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eHealth, the future of healthcare
- A case study of effects and barriers

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Abstract

Title:	eHealth, the future of healthcare – A case study of effects and barriers
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Authors:	Carl Göök Alexander Miovic Jonas Tesfu
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Keywords:	Region Skåne, healthcare, eHealth, ICT, effects, barriers
Purpose:	To explain how the adoption of ICT influences the performance of the national health service and what barriers exist in the adoption of ICT from three perspectives; processes, patients and employees.
Methodology:	Qualitative data is used to investigate the effects and barriers of ICT adoption in Region Skåne's healthcare. The degree project has an inductive approach.
Theoretical perspectives:	The theories the thesis is based on are resource based view, value chain and change management theories.
Empirical foundation:	The empirical data is collected from interviews of eleven persons with various positions within Region Skåne.
Conclusion:	The adoption of ICT in the national health service has influenced the healthcare marginally. The main effects come from the digitalization of health records. However, it has arisen barriers in the adoption of ICT. The main barriers found are; lack of knowledge, norms & values as a source of resistance to change, lack of communication and lack of involvement of employees. Moreover, the security in the systems is also found as a barrier in the adoption of ICT in healthcare. Finally, the organizational structure is found as a factor that influences the whole process of ICT adoption.

Sammanfattning

Uppsatsens titel:	eHälsa, framtidens sjukvård – En fall studie av effekter och barriärer
Seminariedatum:	2010-01-15
Kurs:	FEKP01, Examensarbete magisternivå, 15 ECTS-poäng
Författare:	Carl Göök Alexander Miovic Jonas Tesfu
Handledare:	Carl Cederström Thomas Kalling
Nyckelord:	Region Skåne, sjukvård, eHälsa, IKT, effekter, barriärer
Syfte:	Att förklara hur implementering av IKT påverkar nationella sjukvården samt vilka barriärer som finns i implementeringen av IKT utifrån tre perspektiv; processer, patienter, anställda.
Metod:	Kvalitativ datainsamling har använts för att undersöka effekter och barriärer av IKT införande inom Region Skånes sjukvård. Studien har en induktiv ansats.
Teori:	Teorierna som studien baseras på är det resursbaserade synsättet, värdekedjan och teorier rörande organisationsförändring.
Empiri:	Empirisk data är insamlad från intervjuer med elva personer med olika positioner inom Region Skåne.
Slutsats:	Införandet av IKT inom nationella sjukvården har påverkat sjukvården marginellt. De huvudsakliga effekterna kommer från införandet av digitala patientjournaler. Vid införandet av ICT har det dock uppstått barriärer. De huvudsakliga barriärerna funna är; avsaknad av kunskap, normer & värderingar som en faktor för motstånd till förändring, brist på kommunikation och brist på involvering av anställda. Därutöver framkommer säkerheten i systemen som en barriär för införande av IKT i sjukvården. Slutligen är organisationsstrukturen en faktor som påverkar hela processen av införande av IKT.

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Lund, the 15th of January 2010.

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Definitions

eHealth: "The interaction between patients and health-service providers, institution-to-institution transmission of data, or peer-to peer communication between patients and/or health professionals. Examples include health information networks, electronic health records, telemedicine services, wearable and portable systems which communicate, health portals, and many other ICT based tools assisting disease prevention, diagnosis, treatment, health monitoring and lifestyle management"(eHealth for a healthier Europe, 2009).

Health record: Gives a complete summary of the health and medical history of a person.

ICT*:* Stands for Information Communication Technology and includes any communication device or application, encompassing; radio, television, cellular phones, computer and network hardware and software, satellite systems etcetera.

IT: Information Technology, see ICT.

National health service: The healthcare system in Sweden and healthcare systems with similar structure.

Region Skåne: One of Sweden's 20 county councils and the name of Skåne's county council.

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1. Introduction

The introductory chapter gives a background of the chosen subject and is followed by a problematization around the subject and this subsequently leads to the questions and aim of the thesis. The chapter ends with delimitations, choice of theories, target group and disposition of the thesis to give the reader a clear picture of the approach of the thesis.

1.1 Background

During the past decades Information Communication Technologies, ICT, has become a key resource in organizations from a wide array of industries and a driver of change in social and economic life (Hedman and Kalling 2002, p. 10). The rapid development of ICT has allowed the information society to emerge especially through the usage of Internet and other wireless communications (Wang et al. 2006). As information and communication technologies develop and become more available it opens up new opportunities in the healthcare sector among other industries (Törnqvist 2000). Since the healthcare sector is information and knowledge intensive it is becoming clear that progression in ICT will be strongly linked to the development of core activities in healthcare (Törnqvist 2000). Modern ICT now offers new possibilities for improving most aspect within healthcare, from better access to integrated information of patients' health, and with this delivering improved healthcare in its broadest sense (Juciute 2007).

As a consequence of increased life expectancy in the world it has become vital to incorporate the usage of ICT in healthcare to manage the escalating costs of healthcare (Murray and Lopez 1997), since increased usage of ICT in healthcare has long been thought as a solution to rising healthcare costs. ICT in healthcare has also been thought as a way to reduce medical errors (Adler-Milstein 2009). Today, medical errors are estimated to kill 98,000 people per year in the US (Hill and Powell 2009), which could be decreased by the usage of smart ICT systems.

According to UN global statistics the proportion of persons categorized as elderly will rise from 20 to 28 percent between 1998 and 2025. By 2050 the proportion of children will decrease by approximately 30 percent, while persons aged 60 years and older is estimated to double. It is difficult to speculate what effect these demographic changes will have, but UN global statistics estimates that chronic illnesses will stand for more than 60 percent of all

diseases worldwide by the year 2020. These anticipated changes in the demographic structure have pressured nations to find ways to rationalize their healthcare systems and consequently eHealth has become a high priority among the world leaders (Report of the WHO Global Observatory for eHealth 2009). In President Barack Obama's vision for the American healthcare reform, his administration estimates that adoption of electronic health records alone would save up to $77 billion annually (Adler-Milstein 2009).

In May 2005 The World Health Assembly adopted Resolution WHA58.28, which established an eHealth strategy for the World Health Organization, WHO. The resolution urged Member States to plan for appropriate eHealth services in their countries. The same year WHO also coordinated the first ever global survey on eHealth and the surveys overall aim is to further develop WHO's eHealth strategy of strengthening health systems (Report of the WHO Global Observatory for eHealth 2009).

During the Swedish EU presidency in 2009 eHealth was one of the central issues that were discussed and the Swedish government has the ambition to increase the awareness and collaboration of eHealth in the EU (The National Strategy for e-Health 2009). Internationally Sweden is seen as one of the world leaders in healthcare and usage of ICT in healthcare. In the Swedish National Strategy for e-health, eHealth is perceived as a way of increasing the efficiency and safety of healthcare and a way of increasing the patient's involvement in the healthcare process (The National Strategy for e-Health 2009).

The healthcare system in Sweden is financed through taxes and accounts for 9 percent of the Swedish GDP. The Swedish government establishes principles and guidelines for health and medical care and the 20 county councils in Sweden individually decide how healthcare should be delivered and planned. The county councils have under many years worked on developing and implementing IT support in healthcare. Today, 100 percent of Sweden's primary health and 92 percent of the hospitals are using electronic health records today (IT-stöd i Landstingen 2009).

1.2 Discussion of problems

The healthcare industry has been slow in the adoption of new innovations in information technology compared to other service industries, such as financial services and telecommunications ever since the computers were introduced in the 1960's (Parente 2000). However, the focus on ICT in healthcare has increased over the years. The implementations processes vary greatly, from single initiatives of various IT solutions to large national programmes (Juciute 2007). In 2006, the Swedish government launched a new national strategy for eHealth highlighting the importance of using information and communication technologies to bring about improvements for patients, health and elderly care, as well as for professionals and decision-makers (The National Strategy for e-Health 2009). Treatment of elderly people and citizens in need of professional care is one of the important aspects of today's society. As the demographic structure of the Swedish populations slowly changes this issue will increase in importance.

