of their own accord. The formulations of the questions were not necessarily as stated in the guide. Follow-up questions were also asked, particularly those that asked for clarification such as “why”, “how”, “when, “could you tell me more about...”, “were there any difficulties with...” and so on. These interviews were more open and improvised than in the previous case study, and many of the follow-up questions were asked. The focus was broad, encompassing public sector ICT use as a whole, thus allowing the informants to define what was important and relevant with regard to purposes and challenges in working with eGov.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Could you tell me about your role in the organization(s) you are employed in? How does your organization work with eGov? What is the purpose of working with eGov? What are the central problems, issues and questions in working with eGov? Planning and long-term thinking: How can work be carried out with regard to “long-term” development/the future? Who are the central actors in/for Swedish eGov? Could you tell me about the relationship between your organization and these actors? Could you tell me how you work within your sector? Could you tell me how you work with other sectors? Who else should I talk to in order to get more insight into eGov practice and what we have discussed?</td>
</tr>
</tbody>
</table>
3.3.8 Analysis case study 2
All interviews were voice recorded. To facilitate analysis they were coded using Atlas.ti, either directly (coded sound files) or after transcription. The initial coding involved labeling key statements made by the informants. At the next stage, codes were aggregated into themes such as decision making, infrastructure and budget. At the final stage, these themes were analyzed to see what relations, if any, there might be between them (for example, “complex decision making regarding infrastructure”, “multiple organizations budgets involved in decision making on infrastructure”). This analysis resulted in three overall themes: theme 1 relates to governance structures and the need for a holistic view of Swedish eGov; theme 2 relates to new forms of cooperation and input from various actors; and theme 3 relates to the emergence of infrastructure. The various aspects of these main themes were then plotted into the framework for eGov sustainability, (developed in paper 3) in order to highlight how sustainability factors that are raised in eGov research are reflected in eGov practice.

3.3.9 Observations, presentations and informal contacts
In order to maintain an element of suspicion and facilitate dialogic reasoning I also used sources other than interviews to get insight into the cases. To this end, I participated in meetings, practitioner conferences as well as other more informal meetings and contacts. These events were not structured in any particular way but were improvised and often initiated when the opportunity arose. These complementary methods aimed at getting better insight into the two cases, as well as being able to get feedback from different stakeholders involved in them. The purpose was to get a broader understanding of the cases, to inform my interpretation of what was meaningful in each case, and in the bigger picture. This understanding was also used as a means to asking more informed interview questions in forthcoming interviews.

For case 1, informal contact was more important, allowing me to stay up to date with regard to developments in the project and the program being studied. For instance, informal meetings were held with project representatives and program champions to keep me informed and to look into the sort of documents I could use. I participated in 12 project meetings and 2 practitioner conferences on healthcare sector ICT work in Sweden. I also had informal conversations in relation to the meetings I observed, which led to some clarifications and “leads” that I could follow up.
on in interviews. During the latter part of the case, I had sporadic email and telephone contact with national project management.

For case 2, continuous contacts and staying up to date were not as important, as I was not following a specific project but rather trying to get an insight into the entire system of Swedish eGov. However, informal contacts still played an important role; initially, I had discussions with an actor who had been involved in an organization central to Swedish eGov practice, who directed me to some of the actors I then interviewed. In turn, they “snowballed” me towards others. I participated in one meeting for regional and local government representatives where I observed what was discussed and, at the end of the day, also briefly presented my early and ongoing research (discussed in section 3.4). Further interviewees were also selected after informal meetings at a Swedish eGov practitioner conference.

3.3.10 Documents
Throughout both case studies, additional empirical material has been gathered, through websites and other documents. Documents were continuously gathered and used as a means of gaining a deeper understanding, to clear up misunderstandings, or look up facts of when certain decisions had been made or policies formulated. Policy documents, websites and other information released by the different informants’ organizations, were used as guidance to understand statements made by the informants. They also enabled me to get a better understanding of which aspects were meaningful in this case, and the way in which informants’ statements related to the bigger picture of the case with regard to policy documents, plans and events. Documents were found in different ways: in case 1 (local and regional level), a large amount of internal project documents were gathered with the help of involved actors, whilst in the national part of case 1 and in case 2 documents were mainly gathered by me by looking at project websites, often as a follow up to informants’ tips during the interviews.

3.4 Validation and feedback of results in different outlets
Throughout the research process I have presented and discussed research in progress and results as a means of validation and re-interpretation. I have done so at several events, involving both researchers and practitioner audiences.
For the first paper, a draft version was presented at a network meeting for Swedish network on eGovernment research (2010-05-25). The audience consisted of practitioners as well as researchers. A later draft version of the paper was also read and commented on by a national-level practitioner related to the case; this led to some clarifications being made with regard to how I had interpreted processes in the case. The preliminary findings of the first and second papers were presented at different stages of the process to practitioners connected with the research school. One presentation was for a reference group with representatives of public sector organizations that is connected with the research school of public affairs. The comments received during these presentations and discussions with practitioners led to some clarifications and re-assessment of my own interpretations of the case. Paper 2 was also presented at the IFIP 8.5 International conference, EGOV 2011 in Delft, mainly to researchers, but also to practitioners.

For the third paper, preliminary findings were presented at the Centre for Technology in Government (Albany, USA) 2012-11-01, where I was a visiting scholar for a month. A draft version of the same paper was later presented at the Scandinavian Workshop on eGovernment - SWEG (Oslo, Norway) 2013-02-05. Both of these presentations allowed me to receive informed comments and criticism from active researchers in the field, and led to clarifications regarding (first and foremost) how the analysis was framed and the implications of the findings.

Preliminary findings for the third and fourth papers were presented to the Swedish Association of Local Authorities and Regions - SALAR (Stockholm, Sweden) 2013-04-11. During this seminar, I participated as an observer, taking notes for case study 2. At the end of the seminar, I was given the opportunity to talk about my previous and ongoing research.

Furthermore, the papers and parts of the analysis have been discussed in seminars at Örebro University, where my results and interpretations have been scrutinized by my academic peers.

3.5 Method for the literature review

The third paper is a literature review. Literature was searched for in the eGovernment reference library (EGRL) version 8.5, published December 15th, 2012, a reference library comprising of 5524 eGov papers from peer-reviewed journals and conferences (Scholl, 2012). The library covers the period from 1981 up until December 2012, and consists of entries from core eGov journals and conferences, wherein the majority of eGov
papers can be found, along with other relevant journal publications, many of which are in the IS field. The library thus covers a vast majority of research relevant to the eGov field. Additional complementary searches were also carried out in order to find sources that may have been missed in the EGRL.

The EGRL was searched using the reference management software EndNote. I searched the library for “sustainable”, “sustainability” and “sustain” being present anywhere in the keywords, abstract or title of the paper. As the focus of the paper is on the sustainability concept specifically, I chose not to include other concepts which may have some relation to sustainability; for example, green IT. This would have required another step in which I would first have had to decide what should be included in my definition of sustainability, something that is not appropriate for a paper that looks to how others define and use the concept. Instead I choose to approach the matter by looking into what kind of research that had been conducted in the eGov field within the frames of using the concept.

In an initial screening of the 96 papers found, 71 were found to be relevant. The range of the included papers was vast, ranging from sustainability as the central concept to sustainability being discussed as one of several aspects. The excluded papers were mainly those that mentioned sustainability without any connection to the core of the paper. Other papers that were excluded discussed the sustainability of the eGov research community, and were considered to be outside the focus of this review as they did not focus on eGov as a phenomenon.

As the EGRL was found not to contain full key words and abstracts for all papers, additional searches were carried out using Scopus (http://www.scopus.com/) and Web of Science/Knowledge (http://apps.webofknowledge.com/), so as not to omit any relevant publications. During this process, 23 additional relevant papers were found. Hence, a total of 94 papers were included in the review. Publications that were not peer-reviewed but were simply project descriptions or reports were not included, as the focus is on eGov research, not practice. Also, some references to books were excluded because sustainability was only referred to in general terms, and no reference to a specific chapter was given.

In the next review step, all papers were read in full, focusing on the use of the sustainability concept, so as to get a contextual understanding of its use and meaning. In some instances where the papers could not be ob-
tained in full text (7 papers out of 94), I had to rely solely on the information provided in the abstract. Overall, the initial reading of the abstract was in most cases sufficient to get a picture of the sustainability focus of the paper. Reading of the full text provided additional details and nuances which would have been missed otherwise, such as to the extent to which the concept was discussed and applied. Hence, it is possible that some missing information in the additional papers might have caused some nuances and clarifications to be missed.

3.5.1 Analysis framework: sustainability dimensions

As a first step, all papers were mapped according to the analysis framework, based on sustainability theory, as described in chapter 2 as well as in subsequent chapters of this thesis. The framework contains four sustainability dimensions: social, economic, environmental and technical. The analysis of sustainability dimensions is exemplified in table 5.

<table>
<thead>
<tr>
<th>Social</th>
<th>Economic</th>
<th>Environmental</th>
<th>Technical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance, Citizen trust, Accountability, Adoption...</td>
<td>Funding, Budget, Shared resources...</td>
<td>Green IT, Carbon footprint, Simulation software for decision support...</td>
<td>Standards, Architectures, Infrastructure, Digital preservation...</td>
</tr>
</tbody>
</table>

This mapping provided an overview of the perspective and focus of each paper. The analysis was carried out with regard to the focus given to certain sustainability aspects. In some cases more than one dimension was treated; in such cases, the papers were put in more than one category, as the categories are not mutually exclusive but are interrelated. For example, in one paper it was stated that ICT capabilities among citizens affected ICT penetration, which would affect the sustainability of a country in terms of both economic and social aspects. Hence, the paper was seen to be related to both social and economic aspects. The issue also has to do with technology (ICT penetration), but as the paper did not discuss the sustainability of ICT itself it was not mapped in the technology category.

I also sought to identify the focus of sustainability in each paper. Most papers stated what was to be made sustainable; however, in some cases this was only defined indirectly and required some interpretation. In this sense the focus can, for instance, be eGov as a whole, as a project, as a community, or as an ICT infrastructure. In a few papers, more than one
focus was identified; for example, the sustainability of the natural environment and the budget of an organization could be issues that are discussed together.

Other than the themes and foci, I also noted the year of publication as well as whether or not the paper was based in sustainability theory. The theoretical grounding was divided into three levels: no definition of the sustainability concept, an operational definition, and a theoretical discussion of the concept. Furthermore, I limited the focus of the review to exclude aspects such as degrees of cross citations, the publication outlets that are used, and disciplines of the authors. As the purpose of the exercise was to understand the use of the concept rather than the prominence of publications in terms of bibliometric measures, I chose to exclude such aspects.

The second part of the analysis focused on creating an outline of the commonalities, i.e., general themes, in terms of what was discussed in relation to sustainability. This part of the analysis intended to respond to such issues as: which of the four sustainability dimensions are covered, and how; and which parts of eGov practice are focused on, and how. The method applied is thematic analysis, where I start out with the creation of initial concepts and then move towards higher levels of abstraction as themes of similar concepts are created (Hansson, 2012).

3.6 Method reflection and limitations

In this section, I will briefly reflect on the method used for the case studies, as well as the overall limitations of the focus and approach of this thesis.

Throughout the research approach and method chapter, I have discussed the different means used in order to perform my case studies. In order to provide an overview of how I strived to provide relevant, valid and meaningful interpretations I refer to the seven principles for conducting and evaluating interpretive field studies put forward by Klein and Myers (1999); these were discussed at the beginning of this chapter. A summary is given in table 6.

Although these principles are not meant to be heuristics for how research ought to be conducted, they are indeed useful in order to plan, guide and evaluate interpretive case studies in IS. Hence, having considered these principles, I am confident that my interpretations are relevant, valid and useful.
### Table 6. My case study methods related to the seven principles of Klein and Myers (1999)

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) The fundamental principle of the hermeneutic circle</td>
<td>The circulation between the parts and the whole has been considered in the analysis of the interviews in each case, being analyzed continuously and contrasted with the case as a whole and with other statements. In this emergent research process the cases also make up smaller parts, which relate to the bigger understanding of both cases, as well as to the eGov research field.</td>
</tr>
<tr>
<td>2) Contextualization</td>
<td>The contextualization of the cases was done by highlighting they are situated in Swedish eGov practice, and accounting for the policy context, the structure of Swedish public practice as well as the history of eGov in Sweden.</td>
</tr>
<tr>
<td>3) Interaction between researcher and subjects</td>
<td>In the descriptions of the interview method and selection of informants I highlight how I have adhered to this by acknowledging the informants as participants in a dialogue during the interviews. They also helped me to choose who to talk to and what is of importance in the case. This was also central to the interview situation, as I viewed it as a dialogue rather than me just asking pre-defined questions.</td>
</tr>
<tr>
<td>4) Abstraction and generalization</td>
<td>I have adhered to this principle by using multiple frameworks and theories (as described in chapter 2), particularly using sustainability and governance theory, as well as previous eGov research that uses the sustainability concept.</td>
</tr>
<tr>
<td>5) Dialogic reasoning</td>
<td>In connection with the previous principle, I have continuously re-assessed the theoretical framings of my research and strived to remain open as to what is relevant in the cases and avoid using theory or frameworks too rigidly, which would have obstructed my interpretations rather than enabled them.</td>
</tr>
<tr>
<td>6) Multiple interpretations</td>
<td>I have continuously aimed to talk to actors in different roles and organizations in order to not only get input from &quot;strong&quot; groups or one-sided responses, but instead to get a rich picture of the cases.</td>
</tr>
<tr>
<td>7) Suspicion</td>
<td>By using multiple sources for gathering empirical material (interviews, observations, documents, etc.), I have aimed to question my own assumptions as well as statements and interpretations made by the informants. Furthermore, by assuring the informants that the interview transcripts would be treated confidentially, I have strived to assure them that they can speak their minds, instead of saying what they feel might be expected of them.</td>
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</table>

The selection of case studies was discussed above, and the selected cases do make suitable examples of eGov practices in terms of interoperability and EA work, as well as strategic planning of ICT use. However, one must also acknowledge that these cases are situated in a particular context, namely, the Swedish public sector. This context is further described in...
chapter 4, and is rather particular in terms of local autonomy as well as a strong public welfare system (including free and publicly funded healthcare). Hence, the findings may not be applicable in all contexts. However, with interpretive research a key aspect is the importance of contextualization, so that the reader can also interpret the cases as well as understand their context. Another issue pertaining to the cases is the time aspect. Although the case studies were performed during a five-year time period, they are nonetheless snapshots. Although the findings from these cases are still valid and relevant, a longer time span could have provided a focus on the dynamic changes over time. However, the time dimension is still manifest in the cases through the informants’ stories.