Earlier studies around the eHealth topic are Nikula (2001), Biselius (2007) and Kurtinaityte (2007). Nikula (2001) studied how electronic patient record, EPR, influences the healthcare organizations. In his dissertation from 2001, Nikula examines the medical and surgical departments at two hospitals in Sweden and how clinicians as well as management interpret and uses EPR. He uses a method of qualitative open-ended interviews covering the new technology of IT and EPR in regards to organizational change within the hospitals. Biselius (2007) investigates the implementation of ICT in healthcare from a leadership perspective. She examines the decision-making process and the most important phase for realizing the benefits from the implementation. Moreover, Biselius focus on specific IT projects in healthcare with focus on two case organizations. Biselius uses a broad spectrum of theories from the decision-making process and management of projects, to theories around corporate development. Kurtinaityte (2007) investigates the development of eHealth and compares Denmark (considered being a well-developed country in regards to eHealth) with Lithuania (a country considered to be in their initial stage of implementing eHealth systems). With a research question on how European countries uses ICT in their development of eHealth, Kurtinaityte (2007) uses theories as Porter's value chain, supply chain management, and customer relationship management in order to provide guidelines for other countries that strives to develop similar eHealth systems.

This thesis provides a new view on eHealth by examining the effects and the barriers in the adoption of ICT in the national health service by investigating Region Skåne's healthcare. The study contributes with a holistic view and in comparison to previous studies, theories such as resource based view, organizational learning and theories around resistance to change is used in order to get a deeper understanding on what effects and barriers that arises when adopting ICT in a healthcare organization. With a methodology of in-depth interviews from a broad range of respondents, all in different positions, this thesis takes in more aspects within the healthcare compared to the earlier studies by Nikula, Biselius and Kurtinaityte. This thesis explains what barriers healthcare organizations need to consider when working with ICT and what might hamper the further development within the healthcare sector.

The expectations on how ICT adoption in general can improve organizations are high and also the expectations for ICT adoption in the healthcare is high. Studies show that increased ICT usage in healthcare can improve the productivity, information for decision-making, quality etcetera (Skinner 2003). At the same time studies show that adoption of ICT also meets barriers (Parente 2000). Consequently, it is interesting to investigate what the actual effects of the ICT implementation has been so far and what kind of problems that have arisen. The idea is to investigate the effects and barriers from three perspectives: processes, patients and employees.

1.3 Research questions

- How has the adoption of ICT influenced the performance of the national health service?
- What are the barriers in the adoption of ICT?

1.4 Purpose

To explain how the adoption of ICT influences the performance of the national health service and what barriers exist in the adoption of ICT from three perspectives: processes, patients and employees.

1.5 Delimitations

The thesis is limited to study the healthcare sector in Region Skåne and the focus is on the effects and barriers of ICT adoption. The effects and barriers of ICT adoption are investigated mainly from three perspectives: processes, patients and employees. Even though no patients have been interviewed it is one of the perspectives. Instead the patient perspective is from the view of the people inside the organization. The reason is the difficulties to find a representative group of patients during the short period of time and also that patients may not have knowledge in all ICT solutions in use in healthcare. The thesis does not aim to quantify the effects of ICT implementation in figures, even though it could be an interesting aspect. The national health service in Sweden, hence Region Skåne is of non-profit character and therefore its target differs in comparison to a profit-driven organization, something that influences how the theories are used.

1.6 Choice of theory

Theories and views with different perspectives have been chosen, taking into account various factors. Also, strengths and weaknesses are different between them and there is not one specific theory or view preferable to the other. The resource based view is chosen to provide an understanding of the necessary capabilities needed for successful ICT adoption. It also investigates how the ICT adoption has affected the resources within the healthcare system. Moreover, the value chain discusses the different activities in the value creating process and the relation between the activities. The value chain complements the resource based view, where the value chain suggest that a successful composition of the value chain leads to successful organizations, which means that the interrelation and linkage between the activities is vital. The resource based view on the other hand states that it is the internal resources of the organization that are the key factor. Moreover, the value chain describes how resources are activated.

The resource based view and the value chain are complemented with perspectives of change management, including organizational learning that helps to give an understanding of important factors for an organizational change, such as the adoption of ICT. Besides the organizational learning perspectives of barriers in organizational change are included. Zander describes six common reasons for resistance to change and Kotter explains eight important

factors to overcome for a successful implementation of change. By using these theories of organizational change with the background of the resource based view and value chain, the authors believe a holistic dimension can be analyzed. From earlier research this perspective has not been taken into account, and therefore the authors believe that this thesis contributes to a new dimension of understanding of the effects and barriers of ICT adoption in healthcare. In the field of change management it exists an enormous range of different theories and perspectives. The theories and perspectives that are found most relevant to answer the aim of the thesis are chosen.

The authors are also aware of other theories that could have been complemented into the thesis. This thesis does not deal with individual learning in the sense of how the individual nurse or doctor acquires new knowledge within their field of expertise. By doing this, the thesis and interviews would have had to be expanded. The authors are aware of that the knowledge of the individual influences the learning of the organization but focus on learning from an organizational perspective.

A theory such as Porter's five forces was considered in order to understand the organizations position in the market. With the motivation that the case study is done toward a public sector, this theory was found not as beneficial in comparison to the chosen theories. Another theory that could have been chosen was Customer Relationship Management, CRM, in order to broaden the perspective since the authors are elaborating on the effects of patients and ICT. Considering the time frame and scope of the study this theory was not chosen. With the incorporation of CRM, the thesis needs to broaden the interviews in order to get the patient's perspective. As interviews are done with the decision-makers and high-ranked employees within the organization the patient perspective is from the view of the people inside the organization.

1.7 Target group

The main interest for this thesis comes from Region Skåne, other county councils, the national health service in Sweden and internationally. County councils can learn from each other to strengthen the healthcare in Sweden. A future vision is "one patient one health record", which will increase the need for cooperation between the county councils. The study can, as well, bring interesting perspectives to countries with similar a healthcare system as Sweden. For

example can less developed countries get new views and perspectives of how ICT adoption affects healthcare and what barriers to be aware of. Organizations that develop ICT systems can also be interested in this study, since it is interesting to see how ICT systems can be improved. Moreover, it is interesting with perspectives of the effects and barriers of the ICT adoption so far, in order to understand future creation of compatible systems for healthcare. Today most countries, county councils and even most of the hospitals have different ICT systems, which hamper the ability of good analysis and diagnosis in healthcare. Furthermore, the thesis is interesting for other stakeholders, such as employees and patients. Increased ICT adoption in the healthcare can have profound effects on both employees and patients, which uses the ICT systems.

1.8 Disposition

Chapter 2 clarifies the theories and views used as a basis for the thesis and a theoretical framework for the coming analysis. Possible advantages and disadvantages with the theories are discussed.

Chapter 3 explains the methodological considerations done in the thesis. Moreover, it consists of a discussion of the credibility of the thesis, with validity and reliability.

Chapter 4 begins with a presentation of the Swedish healthcare system and the case organization. Moreover, the empirical data collected from the interviews with the eleven respondents in Region Skåne is clarified.

Chapter 5 presents the analysis of the empirical findings matched to the theoretical framework from the theory chapter. Moreover, the chapter gives a proposal for new framework, which answers the aim of the thesis. Finally, the chapter discusses contribution and limitation with the new framework before it gives a proposal for further research.

Chapter 6 clarifies the references used in the thesis from literature, electronic and verbal sources.

Appendix

2. Theory

The chapter presents the theories and perspectives chosen in the thesis. It consists of a clarification of the theories and perspectives, including possible advantages and disadvantages. Finally, the theoretical framework is discussed, which is the base for the coming analysis.

2.1 Resource based view

The resource based view, RBV, was brought to attention 1984 with Birger Wernerfelt's in depth publication "A resource based view of the firm" and Barney's 1986 publication "Strategic Factor Markets: Expectations, Luck, and Business Strategy". These publications shifted attention to the inside of the firms, and to the resources and assets that were embodied in the firm. As the RBV incorporates the resource perspective, it is shifting the focus from the product and market focus to the resource side. The concept of competitive advantage is a central point in the RBV.