With regard to the focus of this thesis, and the choices of theories and frameworks (as discussed in chapter 2), the focus could of course have been narrower, wider or focused on different aspects of eGov. In choosing a governance and sustainability frame this research clearly emphasizes the academic rather than the practical side, which is also reflected in my choice of case study approach. If, for instance, more practice-oriented methods, such as action research, had been chosen, the focus could have been placed on making a specific initiative better with regards to the understanding of complexity. I chose to take a more “distant” approach so as to be able to conceptualize the issues involved in eGov interoperability efforts, before moving on to find a suitable theoretical framing.

The above discussion does not directly deal with research ethics, although the seven principles do carry ethical considerations. In the next section, I discuss how I considered ethical considerations in the planning and conduct of my research.

3.7 Ethical considerations of my research

In order to consider and maintain a high ethical standard in my research I have followed the guidelines for social sciences put forward by the Swedish research council. The demands are summarized in terms of four requirements: information, consent, confidentiality and use (Vetenskapsrådet, 2002).

A main ideal for my research is that each interview is carried out on the informants’ terms, respecting the informants when performing interviews and analyzing the results. This means that they should know what they are involved in (information requirement), that the material is not gathered or used without their consent (consent requirement), that it is treated confi-
dentially (confidentiality criteria) and treated as well as published in an ethical way (use requirement).

When requesting an interview with an informant, I contacted them by e-mail (most commonly), by phone, or in person. I then gave them information about the purpose of my interview and, in broad terms, what I would be asking during the interview. Hence, the informants were given the option to agree to an interview, disagree or direct me toward someone else whom they felt would be better suited to take part in such an interview. Prior to each interview (either in person or by telephone, depending on how the interview was to be performed), I also presented more in detail what my research is about, how it will be published and the confidential treatment of any material.

Each interview was voice-recorded with the explicit consent of the informants. They were also informed that they could decline to answer questions (for any reason).

Before quoting any informant I gave them a chance to assess whether or not they felt they were quoted correctly, that my interpretation of their quote (and what I want to illustrate with it) is correct, and whether or not they are willing to be quoted. One informant did not want me to use the quote as it would be too easily identifiable who had said it. Hence, I chose to withdraw the statement from the paper manuscript to respect the informants’ privacy. Other examples include discussions with informants regarding my interpretations of their statement, which in some cases led to discussions regarding my interpretation of the statements, and thus to clarifications. Thus, I have ensured fair use of the gathered material.
4. Description of case studies and context

In order to understand the results, it is necessary to give a brief introduction of Swedish public administration and a brief overview of the development and policies of Swedish eGov in general (where both case studies take place) and the healthcare sector in particular (where case 1 is situated).

4.1 Overview of public administration in Sweden

Elections for the Riksdag, the national legislative body of Sweden, as well as regional and local level government bodies are held every fourth year. National public administration also consists of ministries, which handle areas of practice, such as environmental issues and national defense. There are also authorities that work on a broad variety of issues, mainly at a national level; for instance, international development aid, traffic and aviation and retirement funding. The 290 municipalities at local level government have a high degree of autonomy and have responsibility for a large number of different tasks, including schools, waste management, water supply and home-care for the elderly. Sweden also consists of 20 county councils and regions, which are regional governments that are mainly responsible for healthcare. On a national level, authorities and government administrative departments are also autonomous from the ministries. Joint decision making between any of these actors is carried out through discussions and negotiations. The tradition of autonomy is strong and practices are very much similar to, and influenced by, new public management (NPM), a management paradigm that emphasizes the need for decentralization of, and competition between, public sector organizations (Dunleavy et al., 2005). Hence, national level government has a limited say over local and regional government.

4.2 Policy context of Swedish eGovernance

Initiatives regarding ICT in the Swedish public sector are fundamentally influenced by the decentralized system of autonomous local governments. Since the first efforts were made in 1995, several initiatives have been launched, all designed to coordinate autonomous actors rather than to direct them. For instance, the 24/7 Delegation (24-timmarsmyndighet) was active between 2003 and 2009, partially setting the agenda for how authorities should become easily accessible to citizens online. At the same time, the eCommittee (E-nämnden) focused on standards and secure i-
formation exchange. Between 2006 and 2008 the tasks of these and other leading national actors were assembled into one single organization, VERVA (Authority for administrative development in government), which comprised legal, technical and organizational competencies and was charged with the task of developing a modern public management with ICT at its heart. By the end of 2008, the authority was terminated and the responsibilities were scattered across other organizations.

Regarding the governance of ICT in the public sector, VERVA was charged with the task of coordinating the development towards interoperability. It concluded that a national EA approach (aligning technology and business aspects across the whole of Sweden) was not possible because of the high level of municipal autonomy in Sweden, as well as the fact that several authorities already had a well-defined EA. Thus, in order to create an interoperable public sector, only the necessary parts were to be coordinated, so as to strive for a “desired level” of interoperability, for Sweden as a whole (VERVA, 2007). The coordination of eGov in Sweden was later formulated in an official action plan, which assigned one government authority to lead in each sector (e.g., health care, geographical information and taxes). Each such “development authority” was made responsible for developing e-services for the entire sector, for which other agencies would be users.

The National Action Plan for Swedish eGovernment (Government Offices of Sweden, 2008) was released in 2008. The plan covers the entire public sector, focusing on the creation of an interoperable public sector through a federative model for cooperation that strongly relies on local autonomy. The action plan outlines a sectored approach to the “harmonization” of the public use of ICT. The plan highlights the necessity to use ICT in order to eliminate the duplication of work and increase cooperation between agencies. The strategy covers technological aspects as well as the need for legal reformations to support information exchange and sharing.

The action plan was discussed in a special issue of the International Journal of Public Information Systems (IJPIS, 2009 issue 2), where it was problematized from a number of angles. Some of the central aspects of the different analyzes of the action plan are worth raising here. First, the plan outlined an intended organizational architecture, but focused mainly on the technology architecture and standards (Grönlund, 2009). Furthermore, in the plan’s rhetoric there is an “implicit belief in an unproblematic casual progression from technological innovations to social and administrative
change” (Giritli Nygren, 2009). The plan is also shown to lack a dynamic perspective on the interplay between actors, technology and context. All choices made in eGov are assumed to be rational, and conflicting objectives are not treated (Melin, 2009). The approach to eGov is thus a decentralized one, with governance networks, having little or no decision making power. Furthermore, the view of eGov as something rational and unproblematic was highlighted as a central issue. Clearly, the issues regarding the belief that eGov is progressive, which were highlighted in the introduction of this thesis, are also evident in this plan.

The e-government delegation was created in early 2009. It can be described as an operative organization with the purpose of enabling cooperation between authorities. The delegation consists of members from different authorities and municipalities and has a directorate of employees working to coordinate different parts of practice. The delegation is not an agency in itself, but is under the direction of the Ministry of Enterprise, Energy and Communications. At the time of writing, the e-government delegation is a central actor; however, they are only contracted until 2014. They are directed by committee directives, which describe their purpose.

Other organizations that are central to eGov practice include the eSociety Center (CeSam). CeSam is under the Swedish Association of Local Authorities and Regions (SALAR), which represents regional governments; 20 county councils and regions and local governments; 290 municipalities. Its work is related to the Strategy for the eSociety, which incorporates wider aspects than the e-government delegation.

The Digitalization commission (Digitaliseringskommissionen) was established in 2012 to implement the European digital agenda under the national policy of A Digital agenda for Sweden (Government offices of Sweden, 2012). Its purpose is to incorporate all levels of society, including private and public organizations in digital development. Its general goal is that Sweden should be the best country in the world when it comes to taking advantage of the opportunities provided by digitalization. This is to be done by cooperating with interested parties; for instance, by recruiting self-assigned “signatories” to join in the agenda of working towards using ICT to better society.

The actors and policies discussed above are the central ones in Swedish eGov. However, other policies also exist, such as the government’s strategy for a citizen-centered public administration (Government offices of Sweden 2012). There is also an ICT policy for a greener administration.
(Government offices of Sweden 2010), which relates to environmental aspects of the Swedish authorities’ use of ICT.

4.3 Swedish healthcare interoperability program

The above description gives an overview of the general eGov context in Sweden, although some clarification of the healthcare sector is also necessary, as case 1 is situated in this particular context. Swedish healthcare is, to a large extent, publicly funded as a part of the Swedish public sector. Swedish healthcare is distributed among several care providers. The 290 municipalities are responsible for social services and home care, but also for a vast amount of other services such as schools and waste disposal. Healthcare thus has limited resources and a wide focus. The 20 county councils that are responsible for hospitals and medical care almost exclusively focus on healthcare. Healthcare is also handled by private care providers, although to a lesser extent.

In 2006 the National Strategy for eHealth (Ministry of health and social affairs, 2006) was released, laying the foundation for an EA program. The strategy aimed to improve healthcare by means of interoperability. It was seen as a prerequisite for other quality drivers, such as allowing patients a choice of provider and improving efficiency by allowing different providers to be able to “hook on to” standardized systems. The strategy initially focused on ICT and information exchange between county councils, as the formulation of the strategy was mainly driven by an interest group for the county councils. In 2010 a new strategy was released, which also included the social services sector and, hence, municipalities. Another predominant change was that the focus was now also turned towards practice and benefits rather than technology. Since the launch of the initial strategy, the municipalities had taken a more active position in the program. However, the program was funded by the county councils and thus the municipalities were included to a lesser extent in the development. In 2011 (when the second part of case study 1 was performed), a large part of the municipalities had not accepted or agreed to follow the strategy, in contrast to the county councils. Within the Center for eHealth in Sweden as CeHiS there was a municipal coordination group that served as a forum for representatives for all regions (between 10 and 40 municipalities) to come together and give CeHiS an insight into the municipal perspective. It also aimed to bring knowledge of the national situation back to the municipalities. Under these complex preconditions, it also strived to achieve a more holistic view of the entire program.
In case study 1, I looked specifically at the implementation of the EA in the healthcare sector, as well as at a sub-project that was part of this EA. The project was in focus mainly in the first part of case study 1, since this part of the case study mostly had a local focus. The program as a whole was the subject of the second part of case study 1, mainly focusing national and regional work.

The sub-project under study was the National Patient Summary (NPS). The NPS was defined as an application to allow all connected care providers to take part in the summarizing of information in patient records from other care providers. NPS was defined as a “seek and find” tool, summarizing information fed from several sources and, thus, dependent upon several other applications to function. It was not a patient record per se, as it could not be edited by the user. However, it was supposed to present information from all different electronic health records that were connected to it. From a top management level, it was considered to be the flagship for Swedish healthcare ICT.

The first part of case study 1 studied the first implementation of NPS, which was a test run for the project and central parts of the architecture. It was intended to be a first example of good use of information exchange over caregiver borders. As well as having access to the NPS, the healthcare staff would also benefit from only having to use one single-sign-on to access multiple systems, as the healthcare sector would use a common infrastructure and interconnected systems. This would be achieved by using a secure eCard for identification (discussed further below), rather than having to log into a multitude of systems, as before.

In order to understand the results some additional information is needed with regard to legal changes. Legal reforms were outlined as a precondition for information sharing and the Patient Data Act was accepted in 2008. This law replaced the old Health Records and the Care Registers Act and was intended to enable information sharing over care provider borders, as well as ensure the correct handling of patient information. The Patient Data Act allowed information to be shared between county councils and between a county council and its municipalities. Besides the legal changes, I will use three parts of the architecture as examples in my description of the results. These are:

*Information supply* - The application called BIF (a Swedish abbreviation for “basic information supply”) was intended to function as a hub for the delivery of data between different healthcare applications. BIF covered a number of functions, including: authentication, access restriction (so that
only authorized healthcare staff can log in/access information), logging (registering who had accessed and edited information) and secure patient contact (which is a tool to ensure that the healthcare staff access information on the right patient). From early on in the program, BIF was described as a central part of the infrastructure, indispensable for information security and patient privacy. Hence, it was perceived as a core infrastructural aspect of the architecture.

_Electronic Identification (eID) Card_ - All users (i.e., relevant healthcare and home-care staff, for instance) were to be equipped with an eID card. The purpose of this was to act as a “strong authentication” for determining secure access to information, as well as inhibiting improper use. A core benefit that was highlighted with this was that it would enable users of eCards to log into several systems using only one card and one password, allowing them to electronically sign for journals, prescriptions and so on. By first putting the eCard into a PC eCard reader, the user’s identity would be checked in the registry (through BIF). Users would then receive permission – or a denial – to access the requested information.

_Secure network_ – In order to restrict unauthorized access of information from outside users, the Internet would not be used for information exchange. Instead, the county councils’ network, known as Sjunet, was to be used as the communication network for the healthcare sector. In order to implement the strategy, it was planned that all care givers, municipalities and county councils would be connected to this network. Sjunet was initially created and used by a smaller group of county councils. However, it was given formal status as a part of the infrastructure for healthcare and was included in the architecture.
5. Results

The main research question of this thesis is divided into four sub-questions: 1) How does enterprise architecture evolve during implementation? 2) How do differing interpretations of interoperability benefits affect coordination in the early stages of implementing a public EA? 3) How is sustainability treated in eGov research and how can the concept of sustainability be incorporated into eGov research? 4) How can current eGov practice be interpreted from a sustainability perspective? The questions are approached in papers 1 to 4, accordingly. This chapter focuses on the results from these papers and their part in the emergence of the focus of this thesis: the sustainability concept as a tool to understand the complexity and conflicts of eGov. I also summarize an intermediate analysis of the whole of case 1, which was carried out between papers 2 and 3.

An overview of the papers, the research question and their contribution to the thesis are given in table 7.