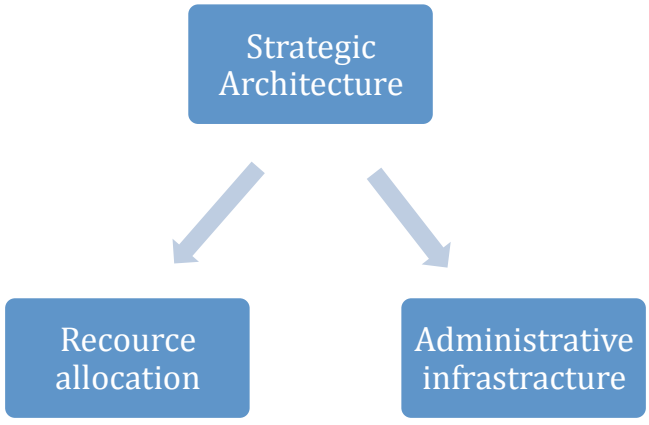
When mentioning competitive advantage it is important to distinguish it from sustainable competitive advantage. Competitive advantage can be defined as when a company is applying a value creating strategy not being implemented by a present or potential competitor. A sustainable competitive advantage can be defined as when a company is implementing a strategy not being applied by any competitor and when these other companies are unable to duplicate any of the benefits with this strategy (Barney 1986).

The RBV literature describes various resource attributes that will contribute to a firms competitive advantage. The frequently referred attributes in the literature are that a resource should be valuable, rare, costly to imitate and organized and distributed optimally internally in the organization (Barney 1994). Creation of competitive advantage will be created if a resource is valuable and rare, meaning that the resource should be valuable that it lowers costs or raises the price of the product. As Barney states a valuable resource *"enables a firm to conceive of or implement strategies that improve its efficiency and effectiveness"* (Barney 1991).

There are several definitions of resources, Barney (1991) states that resources can be physical, human, organizational or financial, it includes all assets, capabilities, organizational processes, company attributes, information, knowledge etcetera. These resources are controlled by the firm and enable the firm to create and implement strategies that improve its efficiency and effectiveness (Barney 1991). Amit and Schoemaker (1993) define resources as *"stocks of available factors that are owned or controlled by the firms"* (Amit and Schoemaker 1993). By using a wide range of other assets and bonding mechanisms such as technology, management information systems and labour, this will lead to the resources converted into a final product or service. In order to see that a resource is natured and distributes to the correct units and people within the organization, Barney (1994) claims it is important to have an architecture that structures systems, management styles and culture. A strategic architecture will provide a logic for which strategic moves a firm can make, hence a firm must identify which core competencies and their constituent technologies in order to cope with the future (Barney 1994).

Prahalad and Hamel (1990) believe that senior management should spend a considerable amount of their time developing a wide corporate strategic architecture, since this will enable objectives for competence building. Strategic architecture often refers to two components: resource allocation and administrative infrastructure, as figure 2.1 illustrates.

Figure 2.1 Components of strategic architecture



According to Prahalad and Hamel (1990) it is the consistency of resource allocation and the development of an administrative infrastructure that enhances the strategic architecture. This also creates a managerial culture, teamwork, a capacity to change, and a willingness to share

resources. The task of a certain strategic architecture forces the organization to identify and commit to the technical and production linkages across each business unit in the company. As a problem Prahalad and Hamel (1990) refer to the *"tyranny of strategic business units"* (Prahalad and Hamel 1990). Explaining the problem with many firms is the relative separation and autonomy between business units, which in turn leads to ineffective distribution and cross-fertilization of resources. While one business unit may be successful and reaches satisfactory levels in what they are doing the company as a whole might reach low achievements (Prahalad and Hamel 1990).

Capabilities in contrast to resources refer to a firm's capacity to deploy resources, usually in combination using organizational processes that will lead to a desired end (Amit and Schoemaker 1993). Amit and Schoemaker (1993) elaborate that capabilities are information-based, tangible or intangible processes that are firm specific and the capabilities are developed over time through complex interactions among the firms' resources. In comparison to resources capabilities are based on developing, carrying, and exchanging information through the firms' human capital.

Henderson and Cockburn (1994) distinguish two broad classes of capability that might lead to a competitive advantage: component competence and architectural competence. Component competences, also known as the local abilities and knowledge, are fundamental for the day-to-day problem solving. Henderson and Cockburn refer this to the resources of the firm, which will include knowledge, technical skills and technical system. They refer architectural competence to the ability to use the component competencies by integrating them effectively and to develop fresh component competencies, as they are required. Henderson and Cockburn refer this to the capabilities of the firm. Other concepts relating to the ability to foster and exploit component competencies are integrated capabilities, dynamic capabilities, organizational architecture, combinative capabilities, and managerial systems (Henderson and Cockburn 1994).

With a large focus on the inside of the firm, the RBV has received substantial criticism for only mirroring the industrial organization views that Porter (1980) brought up. Critics claim that in accordance with the SWOT analysis method the RBV balances the perspective, hence this reduces the value and applicability of the RBV. Priem and Butler (2001) mainly criticized the resource view for ignoring the demand side of resources, hence the product market, in

their bias towards studying the behaviour on factor markets. Priem and Butler (2001) elaborate that RBV theorists have argued persuasively that competitive advantage results from superior knowledge, or luck, or a combination of the two. In regards to superior knowledge Priem and Butler state, *"Efficient production with heterogeneous resources is a result of not having better resources but in knowing more accurately the relative productive performances of those resources"* (Priem and Butler 2001). The thesis focuses on resources and ICT as a resource, it also takes into consideration other theories that broaden the perspective, such as the value chain and the activities that will lead to superior performance. The thesis also studies the theories of organizational learning and change management in order to get a broader perspective of the effects and barriers of ICT usage in the national health service. Hedman and Kalling (2002) states, "*perhaps one should view the resource-based view as the other side of the coin that determines business performance"* (Hedman and Kalling 2002, p. 90), hence the RBV is used as a perspective and is complemented with other theories and views.

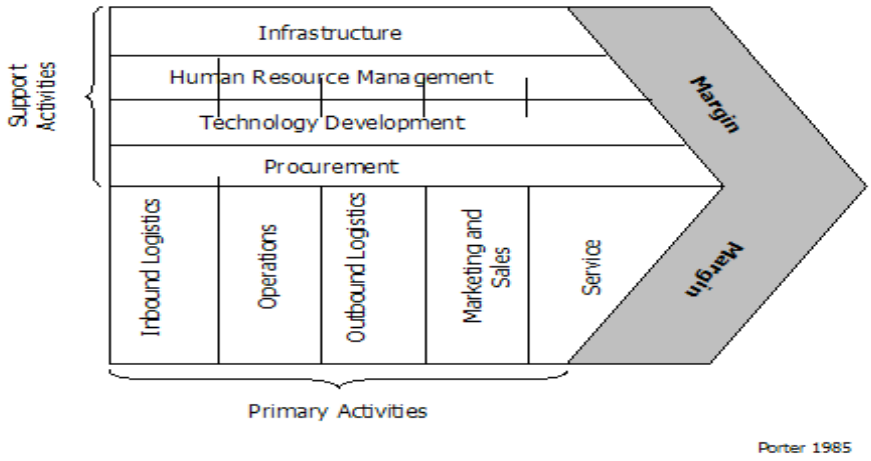
2.2 Value chain

Porter (1985) defines value chain as a linked set of value-creating activities. A value chain describes processes from the inputs to the delivery to customers. In a value chain analysis the firm is decomposed into strategically essential activities to understand how the activities influence the firm's differentiation and cost structure. A value chain has a broad perspective and is consequently good for monitor effectiveness and manage costs (Porter 1985, p. 39).

The interrelated activities in the value chain are divided into two broad categories, primary and support activities (Porter 1985, p. 38). Primary activities consist of the direct activities necessary to generate the final product and include inbound logistics, operations, outbound logistics, marketing & sales and service. According to Porter a source of competitive advantage can be more efficient or better-performed primary activities in relation to competitors. Higher quality is another source that can generate direct competitive advantage. The most vital activities differ depending on the industry type. For example, in an organization providing services, operations are more vital than outbound logistics, including storing etcetera, which probably is nonexistent. However, all the different types of primary activities will in some degree influence the competitive advantage of the organization (Porter 1985, p. 40).