<table>
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<th>Paper 1</th>
<th>Paper 2</th>
<th>Paper 3</th>
<th>Paper 4</th>
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<tr>
<td><strong>Research question</strong></td>
<td>How does enterprise architecture evolve during implementation?</td>
<td>How do differing interpretations of interoperability benefits affect coordination in the early stages of implementing a public EA?</td>
<td>How is sustainability treated in eGov research and how can the concept of sustainability be incorporated into eGov research?</td>
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The first two papers concern case study 1, focusing on issues of an interoperability program on a local and regional level (paper 1) and on a national/regional level (paper 2). The focus of these papers is on the concept on Enterprise Architecture and the problem of perceiving eGov as evolving in a series of stages which, as discussed in the introduction to this thesis, is a common way of conceptualizing eGov. From case 1 it became apparent that a new theoretical perspective was needed; my choice fell on the sustainability perspective. Paper 3 approaches the need to understand eGov as eGovernance rather than eGovernment, from a future-oriented perspective. In particular, it discusses the sustainability concept in eGov research. In this paper, I developed a framework that integrates sustainability theory and previous use of the sustainability concept in eGov research. The use of the sustainability concept in research is then contrasted.
with eGov practice in paper 4, where the framework is also tested as a tool to analyze eGov practice.

All four papers approach the complexities of eGov in different ways, as part of the emergent approach to research. This section provides a brief overview of the papers. For a detailed accounts of the results and analysis each paper can be found in full after the cover paper. The connections between the four papers are also explained in this section. The first two papers are seen as an initial problem formulation that led me to adopt the sustainability concept as a tool for understanding eGovernance complexity from a future-oriented perspective.

As seen in the table, the focus of the thesis emerged during the research process. In the remainder of this section the main findings and conclusions of each paper are described. I also describe the intermediate analysis process of case 1, which was carried out between papers 2 and 3.

5.1 Paper 1 – Local & regional level of case study 1

The research question of the paper is: How does enterprise architecture evolve during implementation? Specifically, it focuses on how the structure of the EA program evolved from the planning stages through to implementation in practice. This paper provides an account of how actors on a local and regional level strive to make sense of a national level interoperability initiative. The results of this paper shed light on how the program evolved through interactions between sub-projects and through the mutually affecting relationship between local, regional and national actors (although the latter are focused more in the national and regional part of the case study).

The study shows how priorities were made and then changed incrementally, instead of being part of a prescribed plan for development. As a consequence, some parts of the project, which were initially taken for granted, were re-negotiated during the implementation process. One such example included a new law that had been implemented to allow information exchange to take place across care-provider borders, in order to be able to provide an easy-access overview of individual patients from different medical records in the NPS. However, it became apparent to the involved local actors that the law did in fact make information exchange that had been done manually before illegal; information sharing now required the patients’ explicit consent; however, a large part of patients that were included in this first implementation suffered from various mental
impairments (such as Alzheimer’s and dementia). In a strict legal sense, therefore, they could not give their consent. Thus, a core perceived benefit of sharing information would be inhibited. A motivation to go ahead with the implementation anyway led to tentative solutions that “broke the rules” and challenged laws. These were perceived as high risk, although at the same time they were seen as necessary.

Another example relates to BIF, a secure login and information handling application. This application was intended to be developed as a separate project that ran parallel to the NPS project; the two were supposed to coordinate with each other. This application was initially defined as a technical security requirement for the entire program. The “trial implementation” of NPS was supposed to test the functionality of BIF. However, when it became apparent that BIF could not be delivered on time (even after extended deadlines), a decision was taken to go ahead with the implementation anyway. In this case, completing the implementation project “in time” became the top priority. Consequently, other goals, such as initially prescribed technologies and requirements for patient integrity, were downplayed. The concession was made that they would be dealt with in the future. A central issue in this part of the case study related to how goal conflicts appeared in the program and how these led to negotiations about the actual or intended legal and technical requirements were, or should be. In effect, a central part of the infrastructure was not implemented as planned. Thus, in this process, the architecture was not followed strictly. It was also perceived to be in conflict with the new law. Implementing the architecture required some modifications and reinterpretations and “pushing” the limits of plans and laws.

An overarching theme in the paper is the perceived issue of the project as predominantly being directed from a county council perspective. When municipalities were included in the program at a later stage, they were in a clear minority. Thus, they found it hard to make their voice heard at a national level with regard to the actual requirements; these differed from the county councils’ requirements (who were also involved in the implementation) because of organizational preconditions. The study has also shown how different parts of a larger interoperability program can evolve in different directions, and how different projects in a program can affect, and potentially counteract, each other, which was the case when the BIF project was postponed. This was also the case when the law had to be challenged in order to go ahead with the implementation. As a result, several infrastructural and security aspects were temporarily downplayed.
An overall contribution of the paper is that it shows how changes in the program can be both intentional (for example, program management might perceive that a program should be allowed to evolve) or unintentional (because of differing interpretations of sub-projects, unexpected events, delays, etc.). This case study highlights the issues that arise when an implementation drifts away from a program, and when it evolves within it. A central notion of this paper is that an EA program should be considered neither as a blueprint nor as something that evolves uncontrollably. Instead, an EA program should be seen as something that needs to be planned. However, it should be recognized that it will evolve in order to meet the needs discovered in the process. Thus, a project could evolve in directions not initially intended. The paper thus highlights the dynamic and fluent meanings of architectures, which are further explored in paper 2.

The conclusions of this paper are;

In order to implement an EA, it is necessary to get vital actors and vital technologies on board to support the strategic outcomes. However, actors’ interpretations of goals, technologies and responsibilities differ. Thus, conflicts that challenge the implementation process may occur. In turn, this could lead to the evolution of the EA program into something that differs from the initial implementation plan or even the initial purpose of the EA. However, it is vital to acknowledge that this does not exclude following a plan, as it might very well include priorities that allow for flexibility. Here, four aspects are central:

- EA does not change uncontrollably, but responds to parallel projects that evolve in different directions.
- Changes in projects should not be perceived as them drifting away from plans in an EA, but rather as co-evolving with it.
- Thus, projects to implement parts of an EA need to be aware of and act in accordance with incentives of other projects (and not just the EA program itself) in order not to counteract each other.
- The evolution of EA can be both intentional (as the program management might perceive that a program should be allowed to evolve) or unintentional (due to differing interpretations in sub-projects, unexpected events, delays, etc.).

The central notion is that an EA should be considered neither as a blueprint nor as something that evolves uncontrollably. Instead, an EA program should be seen as something that need to be planned with regard to
that it will, and should, evolve in order to respond to needs discovered in the process. The contribution is a deepened understanding of how sub-projects co-evolve with a national EA program. Thus, projects might evolve in unintended directions, although this should not be perceived as something unequivocally negative. Indeed, it may also be strategic, and lead to the evolution of other parts of the EA to suit each other.

*The paper was published in the Electronic Journal of E-Government* (Larsson, 2011b).

### 5.2 Paper 2 – National & regional level of case study 1

The research question for this paper is: How do differing interpretations of interoperability benefits affect coordination in the early stages of implementing a public EA? It highlights the relations between national and local actors in the implementation of the national strategy for eHealth, a large-scale interoperability initiative. In contrast with the project-specific focus of the first paper, this paper focuses on the different interpretations of the program as a whole. A central theme is the ambiguity that arises from differing interpretations of the goals and means of interoperability.

This study brings into focus the interactive relationship between national, regional and local levels. It does so by highlighting how goals are problematized at a local and regional level and how this affects the program management’s perception of what the architecture “should have been”. It also highlights how some actors, on different levels, perceived that the program should be implemented “as planned”; this was in contrast with the more pragmatic perceptions of the architecture. This sheds light on how the complexities of implementation can lead to cross-breeding perceptions between organizations on different government levels. In this case, the negotiations about what the information infrastructure should look like were negotiated across government levels and organizations. This study has shown how goals expressed in policy documents and architecture specifications can be seen as mandatory by some actors. However, this view might not be shared by all actors, as their interpretations of a technology may differ.

A core example in this case is how standards for the secure use of eID were established in an outline of the architecture, predominantly by county council actors. Several municipal actors, who had only recently had been involved in the program, did however see these standards as problematic. The issues mainly revolved around the argument that municipali-
ties are not focused solely on healthcare and thus cannot justify investing in eID cards that can only be used within the healthcare sector. These cards, it was argued, would be redundant as identification cards in other parts of the municipality, because of different security requirements. This would lead to overlap that could make the working situation worse rather than better for affected employees, who would have to keep multiple eID cards and remember login information for more systems. It would also lead to added costs and time-consuming management.

Another example, with similar issues to the eID card, was the use of the secure network Sjunet. The use of the network was defined in the architecture as a key element for enabling secure communications. However several municipal actors saw the “requirement” for connecting to this network as costly, implausible and redundant. From their perspective, secure information transfer could be done through the Internet, and connecting to this county council network would be a lot of work for nothing.

What was mandatory in the plans became a matter for negotiation. In this process, common frames of reference gained foothold in certain groups, while being resisted by others. Hence, contrasting interpretations concerning goals and means to achieve these goals were raised by several actors. These interpretations were not formed by municipal actors alone, but across all levels. The critical actors thus represented interests from various organizations, both inside and outside of the healthcare sector, because of the dual roles played by several of the involved actors, whose employment were not solely in this sector.

This paper shows how interpretations of the purpose and scope of a program, and the implications it might have on other parts of the public sector, can differ between actors. This can lead to ambiguities about where decisions should be taken, making coordination difficult. For instance, the majority of the discussions were held in governance groups, with actors from different regions each representing a handful or more municipalities. They did not have the mandate to make decisions but had to act as couriers between the discussions held in this coordination group and the discussions held at the local and regional level. In practice, this often meant that they faced the almost intangible task of gathering information about what was going in each region with regard to ICT in healthcare and using this information to form the basis for discussions in the coordination group. They were asked to “bring back home” the issues raised in these discussions so that they could communicate them to “their” municipalities. Each of these municipalities then had to decide what they were going to act
upon. Furthermore, the representatives and communication channels lacked formal connections with bureaucratic and political decision-making structures, which made these network meetings more about keeping up with information than anything else. In the end, decision making relied on each municipal actor getting the support and understanding of various actors “at home”. In relation to these decision-making complexities, several actors saw the architecture more as a basic starting point for discussion; however, others interpreted the architecture as a straightforward plan that should be followed.

This paper also brings into focus the relations between national authorities, as unclear jurisdictions can lead to confusion among local actors. There were ambiguities surrounding jurisdictions between authorities. Several actors stated that it was not clear which authority they should turn to in order to get feedback regarding, for instance, the interpretation of laws. The jurisdictions were not altogether clear, and different authorities sometimes gave different feedback to the regional actors. Both on a national level and a local level, these actors perceived significant gaps with regard to coordination and information about what was going on. They were uncertain as to who actually had the mandate to make certain decisions (if anyone) and where that mandate was held.

From this analysis it also became clear that the maturity model for interoperability that was used provided little support in understanding “where” an organization was placed in the process of developing interoperability. This was because different “stages” were treated simultaneously. In the model, goal-interoperability was proposed as the final stage of interoperability, while the issues central to this case were concerned with goal interoperability from the start. Several of the issues experienced by the actors were not delimited to technology or goals, but were seen as highly interrelated.

The conclusions of this paper are:

- In local and regional EA implementation, interpretations of the purpose and scope of a program, and the implications this may have on other parts of eGov, can differ. This can lead to ambiguities concerning where decisions should be taken, making coordination hard. EA programs do not only need to acknowledge organizational issues and IT; they also need to highlight the relationship with programs in other parts of the public sector, which may overlap.
Conflicts are intrinsic to eGov programs; thus, relations between national authorities need to be taken into consideration. Unclear jurisdictions may cause confusion among local and regional actors. Hence, being upfront about conflicts, and opening up for discussions on how to deal with them, is vital for coordination to take place.

If new organizations get involved in a program, differing goals of program implementation influence the requirements for information infrastructure. Hence, EA programs need to maintain enough flexibility so as to be able to adapt.

Using maturity models that see the development of interoperability as sequential creates an over-simplified picture of implementation. This delimits scientific usefulness, as different “levels” do not follow sequentially. Instead a re-conceptualization of maturity models should be discussed. These models have also been seen by others as being too deterministic and simplified (Coursey & Norris, 2008), a criticism that is strengthened by these findings, as each “stage” cannot be treated separately.

The paper was published in the proceedings for IFIP EGOV 2011 (Larsson, 2011a).

5.3 Summary analysis of case study 1

Each of the two parts of case 1 was analyzed in a paper. An intermediate analysis was then performed in order to analyze the case in its entirety. This analysis was published in a licentiate thesis (Larsson, 2011c).

This analysis showed how, despite a rough outline of interoperability work being created in case 1 before implementation, it still contained conflicts and ambiguities. A great deal of controversy revolved around defining “the enterprise”, because the health care sector was delimited as one unified enterprise in the architecture. This became increasingly problematic during implementation. To a large extent, this concerned municipalities, whose business area stretched much wider than the health care sector; hence, the definition of the enterprise became problematic. Another central aspect was the legal obstacles to cooperation. Here, a new law that had been implemented to allow for information sharing created conflict between the values of efficiency and patient privacy. The legal grounds for
sharing information proved to be problematic, which led to several involved actors perceiving that a large part of the patients in health care could not benefit from interoperability because their information could not be shared. The legal challenges also dampened the enthusiasm for the program as a whole.

The program also outlined a technical architecture before implementation. This architecture was however treated in conflicting ways, both as a blueprint (something that should and would be implemented) and a tool for communication (as a way of initiating discussions on what needed to be implemented and what was possible). For instance, several municipalities perceived that the planned information infrastructure was unsuitable for their business needs, because it did not meet the requirements of other actors in the public sector. Thus, they brought it into question by using it as a tool for communication rather than as a blueprint. Meanwhile, other actors argued that the blueprint had already been decided upon, and thus needed to be implemented. This case also shed light on the use of informal networks outside of traditional bureaucracy to deal with interoperability. Such networks were used in order to align the actions and perceptions of a large number of autonomous municipalities. This revealed issues concerning local decision making; it appeared that knowledge of, and resources for, ICT and architectural work were lacking in several municipalities. Also, as the networks lacked formal power decisions not easily could be taken jointly. In the end, they had to be negotiated locally. This made coordinated decision making hard as the processes were lengthy and often lacked clear incentives. Furthermore, ambiguous feedback from national authorities, as well as an overall lack of understanding among local actors with regard to what was legal in procurement and information sharing, complicated the situation even further.

This analysis resulted in these conclusions:

- The purposes and roles of interoperability between government agencies are assessed differently by different actors with regard to their knowledge of the phenomenon and the level of government they are on.
- The implementation of interoperability should not be seen as a progression towards higher levels of eGov maturity and increasingly integrated public sector; rather, it should be seen as a conflict-filled process. The extent to which a common direction can be fol-
allowed may differ, depending on individual circumstances: for instance, it may vary because of local government autonomy.

- The process of defining which organizations are to be made interoperable, or what is to be considered as “the enterprise”, is a political process. The drawing of “the enterprise’s” boundaries may be filled with conflict, bringing this process into question. Thus, re-negotiations may need to take place during implementation,

- Different perspectives on an enterprise, from different architectural viewpoints, are often described as complementary, and it has previously been shown that different architectural metaphors can be used by different actors during implementation. However, in practice, different use of metaphors for architectures can open up discussion and lead to conflict. These may not only be different; they may also contradict other actors’ use of metaphors, because different metaphors may clash. In other words, Interoperability plans on a central government level can be perceived as decisions that have to be followed, suggested directions, or form the basis for initiating discussions on the purposes of public sector ICT use, and how that ICT should be used.

- Interoperability work may be a novel task for some local governments. Therefore, there is a need for negotiation and the establishment of forms of formal decision making and informal dissemination, because such structures may be lacking. Implementation may be slow because of a lack of understanding about interoperability programs, where IT may be seen as the only factor. In addition, there may be few forums for coordinated decision making, or there may be obstructions in the form of existing formal and legal arrangements.

By and large, the issues outlined in this case related to an inability to plan holistically – across the many government entities involved – and for the future. In order to understand these issues, a new operational framework was needed. The insight that had emerged was that, in order to understand eGov, it was necessary to look to public sector practice as a whole, rather than focusing on one project, because the problems seen in case 1 cut across bureaucratic borders. Many of the problems experienced by the actors were due to a lack of common understanding and direction.
of where and how the evolution of eGov was heading. Clearly, the complexities involved in eGov needed to be studied not only in terms of isolated efforts, but as a long term and evolving process. In order to deal with these issues a future-oriented perspective was needed.

Other researchers have started to explore the use of the concept of sustainability as a means to consider eGov not only from a contemporary perspective but also to consider the long-term viability of eGov (Dzhusupova et al., 2011; Estevez & Janowski, 2013; R. Klischewski & Lessa, 2012). The concept incorporates complexity and conflict (Faber et al., 2005; Ratner, 2004), as well as a long-term focus. Thus, I found the sustainability concept to be particularly suitable for discussing eGov from a future-oriented perspective. However, a theoretical base for sustainable eGov was lacking. Hence, I looked into sustainability theory and designed a general framework consisting of social, economic, environmental and technical factors, as well as a perspective that sees sustainability as dynamic and conflict-oriented. I then performed a literature review of the use of the sustainability concept in the eGov field (in paper 3), as shown below.

5.4 Paper 3 – Sustainability as a new theoretical lens for eGovernance

Paper 3 concerns the two-part research question: How is sustainability treated in eGov research and how can the concept of sustainability be incorporated into eGov research? The definitions and elements of sustainability are discussed, ranging from the canonical Bruntland Commission’s definition, to contemporary definitions, in which sustainability is seen not as a goal, but as a process with contested and conflicting goals. This concept is further discussed in chapter 6 of this thesis.

The main focus of the paper is a structured review of eGov literature. In this review, eGov research is categorized according to the extent that various sustainability areas (social, economic, environmental and technical) are addressed. Twenty-one overall themes from 94 papers were identified, as discussed in detail in the methods chapter and, again, in chapter 4. Social category themes were raised most by papers; in this area, governance aspects are especially prominent.

The social themes were: 1) needs and participation; 2) politics and governance; 3) evaluation, analysis and measurements; 4) values, goals and policies 5) future uncertainty; 6) regulations, trust and security; and 7) holistic view of organization and technology.
The economic themes were: 1) cooperation, security and control; 2) feasible plan and model; 3) stakeholders and citizens; 4) alignment of the social and technical; and 5) decision making and information.

The environmental themes were: 1) decision making and information; 2) infrastructure and energy; 3) environmental strategy; and 4) environment as an important value for eGov.

The technical themes were: 1) standards and interoperability; 2) information preservation over generations; 3) holistic view; and 4) technical infrastructure.

A core finding of the analysis of the themes raised in previous research was that the two cross-cutting themes to which the 21 overall themes relate were: decision making and infrastructure (which, in this cover paper, is more correctly referred to as information infrastructure). These have been elaborated in paper 4 as well as in chapter 6 and 7 of this cover paper.

The findings also show that sustainability in eGov research has mostly been addressed from a narrow perspective, focusing on projects rather than general issues. Furthermore, it has tended to address it rather shallowly, with a focus on single factors, rather than the complex interaction between these factors, and with little foundation in sustainability theory. This paper contributes with an overview of themes found in previous research as well as theory-based input for future research efforts on eGov sustainability, both from a dynamic and a socio-technical sustainability perspective.

The conclusions in this paper are:

- The use of sustainability theory in current eGov research is weak, and use of the concept is to a large extent arbitrary and shallow.
- Most eGov papers focus only on one sustainability dimension, while papers that include and integrate all four categories (social, economic, environmental and technical) are sparse.
- The social aspects of sustainability are focused on in the majority of the papers, whilst other aspects are highlighted to a lesser extent.
- There is a limited view of what is to be made sustainable as there is more often a focus on the sustainability of a project or e-Service rather than on more generally applicable factors directly derived from public sector values, such as trust, participation, information infrastructure and economy.
5.5 Paper 4 – eGovernance practice from a sustainability perspective

Paper 4 directly stems from the conclusions drawn in paper 3; namely that there is a need for eGov case studies that are explicitly based on a dynamic and socio-technical sustainability perspective. Hence, the research question of this paper is: How can current eGov practice be interpreted from a sustainability perspective?

A case study was performed in the context of Swedish eGov practice, at both a national and a municipal level. The interviews focused on issues that are central to eGov research, including the work performed and the way in which cooperation was carried out. They were intentionally broad and scoping. The analysis resulted in three broader themes, from which I give some examples.

The first theme included: the structures of governance and the way in which eGov is perceived to be in need of a perspective where Sweden is seen as an enterprise rather than as a collection of separate actors.

To a large extent, social and economic factors are central. Several actors highlighted, in different ways, how traditional borders and decision making structures were brought into question. To some extent, eGov has to do with testing the water and moving beyond or circumnavigating traditional structures. Actors at all levels highlighted this fact. In order to use ICT to improve the public sector, coordinated decision making was seen as fundamental. Nonetheless, governance imposes challenges. Indeed, governance of public sector ICT was still perceived as an emergent and tentative activity. Networks were constructed with the purpose of being able to serve as the backbone for attempts to outline or lay out the groundwork for a new decision making structure that would be able to provide effective horizontal integration of services within the traditionally vertically organized government. However, similar to what was seen in case 1, such networks were yet lacking actual decision making power. Municipalities, specifically, are autonomous. However, often, for economic reasons, they were not only willing to give up some of their autonomy in eGov matters, but also actively requested that CeSam (the coordinative organization) would take a more proactive role and start to give clear instructions as to how municipalities could take a common direction. Other actors went so far as to argue that the structures of the Swedish public sector, with its
high levels of local autonomy, were problematic for eGov planning and decision making. Consequently, they were by and large seen to be obsolete. Thus, traditional borders were indeed being questioned.

The economy and budgetary planning were held to be a central aspect of being able to “see the bigger picture”. Governance problems included working within a common timeframe, and the need to show “more bang for your buck” in each organization, as well as the need to understand how funding structures needed to change. A reoccurring argument was this; that in order to fund eGov in a sustainable way, individual actors could no longer maintain funding of their own initiatives and nothing else. In Swedish public practice, investments have to be motivated with regard to how much they “save” for the individual organization. There is a lack of incentives for funding joint programs, where the rewards might be visible in another organization or organizations. Thus, it was hard to motivate decision makers to invest in common eServices that would enable a more economically sustainable public practice but would not yield direct savings in their own department.

The second theme included: new ways of cooperation; and methods for identifying actors who could be involved and help define needs for eServices on the one hand and stimulate the use of services by citizens and organizations on the other hand. In one respect, this theme relates to finding new ways of cooperating and getting input from different actors. The need for collaboration in new groupings and with new people whose voices have not been heard before was held as central. New perspectives were expected to emerge by arranging meetings, networks and projects between organizations with different perspectives, as well as meeting up with different citizen groups (e.g., meeting school children or opening up proposed policy documents for scrutiny by citizens using a wiki-format). A core belief was that “synergy effects” would emerge, and that new and daring ways of thinking and doing would be the result. Furthermore, such groupings were expected to facilitate the outlining of new needs and ideas on how ICT could be used to bring improvements to the public sector.

The theme is also related to the encouragement of use and adoption of already created eServices and ongoing initiatives. Many planned eServices were seen as potentially beneficial for both government agencies and citizens. However, they were not yet adopted by citizens and organizations to the extent, or at the pace, intended. A core issue was thus how to communicate the “usefulness” and potential benefits of eServices and interoperability as well as how to create a spark that would prompt municipali-
ties to start utilizing services and join in on initiatives. A central concern was that the different actors needed to be informed that eServices and initiatives existed at all. On the other hand, decision makers and practitioners also needed to gain an insight into the actual incentives of working with ICT in a coordinated and cooperative way. They needed to be able to “see the usefulness” as well as understand the need for the adoption of sometimes costly investments. At the same time, there was also a belief that when services and initiatives got going, the effects would escalate and the organizations themselves may be able to identify new ways of benefiting from ICT use. Similarly, citizens also needed to be informed and encouraged to adopt and use the provided eServices.

The third theme included: the emergence of infrastructure, which was perceived as a foundation for ICT use for improving public practice; and the issues involved in making it happen.

In order for citizens to benefit from faster and easier eServices, information sharing must not only be technically possible but also legally allowed; availability and privacy are central to eGov practice. Overall, the legal situation was perceived as problematic, as it relied on notions of information exchange that were not up to date with the digital age in which we live. This means that it is often difficult to at all sort out what is allowed and what is not in terms of information exchange. Changes in regulations were highlighted as the foundation for enabling the use of ICT “as it should be”. Thus, several actors argued for greater changes; namely, to carry out a thorough analysis of the current legal situation and its drawbacks for Sweden as a whole. As with the Swedish government structure, as discussed in theme 1, the legal situation was, to a large extent, perceived to be obsolete.

An interoperable infrastructure was also perceived as a necessity for achieving more financially and socially sustainable public practices. Of particular concern were the discussions about what should be included in an “infrastructure”, and who should implement it. The issues involved wide-ranging complexities, from hardware aspects, such as how to deal with servers, to software aspects, such as which standards should be used and who should set them. Other aspects had to do with who should be involved in the planning and provision of eServices, electronic filing systems and other “solutions”. In these discussions, public actors were not the only ones involved; they were joined by private companies who were interested in getting their share of the market. Hence, the emergence of infrastructure was seen as highly complex.
The conclusions of this study were in summary:

- While previous research often treats one or two sustainability aspects separately, in practice they are interrelated in complex ways.
- Social and economic dimensions of sustainability are the ones mainly highlighted in practice.
- Technology factors are also raised, but unlike in eGov research, the technology is perceived as a taken-for-granted basis of eGov practice which is not problematized.
- The move towards more integration or interoperation was not problematized to any greater extent either. Mostly, it was highlighted as a necessary or given path of development in order to respond to future needs for a more efficient public sector.
- Environmental aspects were not highlighted as being central to eGov practice by practitioners.
- The analysis confirms that decision making is the key factor for the viability of eGov practice in the long run. However, current decision making structures and practices were not well established for meeting the challenges at hand. This also includes the view...
- …that information infrastructure should be seen as a process, rather than a project or program. This is because the information infrastructure is created by a large number of actors who are poorly coordinated. They make decisions in network groups, often lacking decision making powers. As a result, the information infrastructure of eGov evolves not through common and long-term goals, but through smaller goals of specific initiatives, negotiations and distributed decision making among independent actors.
- Hence, the finding from paper 3, that decision making and information infrastructure are two interrelated core aspects of sustainable eGov, is strengthened by these empirical findings.

Clearly, a large number of themes are involved in strategic eGov practice. The sustainability framework used for this analysis makes it is possible to investigate eGov practices from a sustainability point of view and to highlight any deficiencies.

The study also showed that eGov research on sustainability, while still lacking depth, has a focus that corresponds well to the issues that practitioners find most crucial for the future. The results provide a framework
for eGov sustainability issues that is both theoretically and empirically informed. This can lead to a theoretically and empirically founded conceptualization of two cross-cutting themes - information infrastructure and decision making - which were central in previous research as well as in practice. It is this framework that will be elaborated and discussed in the next chapter.

The paper was submitted to Government Information Quarterly as of December 20, 2013 (and is still under review at the time of writing).
6. Understanding eGovernance from a sustainability perspective

In this part of the thesis, I will discuss how the sustainability concept can be used as a tool for understanding the complexity of eGov. Thus, this is an outcome of the research process described in chapters 2 to 5. In the introduction to this thesis, I discussed the notion of a future-oriented perspective. Dawes (2009) argued that the research implication of a future-oriented perspective is that “there are many more ways to perceive the challenges ahead and to design research programs that will address them. This can be accomplished by taking advantage of a “big picture” view of the future as a complex and dynamic system (or set of systems), open to many kinds of influence and change” (Dawes, 2009). Hence, in order to take a future-oriented perspective seriously, the future needs to be understood as being both dynamic and prone to continuous change. A future-oriented perspective on eGov opens up questions about where we wish to go with the use of ICT for the benefit of public sector tasks and responsibilities, allows us to consider the potential negative outcomes. As argued in the introduction, the goal of eGov initiatives are seen as contested and need to be problematized. This is in line with perspectives found in contemporary conceptualizations of sustainability, which have increasingly moved from focusing on commensurability, consensus, and idealistic visions of how things ought to be, towards focusing on using the sustainability concept as a tool to capture, understand and mediate conflicts, incongruence and incommensurability. It is this theoretical perspective that is extended in this thesis, making it suitable for eGov research and practice.

In this chapter the sustainability concept is discussed (6.1) and expanded on with regard to a socio-technical perspective (6.2). My sustainable eGov perspective, which is central to this thesis, is then presented (6.3) and discussed with regard to related eGov research (6.4).