Support activities are important to organize the primary activities and consist of infrastructure, HRM, technology development and procurement. Although, support activities all add value it is uncertain whether they can be a source of competitive advantage. The value chain model illustrates that the performance of the activities is reflected in the reached profit margin. Consequently, deep understanding of the individual activities and their interdependence are of importance (Porter 1985, p. 38). Figure 2.2 shows the generic value chain.

Figure 2.2 Generic value chain



Source: Porter 1985

A value chain analysis can contribute to a better understanding of an organization's strengths and weaknesses. Even though every single activity influences the competitive advantage it is the whole system of interrelated activities that affect the value creation. If the linkage between the activities is good the possibilities for sustainable competitive advantage are high (Porter 1985, p. 48). The perspectives of suppliers and customers are also of importance in the value chain analysis, since the value creation can be significant in these activities as well.

Information system technologies play an important role in the linkage between activities, as a reason of the information flow needed to coordinate and optimize the linkage. Porter states, *"Even though value activities are the building blocks of competitive advantage, the value chain is not a collection of independent activities, but a system of interdependent activities"* (Porter 1985, p. 48). Linkages within the value chain relate value activities and these linkages

are relationships between the way one activity is performed and performance of another activity. Identifying linkages is a procedure of finding ways in which the different value activities affects or is affected by others. According to Porter exploiting linkages requires optimization and coordination that cuts across conventional organizational lines (Porter 1985, p. 51).

The development of new information system technologies has influenced value chains profoundly (Porter 1985, p. 168). The choice of technology is important as a change of technology in one activity can impact other parts of the value chain. Change of technology in organizations can also influence suppliers and buyers. It can give new opportunities but also require more, for example in terms of knowledge and skills (Porter 1985, p. 169).

Even though Porter's frameworks and models are popular and widely used by academics and practitioners, Porter has received fierce criticism from RBV and from process-oriented researchers. Critics claim that Porter focuses too much on external factors (Barney 1991) and that he is too simplistic in the way he describes the connections in the value chain (Norman and Ramirez 1993). Critics further claim that Porter is too position- and planning-oriented (Mintzberg 1994). Even though some of the criticism is justified the value chain model is still highly relevant as a perspective in the thesis.

2.3 Change management

2.3.1 Process view

In order to understand the problems incurred in the process of developing and using resources efficiently, authors such as Hamel (1994), Sanchez and Heene (1997) and Kalling (1999) suggest that a holistic approach and a broader chronological scope should be taken into consideration when addressing the management of resources.

"A holistic approach takes into consideration not just the problems incurred in the use of resources but the whole history from the identification of the need to create a resource. A holistic approach focuses on the resource life cycle and also considers the effects of resource management on organization and activities and the position on the product market" (Hedman and Kalling 2002, p. 84).

According to Hamel (1994) management of resources includes selecting, building, deploying and protecting resources. Sanchez and Heene (1997) state that the process of resource management should be regarded as the basic creator of resources, hence the process determines the competitive position of the firm. Sanchez and Heene (1997) elaborates that resource management is a matter of both process and content and that the two are not voluntarily distinguishable.

The strategy process perspective came initially to focus on planning, decision-making and managing, mainly the cognitive challenges managers faced in formulating strategy. However, it also includes psychological and sociological views on the complexity of management. With the focus on strategy content, such as competitive position and the relationship between competitive position and performance, it was becoming less interesting in the relation to research. Although, it is interesting to find out how firms create the favourable positions or whatever characteristics that allows them to achieve them a particular level of performance. According to Chakravanthy and Doz (1992) the subfield is at the heart of all research in strategic management, *"The strategy process research subfield is concerned with how effective strategies are shaped within the firm and then validated and implemented effectively"* (Chakravanthy and Doz 1992).

By separating the subfield further from content-based research, Chakravanthy and Doz (1992) states that the focus is more on how the firm will reach the positions it has. Process research is concerned with the factors and variables behind positions rather than how the positions affect performance. Strategy process research also deals with the behavioural interactions of the individuals, groups, and/or organizational units, within or between firms in comparison to the strategy content. As Chakravanthy and Doz claim the strategy process subfield are more properly answered through *"longitudinal studies (cinematography) rather than cross-sectional studies (still frame photography)"* (Chakravanthy and Doz 1992). With the assumption that cross-sectional studies are only appropriate if the organizational studied is assumed to be in a steady state of adoption with its research (Chakravanthy and Doz 1992).

The thesis does not consider the organization to be in a steady state of adoption. Consequently, only looking at theories such as the RBV and value chain will not help to gain a deeper understanding on how the organization will be affected and the upcoming barriers in

the adoption of ICT. By introducing the subfield of organizational change theories, the authors believe to gain a broader knowledge in the strategy process.

2.3.2 Organizational change

"Companies have had to adjust from a world in which they only needed to make organizational changes from time to time to one where they must be prepared to make them almost continuously" (Child 2005, p. 277).

Creating changes in organizations is hard since there are many barriers to change and these barriers are often a cause to the many previous failed attempts. An organization consists of structures that determine the distribution of reward and power among the employees as well as organizational responsibility and accountability for work. The employees that have interest in preserving their organizational privileges as professional specialist or managers would be irrational not to defend them (Child 2005, p. 277).

Change comprises a disturbance that can have serious psychological implication and can provoke a negative reaction (Child 2005, p. 279). Child (2005) states, *"There is no disagreement that change is extraordinarily difficult to accomplish in organizations, and is indeed a hazardous undertaking".* According to Hatch (1993) it is normal that an organization is resistant to changes since the culture's stability does not like change and will remain the same until the management does something radical in order to change the culture (Hatch 1993).

There are different kinds of changes depending on if the change is expected or not, or if it is incremental or radical. Change can be a consequence of a merger, outsourcing, human and organizational developments etcetera. In table 2.1 the different types of changes that exist and their implications on the organization are clarified (Gordon 2002)

Table 2.1 Scope of change

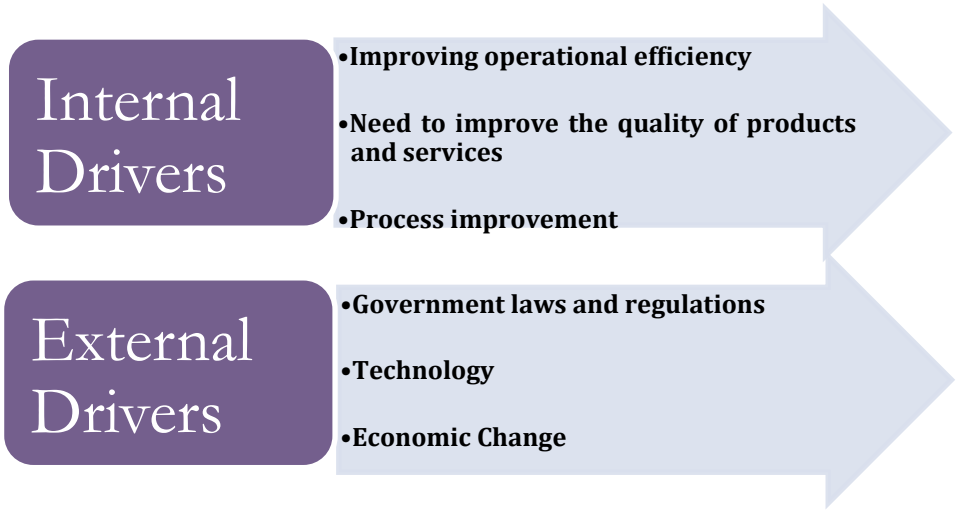
	Expected	Unexpected
Radical	**TUNING** (e.g., new policies, technologies)	**ADAPTATION** (e.g., new products or new feature)
Incremental	**REORIENTATION** (e.g., organisational redesign or reengineering)	**RE-CREATION** (e.g., new culture or total strategic change)

Source: Gordon 2002

2.3.2.1 Internal and external factors

There are two main sources that initiate and trigger change: internal and external factors. The external forces are categorized as changes coming from outside an organization, which force the organization to adapt. The internal forces of change refer to forces that have their roots in the organization. There are ranges of external and internal factors that may initiate change within an organization and in figure 2.3 some of the most common internal and external factors are summarized (Child 2005).

Figure 2.3 Internal and External drivers



Source: Dawson and Andriopoulos 2009

2.3.2.2 Organizational learning

The term organizational learning has been used to emphasize that organizations can acquire new knowledge and capabilities to improve their future performance (Child 2005). The expression organizational learning has gained much popularity over the last years as more companies and organizations consider themselves to be a learning organization. According to Dixon (1994) hundreds of large organizations have positions of *Director of Organizational Learning* (Dixon 1994, p. 218). Kang et al. (2007) state that organizational learning has become gradually more important as an instrument for establishing dynamic capability and strategic renewal (Kang et al. 2007).

Vera and Crossan (2003) give the following definition of organizational learning, "*The process of change in individual and shared thought and action*" (Vera and Crossan 2003). Child has almost the same definition of the term *Organizational Learning*, but has developed it a little bit more. Child gives the following definition of organizational learning, "*Organizational learning is the process of development in the thinking and actions of people belonging to, or working with organizations, which then becomes institutionalise properties. These properties take the form of new or revised routines, systems, structures, cultures and strategies*" (Child 2005).

Organizational learning is crucial to organizations and can lead to improved processes, new products and new services (Kalling 2007). Organizational learning perspective is used in the thesis to gain a deeper understanding of the critical factors in organizational change. This perspective is also used to understand how the organizational context has been affected by the ICT implementation.

In terms of key factors, it appears as if the factors behind successful learning can be grouped into cognitive, organizational and institutional factors (Kalling 2007).

- Cognitive factors such as the character of knowledge being managed, the character of the knowledge held by people managing knowledge, the ways in which firms combine knowledge heterogeneity while still nurturing core knowledge fields are of course important (Kalling 2007).

- Organizational factors such as understanding communities of practice, controlling feedback, control and supervision and managing the interface to the environment are of importance (Kalling 2007).

- Managing institutional forces such as the environment, the strategy of the firm, norms and values, and technology also influences learning (Kalling 2007).

2.3.2.3 Resistance and Barriers to change

Since it is difficult to implement changes in an organization there has been much research on barriers and resistance to change. Any organizational change is most likely to meet some resistance and therefore it is vital to understand why people are resisting, so managers can take the appropriate action (Child 2005). Two models are presented that focus on the main reasons for resistance to change and the common errors managers make in change process.

Zander (1950) was an early researcher on the subject of resistance to change. Zander perceives resistance to change as a behaviour, which is intended to defend an individual from the effects of change and believes that employees must be involved in change initiatives if an implementation is to succeed. He contributes with an interesting perspective for analysing change in organizations.

According to Zander there are six main reasons for resistance to occur in change initiatives:

- *Ambiguity in the mind of those who will be affected by change about the nature of change.*
- *Existence of diverse interpretations about the change and its impact.*
- *Existence of strong forces preventing individuals from changing.*
- *Strong top down imposition on individuals who will be influenced by change, lack of participation.*
- *Existence of personal interests directing change.*
- *Ignorance of pre-established institutions in the group* (Zander 1950).

Kotter (1996) has spent over 25 years studying change processes within organizations and has identified the 8 most common errors that occur. Kotter states, *"Leading change is both absolutely essential and incredibly difficult"* (Kotter 1996) and believes that many change initiative fail because too many managers do not realize that transformation is not an event, but a process. By understanding the different stages of change and the pitfalls that are unique to each stage one can enhance the chance for a successful transformation (Kotter 1996).

These are the most common errors:

Allowing too much complacency - Kotter believes that allowing too much complacency is one of the major mistakes an organization can make in a change process and something that single-handedly might become a critical error (Kotter 1996).

Failing to create a sufficiently powerful guiding coalition - Organizations that have little history of change or teamwork normally underestimate the need for such a guiding coalition. A guiding coalition should consist of five or more people with a commitment to improved performance. Kotter argues that short-term improvement can sometimes be achieved, however it is often short lived without an effective guiding coalition (Kotter 1996).

Underestimating the power of vision - Kotter believes that a vision is crucial and plays a key role when creating change. A vision helps to direct and inspire the actions of the organization (Kotter 1996).

Under communicating the vision - For employees to be willing to be helpful and even make sacrifices, they need to believe in the potential benefits of change and perceive them as attractive. Kotter also states that you cannot over communicate, but actions must be consistent with words (Kotter 1996).

Permit obstacles to block the new vision - Obstacles can be compensation or organizational structures that do not conform to new expectations. Kotter believes that new initiatives fail too often when employees feel disempowered by barriers, even though they embrace a new vision. These barriers must be removed to enable change (Kotter 1996).

Failing to create short-term wins - True transformation takes time, and if there are no short-term goals to meet and celebrate the change initiative risks losing momentum. If there are no short–term wins people will give up or actively join those who have been resisting change (Kotter 1996).

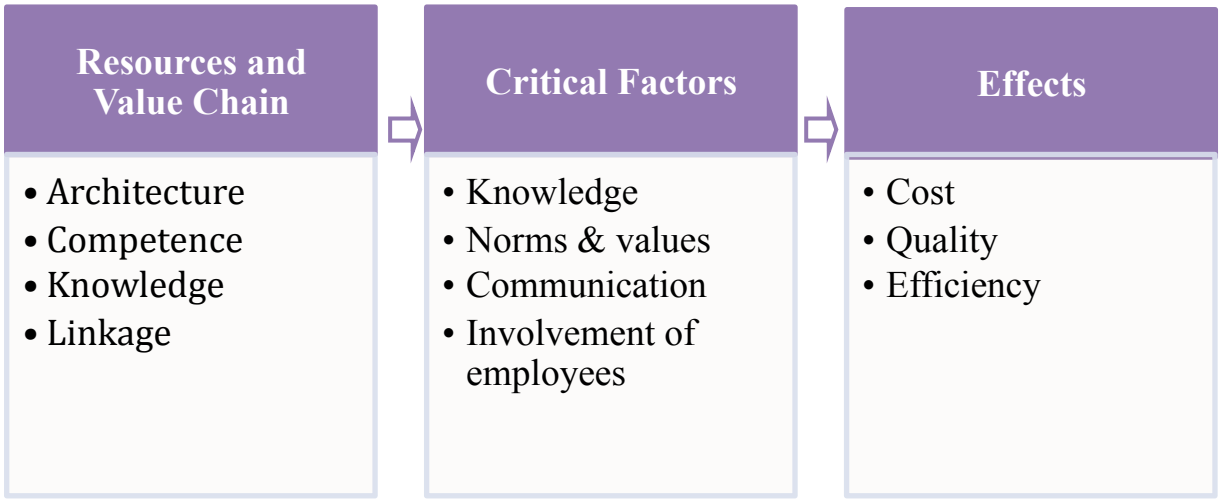
Declaring victory too soon - Celebrate a win is good according to Kotter but to declare that the war has been won can be catastrophic. Changes need to sink in and be part of the organizations culture, which takes time and new approaches are fragile and can easily be rejected (Kotter 1996).

Neglecting to anchor changes firmly in the corporate culture - Kotter states that change sticks when it becomes "the way we do things around here". Until new behaviours are rooted in shared values and social norms, the new changes will not be standing when pressure for change is removed (Kotter 1996).

2.4 Theoretical framework

The theoretical framework explains the relationship between the different theories and views used in the thesis. It is also used to illustrate why the theories have been chosen and how they can contribute to answering the research question. Figure 2.4 illustrates the theoretical framework.

Figure 2.4 Theoretical framework



The resource based view is used to gain a deeper understanding of the organization and key recourses of healthcare. Furthermore, the RBV is used as it gives a better understanding of how the internal resources have been affected by the adoption of ICT. Essential capabilities for the adoption of ICT as a resource from the RBV are architecture, competence and knowledge. Architecture enables the authors to conclude if Region Skåne has an architecture that enables them to get the most out ICT and the system in use. Within the architecture it is important to distinguish how well the resource allocation is handled and how efficient the administrative infrastructure is implemented within the organization. Administrative infrastructure is examined by looking at the structures and ways of how employees work with the systems; hence does the current infrastructure enable the employees to use their competence and knowledge in order to work efficiently. Building strategic architecture of the organization work as an enabler and facilitator of the desired goal and vision the firm needs in order to become successful. Examining the core competences enables the authors to see if the collective learning, hence knowledge, in the organization is present in order to coordinate the diverse production skills with the integration of the new technologies. Successful architecture will commit the organization and facilitate the transition towards change.