6.1 Sustainability as a tool for understanding complexity

The sustainability concept has been used in a multitude of research papers and policy documents, with a vast number of connotations. In order to contextualize the concept with regard to eGov, we must first go through some of its characteristics. I will briefly discuss the background of the
6.1.1 Foundations of the sustainability concept

Today, sustainability is a mainstream concept in public policy. It has a long history, with roots in the notion of humans living in balance with the environment, and only using natural resources to an extent that nature can handle. The notion of living with a regard for limited resources is central (Blewitt, 2008). The connotations often bring to mind a focus on “green” matters and the preservation of the environment, although the concept today extends beyond these issues to also incorporate society in a wider sense (CEE, 2007). How sustainability is discussed today is often summarized with regard to the Bruntland Commission’s report, in which sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WECD, 1987).

Different conceptualizations of sustainability exist, but they have much in common. These commonalities are: 1) a desirable human condition (a society that meets human needs, and which they want to sustain); 2) the endurance of the ecosystem (with regard to the capacity to support the life of humans and others); and 3) a balance between (and within) present and future generations (ensuring that the people living today will not live at the expense of people in the future, nor indeed other people today) (CEE, 2007).

As mentioned above, colloquial use refers to various concerns for nature and the environment. Typical examples include the reduction of transport and certain kinds of hazardous production, so as to reduce, or stop the increase of, carbon emissions into the atmosphere. In order to incorporate environmental care, however, the social and economic implications should not be ignored. One common argument is that there must be a cost calculated for harming nature so that reducing the harm can be calculated as a gain not only for nature but also in companies’ and governments’ accounts. In addition, economy cannot be discussed without also referring to social concerns. This has been clearly visible, for example, in the conflict over the distribution of pollution costs between countries. Here, for example, developing countries have felt that they pay too high a price when they have to quickly reduce the environmental impact resulting from using older technology, compared with “developed” countries. Based on the close and complex interrelation between social and economic issues...
a common conceptualization of sustainability has evolved: the triple bottom line (TBL) (Elkington, 1994). The TBL, or the three pillars of sustainable development, is often depicted as a pyramid or as three overlapping circles (as in figure 2) (CEE, 2007).

In the TBL method of “full cost accounting”, sustainability is defined in terms of the above-mentioned three aspects - social, economic and environmental sustainability - which all have to be robust over time, both individually and together. This is a model for conceptualizing sustainability in economic terms. It points out the interrelatedness between these different aspects and makes them come together in accounting methods that include them all (Slaper & Hall, 2011). In terms of TBL, sustainability thus refers to all of them together. From a TBL perspective, it is not possible, in the long run, for something to be sustainable if not all aspects are aligned. The TBL is not solely a theoretical construct but is also an important tool in everyday public sector practice. For instance, the UN has ratified the TBL (in 2007) in a specific implementation established by the ICLEI. This large global network of over a thousand cities and regions – among which are a number of “mega-cities” – takes in about half of the world’s countries (ICLEI, 2013).

The TBL is not the only operationalization of sustainability; others also exist, such as the egg of sustainability model (as defined by the International Development Research Center in 1997). This model places society within the environment in the same position as the yolk in an egg, high-
lighting how the natural environment and society are mutually dependent. However, the emphasis lies in the natural environment, as socio-economic development needs to occur within the framework of the “environmental carrying capacity” (CEE, 2007). The prism of sustainability model incorporates aspects of TBL, although there is an added institutional dimension, which is separate from the social. While the social dimension focuses on social cohesion and justice, the institutional dimension is about participation in and organization of society (Stenberg, 2001). In the TBL, the social and institutional are seen as entangled; thus they are both included in the social dimension. The main characteristics - social, economic and environmental - are, however, still maintained in the different models.

The use of the TBL and similar models has encountered criticism. There is often the assumption that as the factors are interrelated, they can also be commensurable. In the next section, dynamic aspects of the sustainability concept are highlighted, which questions this assumption.

6.1.2 A dynamic perspective on sustainability

Although the interrelatedness of social, economic and environmental aspects has been incorporated into several perspectives of sustainability, the TBL is not the only way to discuss these issues. In a review of sustainability guidelines, reports and indicator lists from between 1960 and 2001, Faber et. al. (2005) showed that more than 50 conceptualizations and definitions of the concept exist. They also identified a growing awareness that the concept has to take into consideration the dynamics of sustainability.

A dynamic perspective still includes the interrelatedness of environmental and socio-economic aspects. For instance, Sen (1999) criticized the notion of discussing sustainable development with a mainly economic emphasis. He argued that development cannot be about one-dimensional aspects, such as a sole focus on social, economic or environmental sustainability; it is rather about allowing each individual to lead a life that (s)he has reason to value. As such, Sen’s perspective is rather pragmatic. Ratner (2004) has also provided an example of a pragmatic perspective. He argued that sustainability is not about creating grand solutions. Instead, the concept should provoke a dialogue of values between different involved actors, such as the state and private businesses. According to Ratner:

“The sustainability concept is meaningful […] not because it provides and encompassing solution to different notions of what is good, but for the way
it brings such differences into a common field of dispute, dialogue and potential agreement as the basis of collective action” (Ratner, 2004).

Ratner further argued that sustainability should not be used as just another way to talk about sustained economic growth or successful development towards more consumption. Instead, meaningful interpretations should be multidimensional and complex. Social, cultural, ecological and economic goals can sometimes converge, but often they require discussion and trade-offs. As such, the dimensions are not considered to be fully commensurable (Ratner, 2004). From this perspective, sustainability is seen as a dialogue between different perspectives and values.

The value aspect of sustainability has also been highlighted by Marshall and Toffel (2004), who outlined a sustainability hierarchy pyramid that includes four steps, and is based on Maslow’s theory of human needs. Starting at the bottom of the pyramid, the steps are: the survival of humans; life expectancy and health; avoiding extinction of the species and violation of human rights; and, at the top, quality of life and convergence of values and beliefs. The authors argued that this is the least vital part of sustainability research. They went on to suggest that this aspect should not be incorporated into the sustainability concept as it would widen the concept to a greater extent than would be useful. However, from the perspective of Ratner (2004), I argue that it is precisely this complexity that makes it not only fruitful but necessary to incorporate conflicting values and complexities into the sustainability concept. If we are to understand sustainability we cannot delimit it to focus only on the most basic needs for humans, animals and nature to survive. We must also highlight discussions of how values and quality of life influence other aspects of sustainability, such as the struggle to maintain a viable ecosystem, and the signing of treaties to hinder the hunting or fishing of close-to-extinction animal species - both of which are, in fact, influenced by quality of life and the beliefs that humans hold.

A dynamic perspective of sustainability has been outlined by Faber et al. (2005), in their meta-analysis of sustainability. They focused on what it means to be made sustainable, which can be something concrete or physical like carbon emissions, or something abstract and conceptual like a policy. They also showed that the common understanding of the sustainability concept is moving away from perceiving goal orientation of sustainability as absolute - meaning a grand plan of “reaching” sustainability as the final goal. Instead, goals are today commonly perceived as relative,
highlighting the importance of a pragmatic perspective where goals and practices vary over time and are dependent on context. Lastly, the authors showed that the perception of the behavioral interaction between the environment (natural, social, or other) is perceived as changing in relation to what it means to be sustainable, thus focusing on a dynamic relationship rather than a static one. Furthermore they argued that what is to be made sustainable (the thing or phenomenon) is not only changed, but itself changes its environment. They argued that “sustainability is no longer perceived as an achievable goal, but as a continuing process of improvement”, which no longer targets an “ultimate state” (as no definitive good exists), but is context dependent (Faber et al. 2005). This is similar to the arguments put forward by Ratner and Sen above.

The view of sustainability as something that is dynamic fits well with the governance perspective and eGov as a dynamic socio-technical system; the goals of eGov both relate to changing the public sector (by improving it) and striving to uphold government values in a changing environment. However, with regards to the socio-technical aspect, we are in fact missing the technology aspect, which is discussed next.

6.2 eGovernance sustainability as socio-technical

TBL outlines three general dimensions for sustainability that are seen as interrelated and need to be aligned in order for something to be sustainable. Other perspectives incorporate a dynamic aspect to sustainability, highlighting the need to consider potential conflicts and incongruence between economic, social and environmental aspects and goals. The latter perspective also incorporates a process view of sustainability, as this continuous dialogue of values does not have any final state. Sustainability is thus considered to be contextually dependent; meaning that universal goals do not exist and that different areas of application have different foci. In addition, what enables sustainability in one context might not necessarily work in another. As this thesis is positioned in the area of eGov and IS (information systems), there is a need to also incorporate technology. Technology is obviously important as it lies at the heart of eGov and the IS field, and it would not be possible to discuss eGov without also highlighting technology. It is also important to consider technology in other fields as it may dramatically change the preconditions for, for example, environmental care. Following the view of technology and social aspects as inseparable as they are mutually dependent (Latour, 2005; Orlikowski & Baroudi, 1991; Orlikowski & Iacono, 2001), it makes sense to
include technology as a factor in other sustainability discussions. Hence, I have added a fourth dimension - technology - to the TBL. There are two main reasons for so doing.

First, technology is ingrained in almost every business and government activity today. Sustainability is, at the same time, both a global and a local business. Pollution travels across national boundaries, carried by the wind; thus, a joint concern for the environment requires standards and measures. It also requires data for regulating business and governments with regard to environmental issues. The costs of emission rights, auditing compliance and so on need to be calculated and collected by governments and companies and shared across countries. Technology has an important role in providing governments with the ability to do this. For example there is a need to agree on technical standards at many levels, and to develop and implement technology and train staff in numerous government agencies and companies to make this all possible. The huge number of failed eGov (and other) IT systems (BCS, 2004; Heeks, 2006) is testimony to the fact that these are not trivial issues that can be easily contained within the three sustainability categories included in the TBL. To the contrary, the implementation of large IT systems is a complex endeavor that requires special attention. And in order to do so, we cannot disregard technology as part of a social, technical or environmental system; rather, we need to highlight it.

Second, technology is intimately and intricately intertwined with organization and people. As the interrelations are complicated and cannot be easily measured, there is a need to put them under specific scrutiny. Technology and its users cannot be understood independently of each other, so there is a need to apply a perspective that includes both together. Specifically, I have applied a socio-technical perspective common in the IS field.

Dawes’ (2009) depiction of eGov as part of a dynamic and socio-technical system has highlighted the connection between technology development and use, societal trends and governance. The socio-technical concept is also of great importance to this conceptualization, because of the understanding it brings to eGov sustainability. Hence, in this section, I will briefly discuss a socio-technical viewpoint of technology before going on to outline how and why technology adds value to the TBL, as a tool for understanding eGov from a sustainability perspective.

A socio-technical perspective treats technology not as a mere tool or resource, but rather as an important factor in relation to society, even an actor alongside humans (Latour, 2005). A socio-technical perspective has
roots in the Tavistock Institute’s work in the coal industry in the 1940s, which aimed to support employees by aligning technology with practice.

Mumford, known for the ETHICS approach to systems design, relied on this notion, which is seminal in the IS field. Mumford defined it as follows:

“A socio-technical approach is one which recognizes the interaction of technology and people and produces work systems which are both technically efficient and have social characteristics which lead to high job satisfaction. Such an approach takes account of the fact that different individuals and groups have their own needs, interests and values and that these must be met if employees are to willingly and enthusiastically accept major change.” (Mumford, 1983)

The need to perceive technology as being interrelated with social aspects is at the core of this perspective, and lies at the heart of IS and related disciplines. Technology is perceived as an active player in the transformation of society. It is not a neutral tool, thus, it is necessary to consider its interplay with other actors in the specific social context (Latour, 1999; Orlikowski & Iacono, 2001). Orlikowski and Baroudi (1991) argued that technology is not neutral, because it changes as it is used, or when it is enacted by people. Technologies can thus both reinforce existing structures as well as spur changes of how things are done in an organization. Hence, in order to avoid disregarding technology as a neutral tool it should not be treated as part of other dimensions. Furthermore, if we look at it the other way around, sustainability is a suitable perspective to highlight the interrelatedness of technology and society, economy and environment. Instead of only focusing on the interrelatedness of the social and the technical, the inclusion of economy and environment highlight the strong driving force of the economy, and the (often disregarded) natural environment.

Hence, from both a sustainability perspective and a socio-technical perspective, the inclusion of a fourth dimension is fruitful. Technology is thus seen as a central part in the development of the public sector, and can act both as an enabler and an obstacle to sustainability.
As discussed above, the dimensions of the TBL need to be perceived as interrelated as well as potentially conflicting. The same view is employed with regard to the four dimensions of eGov sustainability (figure 3). The four dimensions are interrelated, although their interrelatedness is not necessarily harmonic.

Environment refers to a “natural” environment that includes natural resources, such as air and water quality. The social category is the widest, comprising citizens, business and government. Economy comprises different aspects of funding. Technology refers to such things as broadband infrastructure, software standards and electricity.

The model outlined above was the main tool of analysis in my review of eGov literature (paper 3).

6.3 The sustainable eGovernance framework

The four dimensions of sustainable eGov outlined in the previous section were used as a means to categorize themes from eGov literature that used the sustainability concept (see paper 3). These general themes were specified by a number of sub-themes from the literature in this review, adding a more in-depth understanding of what was contained in the themes, as summarized in table 8. Additional information regarding the specific content of each theme can be found in paper 3.
The framework was developed in paper 3 and then tested empirically in paper 4. On the one hand, the framework was tested as a tool for understanding eGov practice from a sustainability perspective. On the other hand, it was used to test the extent to which the themes outlined in previous research corresponded with eGov practice. As discussed in chapter 3 of this thesis, we found these different aspects of research to correspond rather well with those raised in practice. Specifically, the cross-cutting themes of information infrastructure and decision making were confirmed to be the two fundamental building blocks for sustainable eGov practice.

As a result of the theoretical outline of sustainability, the overview of the state of research on eGov research using the sustainability concept, the development of a general framework and the testing of said framework, this section outlines my framework for sustainable eGov (figure 4, on the next page).

As seen in papers 3 and 4, both cross-cutting themes are at the heart of eGov. What these two themes mean, however, calls for some explanation.
6.3.1 Decision making

Decision making lies at the heart of sustainable eGov; indeed, it is the fundamental process through which the public sector ICT evolves. Decision making today is highly related to the governance concept. This concept was discussed in the introduction and in chapter 2. In summary, governance refers to the inclusion of a multitude of different actors in policy making and policy implementation, where network approaches are used and, as seen in the case studies, often with issues of little or no decision making power. Who is included in governance and who makes the decisions is thus far from clear cut.