The value chain is used to see how the value creating activities have been affected. Since a healthcare organization consists of many activities, the value chain model can facilitate the understanding and effects of the ICT adoption. The value chain complements the RBV since it also take into account the interrelation and linkages between the activities. Conducting the research within Region Skåne, the authors investigate if linkages exist between the departments, if information is being shared over unit boundaries in order to create value. The authors also looks into how ICT has affected the linkages between departments, in order to create an understanding whether ICT always work as a facilitator or can ICT hamper the performance.

The national health service in Sweden and consequently also Region Skåne is of non-profit character. For that reason the effects chosen in the framework is to decrease the cost, improve the quality and efficiency, instead of competitive advantage as RBV and value chain discusses.

Change management is finally taken into account to understand how the ICT implementation process has affected the organizational context and to gain a deeper understanding for the processes that organizations go through as they change. Change is a complicated process and organizational change theories are used to better understand the outcome of the process. The critical factors are determined by analyzing academic literature in organizational change. Knowledge, Norms & Values, Communication and Involvement of employees are the critical factors that organizations must overcome for a successful adoption of ICT. Knowledge as a critical factor is about how knowledge is created, spread and used in an activity. Knowledge is important to consider since organizations need to ensure that the employees have enough knowledge to operate the implemented systems. Norms & values as a critical factor are about the organization's ability to take in new changes. The organizations norms & values is a prerequisite for adapting new ideas and changes and the norms and values of an organization are in many cases a change resisting force. Norms' & values' impact on the ICT adoption is examined.

Communication is a critical factor and vital for the organization in many ways. The vertical and horizontal information sharing in the organization is investigated together with the communication within the departments. The communication of the vision is also important to investigate. Absence of employee involvement is considered by theories in change management to be a source of resistance to change and is therefore important to investigate. Lack of involvement is when employees do not have the possibility to influence the decision-making and the adoption process. These critical factors have been chosen since they capture the crucial aspects of theories in organizational change.

The first element of the framework is used to facilitate the analysis of the organization, where the focus is on the organization's important resources and capabilities. This is to gain an understanding of the organization and its vital resources and capabilities. The second element of the framework is used to facilitate the identification of barriers. Since many barriers are the symptom of the same problem some of the critical factors are affected by each other. The third element of the framework is the impact of implementation and is affected by the first two parts. The effects from the ICT adoption will be greater if the organization has the necessary capabilities, and if it manage the critical factors. The theoretical framework is the base for the coming analysis.

3. Methodology

The third chapter focuses on the choice of subject together with the methodological considerations. Moreover, the character of data in the study is clarified and there is a discussion of the credibility of the method and data used. Finally, the empirical and analytical method is discussed.

3.1 Choice of subject

Sweden has one of the most developed healthcare sectors in the world. With a leading position and a constantly growing ICT spending in the healthcare it is interesting to investigate how the ICT adoption has influenced the performance of the national health service and what the barriers are in the adoption process. To get a deeper understanding of the issue a case organization is chosen, Region Skåne's healthcare. Region Skåne is chosen, as it is a respected and a well-developed healthcare institution in Sweden. An advantage with Region Skåne is also the relatively easy access, since the thesis is limited in terms of time.

3.2 Choice of method

This part clarifies the methodological approach to understand the procedure in the thesis. The approach, method and target must be decided. The method used for collecting information is chosen to match the problem. The method of the thesis is classified as normative or descriptive, depending on the target the authors has for the study.

3.2.1 Qualitative approach

A qualitative approach is used to collect the empirical data, primary in terms of interviews with persons within Region Skåne's healthcare sector. The interviews are the base for the empirical data. The reason for using a qualitative approach is that it leads to a deeper and more detailed understanding of the situation. Moreover, the respondents can give specific and unique information about the situation. However, the more unique and specific information in the qualitative approach can also lead to a more complex data, which complicates the analysis. An additional drawback is the resource-demanding aspect. Deep interviews are often time-consuming (Jacobsen 2002, p. 143) and as a reason of that the respondents are limited to eleven individuals.

A case study is preferable when the target is a deeper understanding of a specific situation (Jacobsen 2002, p. 97), such as the ICT adoption in the national health service. An advantage with the case study is the possibility to investigate many aspects in Region Skåne's healthcare compared to superficially investigate a couple of aspects on numerous cases (Eriksson and Wiedersheim-Paul 2001, p. 106). However, the possibility to generalize the results is more difficult in a case study, hence it is a consideration between relevance and possibility to generalize (Jacobsen 2002, p 103). Even though the results from the study are difficult to generalize, the study can bring relevant perspectives.

The reason for not using a quantitative approach is as it simply gives a superficial picture and not a deep understanding of the situation (Jacobsen 2002, p. 147). Nonetheless, a quantitative approach could lead to many interesting aspects, for example by using a questionnaire for a larger population instead of the eleven qualitative interviews in the study. It would be interesting to compare the results from a quantitative approach with the qualitative approach used in the study. However, the thesis is limited in terms of time and therefore focus is only on a qualitative approach.

3.2.2 Inductive method

The study is primarily based on empirical data collected from personal interviews. An inductive method is in line with the qualitative approach used for the data collection. Even though, it is difficult to collect information without any expectations the method used is inductive, since it is a new subject and situation for the authors. An inductive method gives possibilities to find more relevant data than a deductive method, as the author in a deductive method often search for the information he finds relevant (Jacobsen 2002, p. 35).

The method has some inevitable deductive elements as well, since it is impossible to collect information without any expectations, the interview guideline is based on the theory and the analysis is done from perspective of the theory (Jacobsen 2002, p. 35). However, the thesis has mainly an inductive method.

3.2.3 Descriptive study

The study has a descriptive approach, where the first research question aims to explain how the adoption of ICT has influenced the performance of the national health service from three perspectives: processes, patients and employees (Jacobsen 2002, p. 73). The study aims to explain the effects of the ICT implementation and leads to an analysis, which explains what the effects of ICT adoption has been on the national health service.

The second problem aims to explain what the barriers of ICT adoption has been in the national health service, hence a descriptive approach. The intention is, by including the explanation of the first issue, to be able to explain the barriers arisen.

3.3 Data

In the thesis both primary and secondary data is collected. The primary data is the new data collected from the interviews and the secondary data is the existing data, which the authors find relevant for the thesis (Bryman and Bell 2003, p. 212).

3.3.1 Primary data

Primary data is used to investigate what effects the adoption of ICT has had on Region Skåne's healthcare and what barriers that have arisen in the adoption of ICT. The primary data consists of interviews with individuals within Region Skåne.

Open individual interviews are used, as they give more specific information and a deeper understanding of the situation compared to questionnaires (Eriksson and Wiedersheim-Paul 2001, p. 86). It is interesting to see the respondents' different specific views of the situation. The interviews are primarily in face-to-face situations to better understand the limits of the respondent and easier get the correct information. The interviews are during one hour with each respondent. Unfortunately, it was not possible to meet Åsa Schwieler for a personal meeting due to the shortage of time. Instead, Schwieler was interviewed by phone. A disadvantage of the personal interviews is that the interview effects may impact the interviewer and the respondent, hence lower the reliability (Jacobsen 2002, p. 162).

The interviews are of semi-structured type, where the interviews are done with a predetermined sequence of questions (see appendix A), but with open answers. An advantage with the open approach is the interviewer's possibility to ask supplementary questions if something interesting turns up. This leads to a higher flexibility in the interview situation. Most important is consequently not the specific questions, but instead the topic and problems to discuss. Too structured interviews are sometimes said to limit the qualitative approach. However, a risk with doing interviews without structure is the possibility the data becomes too complex to analyze (Jacobsen 2002, p. 163). The intention with the interviews is to collect a large quantity of data and then find the relevant data to be able to meet the aim of the thesis.

The respondents are chosen with respect to their knowledge and position within Region Skåne. Respondents are chosen with different knowledge and positions to get a more objective and broad perspective of Region Skåne's healthcare (see appendix B). A risk with choosing respondents from one single department, such as the IT-department, could have been the subjectivity within the department.