Hence, decision making in eGov involves a number of more or less independent actors who have to coordinate their actions – under the leadership of government – so to achieve societal goals which, in their entirety, lie beyond the business focus of each organization. Achieving such goals requires coordination of decisions across actors so that they each can focus on parts where they can find both business benefits for their own part and contribute to the overall greater societal good. Decisions transgress the four dimensions of social, economic, environmental and technical. Decisions might not be directly related to each dimension, but can nonetheless influence them. For instance, decisions taken on economic grounds might not necessarily be socially or environmentally sustainable. Furthermore, decisions regarding technology can strongly influence the other
factors. As has been highlighted with regard to green IT, technology needs to be considered with regard to its environmental impact (Bengtsson & Ågerfalk, 2011). However, the impact of technology on sustainability is not solely, or even mainly, environmental, but can also fundamentally influence how the public sector functions. With regard to ICT and sustainability, we also need to consider the interrelatedness of social and economic aspects (Dao, Langella, & Carbo, 2011).

Decision making is a core theme in previous eGov research (paper 3) as well as in eGov practice (paper 4). How decisions are made affects the extent to which ICT can contribute to better public practice. Decision making is a core aspect of getting eGov to function. Both in research and practice, the need for a more integrated decision making structure with regard to a variety of issues (including laws, standards, funding, and goals) is highlighted. However, distributed decision making means that there is a need to ensure the grounding of decisions at different levels of government.

6.3.2 Information Infrastructure

The other cross-cutting theme is information infrastructure. Information infrastructure has been defined as: “A large, shared, open, standardized and heterogeneous network of socio-technical actors” (Janssen & Nielsen, 2005). Information infrastructure has been defined from a specifically socio-technical perspective by Cordella, who argued that it is:

“[T]he sum total of the dynamic processes of an organizations’ actions that shape - and are shaped by - the continuous influence exercised by humans over technologies, and vice versa. Information infrastructures are hence considered more than the outcome of a dynamic set of relationships. [...] IIs are in action, meaning they are not stable but performed in, by, and through relations.” (Cordella, 2010)

Others also point to infrastructure as being something that evolves over time and involves some kind of open or shared standards, which can be utilized by the involved organizations and users as a shared resource (Janssen & Nielsen, 2005). Furthermore, information infrastructures involve users’ interpretations and appropriation of technologies, as well as dynamic interactions between the development of new technologies and the installed base (Ciborra, 2000). Information infrastructure is the evolving basis for the way in which the public sector can deliver services to citizens as well as operate “back office”. Furthermore, an information
infrastructure is a complex structure, which involves conflict-prone matters such as standardization and questions about the purpose of its existence (Hanseth et al., 2006; Hanseth & Monteiro, 1997). Information infrastructures include “hard” components (e.g., hardware and broadband access) as well as “soft” ones (e.g., standards, information security, and information processes). They lie at the heart of the public sector and are highly complex, because they are influenced by, and themselves influence, economic aspects (potentially saving money), the environment (electricity usage and carbon footprint) and social aspects (for instance, access to the Internet, which can enable or delimit eService use and participation). Hence, by taking a broad view, all four dimensions of sustainability are covered. In this respect, they influence how public practice is performed, and are continuously shaped by the (coordinated or uncoordinated) decisions made.

By definition, information infrastructure, in relation to eGov, is a huge and complex concept. It is something that is crucial for both public sector actors and citizens (who are also users of eServices and receivers of services supported by the information infrastructure). Information infrastructure involves the economy, because it has to be funded by public actors, by taxes, by private organizations and/or international donors. Previously, government was the main provider of the most important infrastructures, such as roads, because they are a societal good and government is set up on the promise of providing social goods. In a governance system – particularly in today’s world, the number of important infrastructures has grown to encompass, for example, digital communication systems. These are also increasingly global and hence beyond the control of individual governments. Hence, government cannot afford or manage to provide information infrastructures solely through tax. It needs to set up joint financing models and ensure compatibility across projects, e.g., Internet communication standards, hospital patient records and also the ability to communicate with other information infrastructures, so that they become as universally usable as possible.

Paper 3 showed that there is a vast array of themes relating to various dimensions of the information infrastructure. Apart from those themes that explicitly include the term infrastructure, themes such as “security and control” also necessarily involve information infrastructure dimensions. For example, there is a need for an extended legal infrastructure to regulate security and privacy, a technical and organizational infrastructure to implement digital systems, and an international (technical and legal)
infrastructure to make national digital identities and e-transactions operational across countries. All aspects of information infrastructure planning and evolution involve decisions made by actors inside and outside the public sector. Hence the aspects of decision making and information infrastructure are closely related.

To summarize, eGov sustainability is seen to be situated in a dynamic socio-technical context, where information infrastructure and decision making are two core aspects that transgress all four sustainability dimensions. Hence, these cross-cutting themes are particularly important, because they influence, or even determine, several other themes. At the same time they are to a large extent influenced by potentially disparate initiatives from both the public and private sectors, because a vast array of actors influence the information infrastructure and take part in decision making. Furthermore, the evolution of an information infrastructure is very much a part of the governance process. It involves a large number of different actors both within and outside the public sector. The roles of the involved actors may change and new economic arrangements may have to be made. Likewise, policies and laws may change and environmental risks are ever-present.

Now that the general characteristics of my view of sustainable eGov have been outlined, I will go on to compare it with other frameworks with a similar focus.

6.4 eGovernance and sustainability – comparing my framework with others

As mentioned, there is a lack of research with a specific focus on eGov and sustainability. In the literature review (paper 3), it was found that a total of 94 papers (up to 2012) referred to the concept in a meaningful way, although there was little in the way of theoretical basis, and the concept was often used arbitrarily. The lack of a common theoretical focus or directions in the eGov field might be attributed to the fact that the sustainability concept in itself lacks a common theoretical base, but rather consists of a number of different approaches and definitions (Faber et al., 2005). The concept has also been criticized for being used in relation to a large number of phenomena and for referring to a vast amount of things (Marshall & Toffel, 2004).

However, a few papers have attempted to conceptualize eGov from a sustainability perspective, or relate it to sustainability in some way (Klischewski & Lessa, 2012) (Estevez & Janowski, 2013) (Dzhusupova et
al., 2011). As discussed in the introduction to this thesis, sustainable eGov is an emergent research area that is beginning to take form in response to obvious needs in practice. Given the tentative state of eGov research, it is important to establish which frameworks exist, determine their basis in sustainability theory and understand how they overlap with each other, if this is indeed the case. This section will seek to address these issues.

I will discuss the three other frameworks that operationalize sustainability in relation to eGov, in relation to each other, and in relation with my framework of sustainable eGov. Thus, this section contributes with a first step towards outlining a direction for knowledge exchange and creation in the emerging area of sustainable eGov research and practice.

### 6.4.1 Frameworks dealing with eGovernance and sustainability

In order to provide an overview of the different frameworks (including my own), I summarize each of them with regard to the type of study, the purpose, the focus, the nature of their basis in sustainability theory, the general dimensions of sustainability that are outlined in the respective framework and the purpose of the framework. These points of comparison are suitable for outlining the way in which the frameworks are theoretically and/or empirically founded, how their scopes and focus differ and how they are useful to eGov research and practice. The summary can be found in table 9.

Both Lessa and Klischewski (2012) and Estevez and Janowski (2013) observed that sustainability and eGov have not been sufficiently researched or approached in a comprehensive way, despite being highlighted as important. This supports my findings (given in paper 3), that the state of the field is in its infancy.

**Table 9. Frameworks of eGov and sustainability (continued on next page)**

<table>
<thead>
<tr>
<th>Paper</th>
<th>Type of study</th>
<th>Focus</th>
<th>Sustainability theory basis</th>
<th>Sustainability dimensions</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dzhusupova et al. (2011)</td>
<td>Literature review</td>
<td>Critical factors for eGov in developing countries. Developing a framework.</td>
<td>No discussion.</td>
<td>Ownership, leadership, vision and strategy, institutional capability, design versus reality, capacity and awareness and dependence on external assistance.</td>
<td>Outlining critical sustainability aspects for eGov (in developing countries).</td>
</tr>
</tbody>
</table>
### 6.4.2 Type of study

All frameworks are (partly) based on literature reviews.

The first two papers have a basis in rather narrow reviews of literature. Dzhusupova et al. (2011) conceptualizations of sustainability are based on the implementation challenges of eGov in developing countries and is predominantly based on literature that relates to the success of eGov, rather than on sustainability theory. The paper by Lessa and Klischewski (2012) builds partially on a paper by Dzhusupova et al. (2011), in which the seven sustainability challenges are incorporated into a framework. Their framework does however extend beyond that put forward by Dzhusupova et al. by including more eGov papers and other critical factors for eGov success. It also includes sustainability in order to highlight the linkage between the two concepts of success and sustainability.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Type of study</th>
<th>Literature review</th>
<th>eGov research field. Developing a framework.</th>
<th>TBL with a focus on the alignment of the three dimension..</th>
<th>Two main categories; eGov success and eGov sustainability are outlined, with multiple aspects under each theme.</th>
<th>Aligning sustainability and eGov success.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lessa &amp; Klischewski (2012)</td>
<td>Large structured literature review</td>
<td>Sustainable development and eGov as different research fields.</td>
<td>The prism of sustainability model, which is an extended version of TBL, adding an Institutional dimension.</td>
<td>Divided into eGov and sustainable development (SD). eGov covers: government, technology, interactions, customers and society. SD covers: social, economic, environmental and institutional.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estevez &amp; Janowski (2013)</td>
<td>Large structured literature review</td>
<td>eGov research field and eGov practice.</td>
<td>Triple bottom line &amp; sustainability as a dialogue of values, adding a dynamic perspective.</td>
<td>Social, Economic, Environmental, Technical, With information infrastructure and decision making as cross-cutting themes, highlighting the dynamics between the dimensions.</td>
<td>Outlining sustainability themes in eGov and sustainable development research literature.</td>
<td></td>
</tr>
<tr>
<td>Larsson &amp; Grönlund (Papers 3 &amp; 4 of this thesis)</td>
<td>Large structured literature review &amp; Case study</td>
<td>eGov research field and eGov practice.</td>
<td>Triple bottom line &amp; sustainability as a dialogue of values, adding a dynamic perspective.</td>
<td>Social, Economic, Environmental, Technical, With information infrastructure and decision making as cross-cutting themes, highlighting the dynamics between the dimensions.</td>
<td>Outlining sustainability themes in eGov research literature and practice.</td>
<td></td>
</tr>
</tbody>
</table>
The framework put forward by Estevez and Janowski (2013) and my framework both rely on large, structured literature reviews, albeit with different approaches and goals. The paper by Estevez and Janowski (2013) is comprised of a literature review that investigates sustainable development and eGov as two different areas. They initially defined eGov sustainability based on select literature about eGov and the prism of sustainability model; the latter is an extension of the TBL, with an added institutional dimension. They defined it as follows:

“EGOV4SD is the use of ICT to support public services, public administration, and the interaction between government and the public, while making possible public participation in government decisionmaking, promoting social equity and socio-economic development, and protecting natural resources for future generations” (Estevez & Janowski 2013)

Based on this definition, they made a structured selection of journals relating to the eGov field and the sustainable development field, and carried out a literature review of these journals. This review captures the papers that deal with those matters that fall within their initial definition of EGOV4SD. In comparison, the outline of my framework started out with the general categories of the TBL, and added a technology dimension. From this a literature review was carried out using the eGovernment Reference Library (EGRL), as well as additional database searches. All papers that dealt with the sustainability concept in any meaningful way were included. Hence, a main difference between my literature review and that put forward by Estevez and Janowski (2013) is that they focused on a pre-defined notion of sustainable eGov, while mine was inductively defined. Nonetheless, the themes found in our respective reviews were not all too different.

6.4.3 Focus of the frameworks
All frameworks focus on the eGov research field in different ways. The framework put forward by Dzhusupova et al. (2011) focuses on challenges faced by developing countries as they attempt to (primarily) guide practice. Lessa and Klischewski (2012) focused on developing a framework for guiding eGov research, and aligning sustainability and success. Work by Estevez and Janowski (2013) focused on the two research fields of eGov and sustainable development, outlining previous research, and providing a framework for further, interdisciplinary research. It is also intended to be used by practitioners. Similarly, my framework focuses on providing an
outline for research in the eGov field, as well as identifying the relevance of these issues for practice.

6.4.4 Sustainability theory basis
All frameworks, except that put forward by Dzhusupova et al. (2011), rely at least partly on the TBL as a basis for sustainability theory.

Lessa and Klischewski (2012) discussed the background to sustainability theory but mainly highlighted the TBL and the importance of alignment between the three dimensions. The paper by Estevez and Janowski (2013) also discussed the foundations of sustainability, focusing on the prism of sustainability, which is an extended version of the TBL and includes an institutional dimension. My model is based on TBL, as well as on a dynamic view of sustainability, perceiving the dimensions of the TBL to be a dialogue of values.

Overall, then, the frameworks rely on the notion of TBL. Lessa and Klischewski (2012) explicitly stated that the alignment of the dimensions is of importance. I have also highlighted the conflict-prone relationship between these dimensions. Estevez and Janowski (2013) did not clearly position themselves with regard to how the relations between the dimensions are perceived.

6.4.5 Sustainability dimensions
Dzhusupova et al. (2011) put forward dimensions that focus on the sustainability challenges of eGov projects in developing countries, namely: ownership, leadership, vision and strategy, institutional capability, design versus reality, capacity and awareness, and dependence on external assistance.

Lessa and Klischewski (2012) have incorporated the above themes from Dzhusupova et al. (2011) and outlined two main categories - eGov success and eGov sustainability - with multiple aspects under each theme. To summarize, their dimension “Enablers of sustainability” is mainly concerned with; having a long term vision and acknowledging the importance of sustainability; aligning and cooperating with local stakeholders, politics and local needs; building, facilitating and sustaining political leadership, including marginalized groups; and continuous adaption to available resources and changing goals. The “Enablers of eGovernment success” dimension is concerned with; having a clear and realistic plan, goal and implementation strategy; committed leadership; focus on target groups, local needs and building capacity; understanding the local political con-
text; and choosing appropriate technology, taking into consideration the maturity of systems (with regards to services and interoperability).

In their research, Estevez and Janowski (2013) focused on two areas: eGov and sustainable development. Themes relating to eGov include: government, technology, interactions, customers and society. Sustainable development themes include: social, economic, environment and institutional aspects.

My framework consists of several themes, which can be divided into social, economic, environmental and technical aspects. Information infrastructure and decision making are cross-cutting themes, which exist across the other themes. As my themes are outlined in section 4.3, so I will not go into detail here. I do not distinguish between eGov for sustainable development and sustainable development itself. Furthermore, the general dimensions in the framework put forward by Estevez and Janowski (2013) correspond well with the dimensions in my framework in terms of general categories. However, my framework is based in the eGov research field, as opposed to theirs which also looks at sustainable development. In addition, I have chosen not to divide the themes into two sections: eGov and SD.

For the sake of clarity, I will outline the position of these themes in my framework. Overall, the themes are mainly concerned with social aspects, as is also the case with my framework in general. If we look to Lessa and Klischewski (2012) and Dzhusupova et al. (2011), the themes are almost exclusively about social aspects, and can be positioned within the “social” category of my framework. The exception is that Lessa and Klischewski (2012) have also highlighted some aspects that can be said to fall within the technical category. The eGov themes put forward by Estevez and Janowski (2013) are also to a large extent positioned within the “social” category, with the exception of technology. As for their sustainable development themes Social and Institutional are, from my perspective, both included in the “social” category, as this covers citizens, business and government. Hence, making a separation between social and institutional would be problematic. Their other two themes are positioned within environment and economy accordingly. Thus, only my framework and that put forward by Estevez and Janowski (2013) highlight both the environment and the economy.

When it comes to the connection to sustainability theory and eGov research and/or practice, the frameworks differ. The themes put forward by Estevez and Janowski (2013) are general and do not align sustainable
development with eGov. Whilst the authors have provided an extensive account of the content of the papers and the different research problems in their appendix, these comprehensive summaries refer only to the general dimensions. This is connected with the purpose of their research, which is mainly focused on aligning the two research fields rather than providing guidance to those in practice. The themes put forward by Lessa and Klischewski (2012) are closer to practice, with themes being derived from existing literature on eGov sustainability. However, the connection with the TBL, which they raised in their paper, is not clear in the framework. The themes put forward by Dzhusupova et al. (2011) are also closely related to practice, relying on a literature review of challenges in developing countries. However, the connection with sustainability theory is lacking. My framework is clearly based in the TBL, with an extension to include a technology dimension. I have also relied on the notion of sustainability as a dynamic dialogue of values.

6.4.6 Purpose
With the exception of the framework put forward by Dzhusupova et al. (2011), the purpose of the frameworks is to create a common focus for sustainable eGov research. To this end, each of the frameworks has a different focus. For example, Klischewski and Lessa (2012) have focused on sustainability and success, and Estevez and Janowski (2013) on the alignment of the two research fields (to further an interdisciplinary agenda). I focus on how the sustainability concept a) has been used in research and b) could/should be used in research and practice.

Dzhusupova et al. (2011) focused specifically on developing countries, an area that has also been highlighted by Lessa and Klischewski (2012) as being particularly important with regard to sustainability. However, all four frameworks are applicable to eGov in general. The extent to which eGov and ICT for development (ICT4D) overlap is not, however, within the scope of this thesis.

Both Dzhusupova et al. (2011) and Klischewski and Lessa (2012) focused on the sustainability of eGov initiatives. Overall, however, a holistic vision of sustainability is lacking. The framework put forward by Estevez and Janowski (2013) and my framework both raise wider dimensions of sustainability, highlighting the interconnectedness of the social, economic, environmental and technical aspects, although with a different emphasis. A core question that is explicit here is thus whether to focus on the sustainability of eGov initiatives, eGov in a wider context, how eGov can
contribute to sustainability, or all aspects jointly. Dzhusupova et al. (2011) and Lessa and Klischewski (2012) focused more on specific initiatives and, to some extent, the wider context, although this is considered to be an “external factor” that influences eGov sustainability. Estevez and Janowski (2013) explicitly focused on eGov for sustainable development, while my framework, being derived from eGov research, incorporates both sustainability of eGov, and eGov for sustainability.

6.4.7 Summary: My frameworks’ contribution to sustainable eGovernance
To briefly conclude this section, I summarize how my framework differs from the others. In so doing, I will clarify my specific contributions to theory and practice.

The frameworks discussed in this section are clearly designed to fulfill different purposes and take different approaches. The other frameworks use TBL as a main theoretical basis (if any theory), and focus either on sustainability of eGov or how eGov can contribute to sustainable development. These frameworks all rely on literature reviews that are either narrow or rely on a pre-defined notion of what sustainable eGov is.

My framework stands out compared to the others as it is: 1) founded on the TBL as well as the dynamic sustainability theory; 2) concerned both with eGov for sustainability and sustainability of eGov; 3) is content-rich from a structured review of the use of the concept in eGov literature, and; 4) tested on eGov practice. Hence, my framework is relevant to both research and practice, as tested in paper 4.

That said, I do not claim that my framework is necessarily the best for all intents and purposes. However, the focus, content and method of outlining my framework are indeed well suited given the purpose of this thesis; namely, to investigate how eGov can be sustainable in a complex organizational environment. Hence, the uniqueness of my thesis rests on the dynamic perspective it takes of both eGov and sustainability and that it is both theoretically founded and empirically tested.
7. Discussion: Sustainable eGovernance

“The Future, capital-F, be it crystalline city on the hill or radioactive post-nuclear wasteland, is gone. Ahead of us, there is merely... more stuff. Events. Some trending to the crystalline, some to the wasteland-y. [...] This newfound state of No Future is, in my opinion, a very good thing. It indicates a kind of maturity, an understanding that every future is someone else’s past, every present some else’s future. Upon arriving in the capital-F Future, we discover it, invariably, to be the lower-case now.” (Gibson, 2012, p. 41)

In this chapter, I discuss what it means to view eGov from a sustainability perspective, how Information infrastructure and decision making are central as conflict dimensions that highlight the “dialogue of values” and how my framework can be used as a future-oriented lens when looking at eGov practice.

7.1 eGovernance from a sustainability perspective

In order to perceive eGov from a sustainability perspective one key aspect is to take a holistic view; in other words, avoid delimiting the focus to the sustainability of single initiatives. Sustainability must be considered with regard to the entire system. Previous eGov research, using the sustainability concept, has often had a single project focus, rather than a focus on the public sector as a whole. Also in eGov practice (as seen in the case studies), the issues involved with having such a focus were highlighted.

7.1.1 Focusing the entire system

If we look to the literature review in paper 3, which examines the use of the sustainability concept in eGov research, we see a large number of papers that address the success of specific initiatives. In terms of my sustainability perspective, this focus is too narrow and, thus, is not sustainable in itself. Can we then see a successful implementation of a project as sustainable? Not necessarily, as the project in itself might counteract other eGov initiatives, or might even prove to be problematic in the future. If we instead broaden our scope to include the public sector as a whole, the picture becomes much more complex. An initiative must then be considered with regard to the whole ecosystem of ICT use in the public sector.

In order to illustrate the need to focus on the entire system, let us take an example. From a narrow perspective, an initiative could be considered sustainable if it managed to get continuous political support and funding.
The implemented solution, for instance an eService, could then continue to exist. However, from the perspective of sustainability as a dynamic process, the initiative needs to be understood in relation to other eGov initiatives and policies and, even broader, different views on what the public sector should do, and how. The eService might, then, not be considered sustainable as it might not, for instance, be seen to be economically or socially sustainable for the entire public sector; it might be a stovepipe initiative. In such a case, the eService might actually cost the public sector as a whole a lot of money if it does not interoperate with other eServices. This may lead to redundant data or that the citizens who want to use the service may have to input once again information that is already stored in a government database. The project, being specifically funded, might indeed tap public funds of resources that would have been better spent on coordinated efforts. Or, an eService might not be socially sustainable either, if its usefulness to citizens or businesses or the extent to which it actually fulfills public sector goals were not thoroughly established. And, of course, stovepipe solutions might require use of redundant hardware, leading to increased energy consumption, which might not be environmentally sustainable.

Another example would be to increase interoperation between agencies and allow easier access to information across traditional borders. Such a vision has often been claimed as being at the heart of eGov efforts, and a key to bringing improvements to the public sector. However, such changes might indeed be problematic. For instance, increased interoperation may indeed be beneficial in one case. For instance it can lead fulfillment of project goals, rewriting of laws to enable information exchange, and the emergence of new work practices. However, whilst this might constitute a successful initiative, it may also have substantial negative effects on the public sector as a whole, transforming how practice is carried out. The effects might be direct, putting up obstacles to the performance of tasks that were once carried out with ease. Effects may also be felt over the long term and as initiatives may play a part in a bigger change where traditional borders can indeed be challenged. However, whether or not this is positive should not simply be a question of whether something is made more efficient by using ICT; rather, it must be considered as a highly political act, and be analyzed as such. Hence, in terms of the governance perspective of this thesis, focusing on the entire system highlights the need to consider such changes, as well as the planning and use of ICT in the public sector as a political process.
As such, this process needs to be questioned and studied in terms of the different conflict dimensions that exist (see 7.2 for further discussion).

7.1.2 Process focus vs goal focus

Another central aspect of perceiving eGov from a sustainability perspective is the move away from the belief that, one day, we will achieve reach a best form of eGov. Instead, we should focus on the continuous processes of negotiation.

As highlighted in the case studies in this thesis and in a cornucopia of cases in eGov research and practice, the struggle towards having a more interoperable public sector, one which enables what we want to achieve today while not delimiting what we would want to achieve tomorrow (to paraphrase the Bruntland Commission), is filled with conflicts. The public sector is not only large but is also a part of society. To try to involve all stakeholders or to meticulously define a target information infrastructure and go through a series of structured development stages is thus not a feasible task. What’s more, the actors involved are not and cannot be aligned in any comprehensive way. Hence, a sustainability perspective rejects the notion that eGov can be depicted as happening in clearly defined stages that can or even should move in a certain “direction”. As discussed in the introduction, stage models and benchmarking frameworks have been common tools used to “measure” eGov development. However, they assume commensurability and consensus in how actors inside (as well as outside, at least in some conceptualizations) the public sector can agree on where they are headed and how to get there. To view development in such an instrumental and deterministic way does not enable sustainability. Instead, we must incorporate the continuous emergence of new directions, issues and effects. This happens through the implementation and use of ICT in different initiatives that influence the emergence of an information infrastructure, and give rise to new opportunities and threats to the sustainability of public sector practice and society as a whole. Sustainable eGov is not a goal, but a process. Hence, we must thus continuously question how different initiatives influence the sustainability of public sector ICT use as a whole.

The issues involved in making decisions and coordinating actions influence the emergence of information infrastructure. By focusing on these issues, we can begin to grasp the changes, and what may occur when ICT is used. Hence, planning of ICT use can increasingly be equipped with tools that enable the involved actors to understand eGov as a continuous
process, where there are different values and goals that may not be commensurable. The question of why each eGov initiative exists is thus highly relevant, not only in terms of what a particular project or initiative wishes to achieve, but wider, in terms of how initiatives and their coordination (or lack thereof) is a continuous process in which information infrastructure emerges and re-emerges, shaping our future society. This relates to the two cross-cutting themes, which will be discussed in the next section.

7.2 Critical factors: Decision making and information infrastructure

In conceptualizing sustainable eGov, the two cross-cutting dimensions of information infrastructure and decision making are highlighted. These dimensions relate to the notion of sustainability as a dialogue of values. They not only encompass a vast amount of different aspects, but are also conflicting dimensions, which are continuously evolving.

Decision making is seen in previous eGov research (see paper 3), as well as in practice (as shown in the case studies) as a key enabler, allowing the planning and execution of initiatives that focus not only on emergent and specific needs, but also consider the entire system (the public sector as a whole) and future development. However, it is also evident that such structures are to a large extent lacking. Instead, initiatives are seldom coordinated or (perhaps even less so) aligned with regard to common goals, standards or time frames. Instead, to a great extent, decision making, takes place in ad-hoc groupings or loosely coupled networks, without formal decision making power. Furthermore, the incentives for coordinated decision making are weak or lacking. In the case studies, this is largely due to decentralization and the localized structures of economic incentives, making coordination seem unprofitable. However, it is also connected with a lack of understanding as to why decision making concerning ICT should be performed jointly and as politically coordinated processes, rather than by letting local IT professionals handle these issues. Indeed, the understanding of the necessity for coordinating the planning and use of ICT is gaining foothold. That said, in the cases in this thesis, current eGov practice does not yet have in place the structures or incentives for it to gain pace.

Information infrastructure is emergent and is the framework within which eGov functions. The introduction to this thesis included the notion of interoperability as being at the heart of eGov today; indeed, this is evident when it comes to information infrastructure. In order for eGov to be
sustainable, public sector organizations need to be able to work together in gathering, storing and transmitting information. This statement is evident across eGov research. However, if we look to the values involved, it is not that simple.

The organizations and actors that should be connected, and how they should be connected, is a conflict-filled issue. It is not as simple as stating that more interoperation would be inherently better. On the one hand, an economic argument would be that it would be more effective if public sector organizations could access all information available on a citizen. On the other hand, this might not be socially sustainable, given that citizens might be reluctant to share such information. Laws in countries might delimit the sharing of information, which could be perceived as problematic and (as argued by some of the actors in the case studies) something that needs to change. However, from another point of view, “old” laws can also be perceived as something that should be kept as-is; for instance, to maintain privacy. Furthermore, an environment argument could be that joint storage of information could decrease power usage and reduce the carbon footprint (with the need for fewer computers). It could also be the case that such initiatives might instead increase the need for power usage, because of an increasing information flow, or that further technological development can often lead to even greater power usage; for instance, compared with older cell phones, “smart phones” require more power and as thus less environmentally friendly. Clearly, the emergence of information infrastructure contains several conflict dimensions, which are not necessarily treated sufficiently. For instance, as evident in case study 2 and in the literature review of eGov research, environmental aspects are nearly completely absent, even though environmental sustainability is clearly a central debate in general public sector practice.