3.3.2 Secondary data

In the study secondary data is used as well. The secondary data is important as a complement to the primary data. The secondary data consists of scientific articles and studies together with material found in Lund University's available databases, such as Lovisa and ELIN@Lund.

3.4 Criticism of sources

The credibility of the study is investigated with validity and reliability. To sustain high levels of validity and reliability several precautions must be taken. Validity is about the ability to measure what is intended to measure and for high reliability the study must give trustworthy and stable results. The validity is the most important demand, as without validity it does not matter if the measurement is of good quality (Eriksson and Wiedersheim-Paul 2001, p. 40). This part ends with a discussion of credibility of the secondary data.

3.4.1 Validity

Validity can be divided into two types, internal and external. In case studies the possibility to generalize the results is limited, especially when studying one single organization (Jacobsen 2002, p. 266). Instead the focus in the thesis is to in depth investigate the situation in Region Skåne's healthcare. Consequently, the external validity is not sought even if the study can bring interesting perspectives.

The internal validity on the other hand is often high in case studies (Bryman and Bell 2003, p. 288). In the interviews the internal validity is ensured by critically choosing people with good knowledge about the situation. Choosing respondents with first hand information also ensures the internal validity (Jacobsen 2002, p. 260). A risk is that the respondents are not giving all the information, because of the fear of criticising the organization. To avoid that problem the respondents is offered anonymity. The respondents are also chosen from different parts of the organization and with different involvement to get individual interpretations and a broader perspective of the situation. The questions in the interviews are formulated in a defensive way to minimize the risk for the respondents to feel pressured and get into defensive positions. The results from the interviews are finally compared to other similar studies and theories to ensure the internal validity (Jacobsen 2002, p. 258).

3.4.2 Reliability

To sustain high reliability through the whole process and minimize the risk the methodological approach influences the results, the authors has an objective perspective in the study so far it is possible. Consequently, the interview effect is as small as possible (Jacobsen 2002, p. 270). At the same time as an objective perspective is aimed the subjective information can be the most interesting. However, the study does not include any subjective views from the authors without a clarification.

The interview effect is minimized with a clear structure of the interview process, as there are different interviewers in the study. The first interview is done together to get all the interviewers towards the same direction. Moreover, the interviews do mainly take place in a natural place for the respondent, such as her office, to reduce the context effect (Jacobsen 2002, p. 271). Negligence in the data collection in the interviews avoids by tape-recording.

3.4.3 Criticism of secondary data

The secondary data is collected by other people and for other reasons. Based on these arguments the credibility of the secondary data may be questioned, as lost control of the original source. When collecting secondary data it is of importance to examine the sources. To ensure the quality of the secondary data, the sources used are critically examined during the process and highly respected sources are prioritised.

3.5 Choice of empirical and analytical method

The empirical and analytical method of the thesis is based on Yin (1994) *"Case study research: Design and methods"*. Identifying the accounts of empirical data is ultimately a subjective choice. The authors have however done the outmost to make it representative and at the same time informative. The authors strive to reach high reliability by inter-rating of interpretations, cross-checking of accounts and triangulation of information sources. Further on, the analysis is divided into three parts: applying the framework, proposal for new framework and analytical generalization. In applying the framework part the theoretical framework of the thesis is matched to the empirical findings (Yin 1994). In the proposal for new framework, the new framework is explained and new learning from the empirical findings is added to the framework. The proposal for new framework addresses the aim of the thesis. Finally, the analytical generalization discusses the contribution and limitation with the new theoretical framework compared to earlier theories and studies.

4. Empirical data

This chapter starts with a presentation of the Swedish healthcare system and the case organization. Moreover, the empirical data from the interviews is clarified. First, the current situation is explained and then the information from the interviews is clarified. The chapter ends with a summary of the key findings in the empirical data.

4.1 Presentation of Swedish healthcare system

The Swedish healthcare system consists of 20 county councils. The 20 county councils are responsible for hospitals and health centers, while the 290 municipalities provide municipal care (Homepage of Swedish healthcare: http://www.swedishhealthcare.se). Even though the healthcare system in Sweden is highly decentralized, healthcare policy is a national-level responsibility. The main responsibilities of the healthcare centers in Sweden are to provide a high quality, high standard and accessible healthcare to all citizens living in the counties (The National Strategy for e-Health 2009). In Sweden, the county councils and municipalities are also the main providers of healthcare, with the private providers only delivering about 10 percent of all health services. Healthcare in Sweden costs on average 9.2 percent of the country's GDP and 70 percent of healthcare services are funded through local government taxes (Homepage of Swedish healthcare: http://www.swedishhealthcare.se).

4.2 Presentation of case organization

Region Skåne has over 33,000 employees and is responsible for the healthcare in southern Sweden, which includes the primary care, specialist care, as well as for ambulance care. Of the 10 hospitals in the Region Skåne, nine hospitals are public and one is private. There are approximately 1.2 million residents in the region and 33 municipalities, which accounts for about 13 percent of Sweden's total population (Region Skåne's homepage: http://www.skane.se).

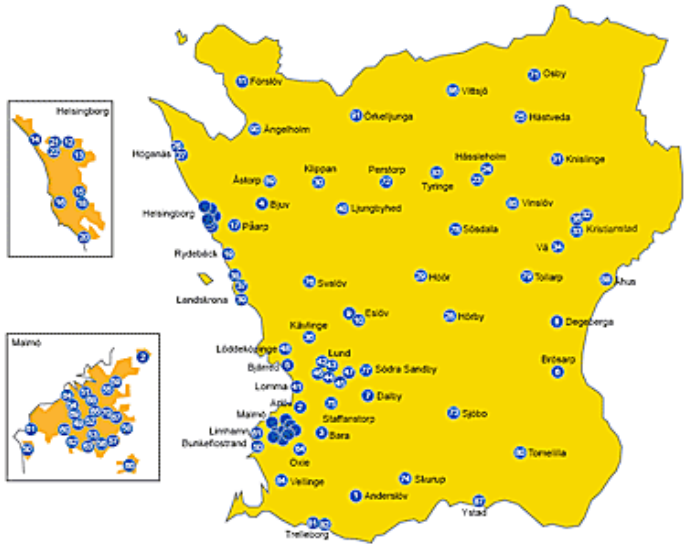
The healthcare organization in Region Skåne was largely built up to meet the demands and needs that emerged on the 60- and 70's. During the last 30 years the developments in the medical specialties, pharmaceuticals, ambulance services and medical field has developed greatly. These developments, together with today's challenges, not least the increasing elderly population, and citizens' growing expectations of care, require that healthcare in Region

Skåne needs to change fundamentally (Pressinformation Hälso- och sjukvårdsnämnden, 2008-09-28).

The healthcare in Sweden is currently undergoing major changes, as care is moving towards becoming more patient-driven. From the first of May 2009 the residents of Region Skåne have the right to choose its healthcare provider, which makes the primary care more market-oriented with more competition. This is called “Health choice Skåne” and pressures the different care providers to improve how information is exchanged between and within care units in primary care. “Health choice Skåne” as a reform is anticipated to have a significant impact on the entire social structure and particularly for the players in primary care. Both the perception on the own organization and citizens' demand for care will most likely change. Factors that previously have not played a role may prove to become significant for the individual care unit (Pressinformation Hälso- och sjukvårdsnämnden, 2008-09-28).

Information technology plays a vital role, which can contribute to a more efficient communication of data and information between and within organizations. There is a great challenge though since information that previously rested with the public health departments now must be moved between both public and private care units.

Figure 4.1 Primary care facilities in Region Skåne



Source: Region Skåne’s homepage: http://www.skane.se

4.3 Current situation

ICT in Region Skåne has developed over the last 10-15 years. Until 2007 as a centralized IT department was set up, each department, clinic and hospital had responsibility for its own IT spending. The director of the department together with his IT department handled decisions regarding which systems to use. This resulted in many different ICT systems within Region Skåne's healthcare. Many of the respondents talk about a situation of "Thousand flowers blooming", meaning that it exists too many different ICT systems between the departments, clinics and hospitals. It is interesting to see how Region Skåne's healthcare has been affected by the change to a centralized IT department, from previously having IT controlled by each single department.