Inherent in the conceptualization of sustainable eGov in this thesis is that a balance or congruence between the different aspects of sustainability is not necessarily possible; indeed, in most cases it is not. Different perspectives mean different ways of viewing the world; thus, the harmony between, for instance, economic, social and technical aspects is not necessarily achievable. A robust technological infrastructure may, for example, require a large amount of funds, which might not be available, or may have to be taken from other parts of public practice. Neither is this necessarily the case with environment and technology. For instance a robust information infrastructure may consume large quantities of electricity and
incorporate hardware that contain many materials that are not in the least bit environmentally friendly.

eGov initiatives should not be perceived as given directions for societal development. Instead, we need to critically reflect (in practice, as well as in research) on the purposes, goals and means of such initiatives. The importance of such reflection is motivated by the empirically and theoretically founded claim that the use of ICT is situated in a complex context, where the actors included and the borders that are drawn are not easily identifiable; neither are the relations between nor structures behind them. Hence, the contribution eGov initiatives make to upholding, changing or (potentially) counteracting political and societal goals needs to be considered. This is important if we as researchers (as well as practitioners) are to be able to understand how these processes contribute to, or provide issues for, sustainability of public sector ICT use, as well as public practices as a whole. Otherwise, we might delimit what we want to achieve tomorrow, either socially, economically, environmentally or technologically.

7.3 The sustainable eGovernance framework as a future-oriented lens

We must look to eGov practice and research and focus on which aspects that are highlighted and which that are not. As such, the implications of eGov initiatives need to be understood. One way for research to start approaching this is by employing the framework presented in chapter 4, as well as the four sustainability dimensions and themes therein and, in particular, the two cross-cutting themes of information infrastructure and decision making. Sustainability can be perceived as a lens through which eGov practice and research can be discussed from a future-oriented perspective.

As shown in my case studies, as well as in international research, eGov needs to be critically analyzed in ways that move away from assuming ICT use to be essentially progressive and good. Clearly, we need a new path. I suggest that we perceive the sustainability of eGov not as a goal, where ICT allows us to be increasingly interoperable and effective, but instead as a process, where different values are at play, affecting decision making and information infrastructure emergence. It is necessary to move away from the conceptualizations that ICT is neutral, and a view of the transformation of the public sector as a straight line towards modernization. We must, in research as well as in practice, question these assumptions.
Sustainability is helpful as a guiding framework for eGov research and practice, as it helps outline which critical aspects that are focused in eGov initiatives, and which are not. For instance, initiatives may disregard environmental aspects, or have a strong focus on economic incentives and gains. Furthermore, the sustainability perspective is also useful from a higher-level perspective, as it begs us to continuously ask why a certain eGov initiative is performed, what it is expect to provide in terms of a better public sector and society in the long run, and if the initiative might be problematic in this sense. A sustainability perspective thus helps to highlight which perspectives (social, economic, environmental and technical) are highlighted, and which are not.

As eGov is complex and filled with conflicts between different actors and interests, the conceptualization of sustainability as a dialogue of values (rather than a goal) is suitable for discussing eGov sustainability. Hence, in this thesis, the sustainability perspective was used as a way of investigating how different interests and values, as represented by different actors and imbued in policies and technology, all interact and mutually shape the use of ICT. This happens in the context of public sector tasks and missions which, from a governance perspective, is overlapping and in a dynamic relationship with actors outside of the public sector. The different interests and values involved in these processes are not to be perceived as necessarily commensurable but, rather, as conflicting. Hence, a governance perspective problematizes how decision making should be done. Thus, there is a need for decision making models that can support understanding and decisions that enable ICT to be used in ways that can actually improve public practice as a whole, not just for smaller units in an uncoordinated manner.

However, I argue that we need to support understanding and decisions that enable ICT to be used so as to improve the public sector as a whole and align actors towards what is best for the entire public sector I do not mean to make a utopian statement. The core statement of the dynamic perspective on sustainability employed in this thesis is that we cannot become sustainable, as it is a continuous process. However, we should strive for increased understanding of the idea that ICT is not neutral and can affect how public practice is performed. Furthermore there is a need to acknowledge that completely uncoordinated decisions cannot be taken. This is because the information infrastructure would become cluttered, problematic and technically, socially, economically and environmentally unsustainable.
The framework that is presented in the previous chapter can be a useful tool to approach eGov through a sustainability perspective. The 21 aspects that are outlined, and divided into the social, economic, environmental and technical dimensions, can be used to highlight which aspects are raised, and which are neglected. The two cross-cutting themes of information infrastructure and decision making are the two dimensions that are fundamental. The 21 themes can be used as sensitizing tools to identifying which aspects are in fact dealt with in the planning, coordination and implementation of eGov. These themes should, however, not be treated as heuristics, but as a starting point. As argued in the previous chapter, my framework is indeed suitable for starting to discuss eGov sustainability as a dialogue of values. Hence, new themes can be added and existing ones revised, with regard to different contexts and practices. The framework as a whole is intended to be a guide for starting to discuss the core issues of where we are headed with eGov, which dimensions should be valued, and the potential implications of deciding not to focus on other dimensions.

Many of the problems that are pointed out in the cases studies in this thesis are not new to eGov practice or research. However, by viewing them from a sustainability perspective, it can help to develop an understanding of assumptions and ideas at play in eGov practice. Hence, a sustainability perspective serves as a critical lens through which a dialogue of values in public practice can be highlighted and questioned so as to be able to approach fundamental issues as why ICT is used in the public sector, and what it is expected to contribute to individuals, government, and society.

By perceiving eGov practice through the lens of sustainability, the focus moves from being concerned with the success or failure of particular initiatives to looking at the fundamental structures that are continuously evolving; namely, decision making and information infrastructure. These two central aspects form the fundamental backbone of eGov. If they are not working, it may result in lengthy discussions, costly projects and a lack of interoperability that would require citizens to navigate around a large number of different eServices. However, in the long run the issues might prove to be even more problematic for the public sector as a whole, because of the increased cost of running separate eServices, and the continuous lack of overview and alignment of different services, processes and goals. Consequently, new challenges may emerge. In order to talk about sustainable eGov, we cannot assume, therefore, that all implementations actually contribute to a better public sector; rather, we must be able to
highlight how initiatives can be problematic also in terms of non-economic aspects. Technical, social and environmental factors need to be considered, because such perspectives risk being diminished if economic incentives are focused and ICT is seen as neutral.

Hence, this thesis contributes by offering tools for further research that open up the discussion and analysis of eGov, where different values (or actors’ opinions, goals and perspectives) are seen as something that can and will clash in the continuously evolving use and planning of ICT. And, as ICT is becoming increasingly integrated as part of society, and the way in which the public sector operates, it also becomes increasingly important to consider the different forces that are at play.
8. Conclusions

The purpose of this thesis was to theoretically and empirically investigate the question of how eGov can be sustainable in a complex organizational environment. Based on two case studies in the public sector of Sweden, as well as a review of literature in the eGov field, this section summarizes the conclusions of the overall research question. (The conclusions for each of the sub-questions are presented in chapter 4.) The implications, contributions and suggestions for further research are then discussed.

8.1 Summary conclusions

My response to the overall research question of this thesis sums up the theoretical and empirical regarding eGov and sustainability.

Decision making in eGov is, by its very nature, inter-organizational; it transgresses and “pushes” traditional administrative borders. Because of this, eGov challenges current decision making structures, which are delimited to specific sectors or levels, e.g. local and national government, or different sectors within the national government structure.

We thus need to consider the sense in which changes to public practice through the use of ICT actually serve to contribute to a sustainable development of public practice, and in what sense it might be problematic. For instance, it would be highly problematic if changes were mainly driven by economic incentives, or the cost of social and environmental sustainability. Hence, it is of great importance to find models for decision making that can handle multiple actors and their differing opinions and perspectives, as the complex setting of eGov includes several conflict dimensions (social, economic, environmental and technical).

Technology is a central part in sustainable eGov. However, a core problem is that decision makers often lack understanding of technology as something other than a neutral tool; thus, they often fail to see the need for coordinated planning and interoperability efforts. Related to this, ICT initiatives are often downplayed as “technical” matters, which need to be handled locally.

There are several issues relating to the governance of planning and use of ICT in the public sector. These issues do not, however, only relate to a lack of understanding of ICT. They also have to do with more fundamental issues; the purposes and roles of eGov initiatives. Sustainability is helpful as a guiding perspective for eGov research and practice, as it helps outline which critical aspects that are focused in eGov initiatives, and
which are not. For instance, this may mean that environmental aspects are disregarded in favor of economic ones, or that social benefits may be highlighted that might not be economically sustainable. Thus, sustainability is helpful as a tool to ask the fundamental questions of what initiatives (be it projects or larger programs) contribute with, and what they leave out.

By investigating different levels of the Swedish public sector, as well as international peer-reviewed research, two cross-cutting themes have emerged as being central to sustainable eGov: decision making and information infrastructure. These two themes can be seen as the main aspects of sustainable eGov, because they lie at the heart of the system within which the public sector use of ICT evolves.

Information infrastructure is influenced by a multitude of actors and is seldom fully a result of plans and actions from a defined set of coordinated actors; but rather a process of negotiations between actors both inside and outside of the public sector. Decision making and information infrastructure are pivotal for discussing sustainable eGov, as these two aspects make up the backbone of eGov practice. They are also cross-cutting conflict dimensions that incorporate social, economic, environmental and technical aspects of sustainability. Decision making is interconnected with information infrastructure, as previous research and actors in my case studies perceived decisions about common information infrastructure to be pivotal in order for ICT to be used “as it should”, even though this is extremely hard to do in practice.

Decision making is hard, not only because of the structures involved, but also because of the different goals and underlying motivations for these goals; the different and often incommensurable positions of social, economic, environmental and technical aspects, which are sometimes interrelated but often clash.

The emergence of information infrastructure needs to be connected with decision making structures to support sustainable public practice. In the case studies in this thesis, I showed that the decision making structures were connected to a large number of problems related to information infrastructure. In relation to the review of literature on the sustainability issue in eGov research, it is clearly not an issue that is isolated to these case studies, but a wider one.

Hence, sustainable eGov is not about sustaining eGov initiatives, projects, e-Services or specific parts of information infrastructures in themselves. Sustainable eGov has to be about how ICT is used as a means to support public practice and, in the long run, to support a sustainable soci-
ety. In other words, decision making and information infrastructure needs to be responsive to continuous change and are at the same time aligned with public values, which are also evolving.

8.2 Implications, contributions and further research

As discussed above, eGov challenges current decision making structures. The implications of this challenging of borders can be interpreted as part of the “transformation” of the public sector that is enabled by eGov. However, whether such a transformation is, in fact, happening (or will happen), or is sustainable, is open for debate.

For eGov practice there is an explicit need to be able to plan, coordinate and implement eGov efforts that are not only responsive to short-sighted and local needs, but that also take into consideration the entire system; both in terms of seeing the public sector as a whole, and looking into potential future development. From a sustainability perspective it is important to highlight different areas in need of attention and discussion. Hence, researchers as well as practitioners need to think about eGov not only as a solution to specific needs, but as a continuous process of joint decision making and information infrastructure evolution.

A core problem is that decision makers often lack understanding of technology as something other than a neutral tool; thus, they often fail to see the need for coordinated planning and interoperability efforts. Hence, there is a need for decision makers on all levels to understand the meaning of such efforts, because a lack of political support often makes funding, implementation and coordination of eGov initiatives problematic.

How decision making should and could be done is a central issue for sustainable eGov. Which actors should be involved in planning, implementing, assessing and paying for ICT use? Which structures are needed and in which areas are coordination and directives needed? These are not simple questions. Whilst they do not lie within the scope of this thesis they are central issues which need to be understood and discussed if we (researchers and practitioners) are to be able to deal with what the future has in store. We, as researchers, need to take an active role in discussing the foundations of eGov.

By using the framework elaborated in this thesis, and the themes in it, the goals and roles of eGov initiatives can be discussed, with regards to what is focused, what is seen as less important and why this is the case.

Hence, the main contribution of this thesis for eGov research is its framework for sustainable eGov, which is theoretically elaborated and
empirically tested. Firstly, the framework includes both the technology dimension and the social, economic and environmental dimensions, which have been traditionally included in the TBL (Triple Bottom Line). Together, they make up a dynamic and socio-technical sustainability perspective. The framework also contributes by putting forward 21 themes, which can be used as a starting point for further theoretical elaboration as to what sustainable eGov ought to include. Furthermore, the two cross-cutting themes of information infrastructure and decision making are the backbone of sustainable eGov and are expected to provide fruitful input to further research. For instance, when looking at eGov initiatives, it is of great importance to ask how they contribute to or are problematic in terms of the emergence of information infrastructure or decision making structures.

In order to incorporate a dynamic sustainability perspective, eGov research should focus less on the sustainability of projects, programs, and specific initiatives in themselves, and more on eGov and society as a whole, including social, economic, technical, and environmental aspects. Research should also consider the interrelatedness between different sustainability dimensions, government levels and wider societal goals, and the changes these factors are subject to over time.

The framework elaborated in this thesis is indeed suitable as a starting point for discussing the interrelatedness of the sustainability dimensions as a dialogue of values. But the framework should not be seen as complete or final. Instead, developments, additions and refinements of the themes are encouraged. Hence, new themes can be added and the existing ones revised, with regard to different contexts and practices. This could be done in research and by practitioners. A suggested venue for future research would be to open up these kinds of discussions to action research, where a more thorough testing and elaboration of the framework, in particular, and the sustainability perspective, in general, could be performed. Furthermore, since sustainability is about long-term progress, there is also a need for further research with a longer time span, for instance following large-scale eGov initiatives over a period of 10 to 15 years.

This thesis focus of sustainability is clearly a broad one, highlighting first and foremost public sector ICT as eGovernance. In this sense, more specific studies on sustainability is also necessary; for example, research into the longevity of digital formats and standards is currently ongoing in Sweden and elsewhere. The specific research field of green IT also contains a large amount of research that is relevant for sustainable eGov. The point
of my research, as presented in this thesis, has thus not been to provide a detailed roadmap. This is just a starting point. The intention is to encourage discussions which serve to question specific eGov initiatives as well as eGov in general, with regard to goals and the way it does or does not contribute to sustainable public practice. I of course endorse my framework, which was elaborated as a tool for this. However, I also strongly encourage further elaboration, exploration and questioning by applying different approaches to an exploration of eGov sustainability as a dialogue of values.

My hope with this thesis is that it will provide the first steps of a journey down a freshly built road. On this road, the research community and practitioners can become better at defining and implementing eGov initiatives that support what we want to achieve today while not delimiting what we want to achieve tomorrow.
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