According to Hammar Region Skåne today has a greater maturity and understanding within the different departments that ICT spending needs to be coordinated centrally. A single department can make suggestions on functions that the systems must have, but they can no longer decide which systems to implement by themselves. The focus is currently on consolidation and standardization of the ICT systems to decrease the number of systems and increase the efficiency in the usage of ICT. The Swedish national strategy for eHealth will contribute with an objective to minimize the different kinds of ICT systems and achieve a mutual strategy for the ICT usage. As a simple example Kraft describes that there exists four or five different salary systems within Region Skåne today, which of course should be one. The respondents state the focus in the healthcare today is *"One patient, one health record"*.

4.4 Effects of ICT adoption

4.4.1 Digitalization of health records

"Healthcare today is about information management"

- Olof Jarlman, Director of radiology department

Jarlman believes that information management plays a crucial role in healthcare, as one of healthcare's most important concerns is to make the right diagnosis. Jarlman believes that ICT systems help to provide a better basis for decision, even though the expected effects are not reached. The objective with the ICT adoption is to achieve more efficient processes and

higher accuracy in the decision-making, something that will enhance the quality in the long run. Bengtsson also reasons around the increased information from ICT and suggests that the introduction of digitalized health records has contributed to an increased availability of information. The information is always available and does not need to be sent between the hospitals in advance.

> *"Digitalization of health records leads to better logistics in the information distribution"*
>
> - Rolf Bengtsson, IT strategist Region Skåne

This is something that Bengtsson believes leads to a better cost-efficiency in the long run. Kraft agrees with Bengtsson and believes that the digitalized health records have improved the processes. She states, *"Before it was a lot of taxis driving around between hospitals with the paper health records"*.

The digitalization of health records has resulted in that employees no longer need to run around and look for health records. In regards to the documentation of health records, ICT enables a documentation that is gathered and collected in one place. Andersson elaborates that this has increased the safety of the patient and eliminated the error of double registrations. The benefit of not having to transfer vital information from paper to paper also eliminates the room for misinterpretation. Andersson states, *"The accessibility of information has increased and this means a lot"*. It is clear that the implementation of electronic health records have given effects. However, the big effects will not be possible without systems that are able to communicate. One of the main problems before was that vital information could easily be lost. Andersson elaborates that a better accessibility of information with the electronic health records provides a better decision support and faster access to relevant information.

Swanstein agrees with Andersson and believes that the digitalization of health records has decreased the number of health records that normally disappears, instead problems are with the ICT systems being down or that the network is overloaded. The authors identifies that the digitalized health records have had a significant effect on the health care sector, since care has become safer and more efficient. Even though most of the systems cannot communicate, digitalized health records is still considered to have had a significant effect on the healthcare sector.

4.4.2 General effects

Andersson believes that in addition to the digitalization of health records the ICT implementation has influenced referral and response, where the handling time has shortened drastically. Hammar agrees with Andersson and state, *"In 2006 a survey was made in Region Skåne, where we measured how long it takes, on average, for a referral to leave the health centre and the time it takes for the referral to be received by a doctor on the orthopaedist department. It took on average 16 days before the referral left the health centre and it took on average 14 days before an orthopaedist doctor at the clinic, sat down and looked at the referral. Overall, it took 30 days in total and this is something that could be done in two hours if it was done electronically."*

There are many opportunities to improve the processes within care and making them more efficient and cost saving. This is a good example since it allows one to grasp the endless possibilities with ICT usage in healthcare. The progress seems to have been rather slow even though the potential is big. Andersson states that new ICT systems make changes in invoice processing time, which has been simplified and shortened. All of this is adding up to an increase in efficiency and rationalization. Andersson believes that with the introduction of e-prescriptions the hospital have seen a safer, faster, and more convenient process.

Olofsson states that the improvements of increased ICT adoption are better quality control, better patient information, and safer medication management. It has also become easier to monitor the quality and performance of healthcare. One example that Olofsson mentions is a simple system that indicates where there are vacant beds. A system like this enables Region Skåne to better allocate the internal resources and decrease the queues. Hammar reasoning is in line with Olofsson's, that patients now receive safer care with better positioning and quality as a result of ICT. Hammar also mentions a web service called *Klamydia på webben.* Two years ago, Region Skåne introduced this web service where people could order Chlamydia tests through the web. After three months it was more people who tested themselves over the web than in the youth clinic.

Swanstein believes that there are some functions in use today that has improved care. One of these special functions is "Akutliggaren". This function facilitates the work of the emergency room, where the employees can track where in the process the patient is located. This enables the staff to have a comprehensive picture of the process and have improved the day-to-day

work for the employees. Another function is one that informs the employees when a patient is done with a test, which enables the clinic to become more efficient.

Swanstein does not believe that the patients have been affected to any great degree from the ICT adoption. Nonetheless, he believes that the introduction of IT based features like "My healthcare contacts" facilitates the care process for patients who use the service. By "My healthcare contacts" patients can order electronic prescriptions, order or cancel doctor visits, order reminder through SMS and ask questions. Hägglin believes that a positive effect with IT today is the communication with patients and she also talks about "My healthcare contacts". Hägglin believes this is a good complement to calling the clinic whenever an issue occurs. "*It is good when you find solutions where they are really needed and not just put IT solutions where they are not needed."* Moreover, Jarlman suggests that IT has high potential in communication with patients. The possibility to ask questions and discuss with the doctor in advance decreases the time the patients spend on the hospital and decreases the queues in healthcare. Kraft and Ranklev have the same reasoning and they see a great potential for consulting services with IT. Bengtsson believes that better and fewer ICT systems will benefit the doctors, as they will have more information available for taking the right decision.

Ranklev chooses to highlight a different perspective and states that the production capacity in some areas has gone down, since it has become more time consuming with the different IT systems where you need to log in and enter things.

> *"It has worsened productivity with systems that are clumsy. It is a combination of factors, from login to signing practices where systems are not smart enough and also that systems do not provide the comprehensive support. This shows that many of IT systems used today do not support the processes."*
>
> - Eva Ranklev, Chief doctor at the University hospital in Lund

Christenson also has a different perspective and believes that the systems in use today only facilitate parts of the process, but there is no system that supports the entire process. Today, the employees can read health record digitally if allowed access, but there is much left to develop when looking at it from a process perspective. Christenson states, *"The IT system of tomorrow supports the entire process, not only parts of the process"*.

The authors have acknowledged that the biggest effect of the ICT adoption has been the digitalized health records. There are some smart functions and services that have been developed, but these effects are limited to size or to a specific department. The authors believe that integration and coordination of systems need to be completed before the patients and employees will explore the effects of ICT. The authors also agree with Christenson that the objective should be a system that supports the whole process but the question is whether it is possible to have one system that supports everybody's need.

4.5 Barriers

4.5.1 Standardization vs. Customization of systems

According to Hammar the ICT implementations have improved some processes, but some processes have also become more costly and created extra work. Hammar states, *"One aspect is that the ICT implementation has been costly and created extra work, but the objective is to make it saving and efficiency improving"*. The healthcare in Sweden has had too little standardization of the ICT systems, and the philosophy has been to *"let a thousand flowers bloom"*. This has resulted in the many ICT systems that are in use today, with various health record systems, various safety systems and different technical infrastructures. This has created many of the complications in communication that exist today since the developed systems are not convertible. *"Today the primary care in Region Skåne uses four health record systems, but it was not long ago, that the University Hospital in Lund alone used five different systems."* Schwieler has the same opinion as Hammar and states that there are many different systems in use today with different structures and therefore the systems are not able to communicate with each other.

> *"When we started the various IT projects in the healthcare system in Sweden, no one knew the communication possibilities that would manifest itself."*
>
> - Åsa Schwieler, Project manager National Information Structure

The problem with the integration of the different IT systems is something that most of the respondents have identified as a main challenge. To increase the efficiency of the ICT usage the integration of the systems are necessary. Christenson believes that the challenge now is to find common solutions. *"My view is that it is much left to do, but that there is a gradual*

development". She further claims that healthcare today is extensive, and the different clinics and hospitals believe they have very specific needs and therefore require their own systems. Even to agree on a common health record system in Region Skåne is a big challenge, even though it is now moving in the right direction. *"Imagine implementing the change on a national level."*

The respondents' views regarding barriers vary between the respondents. According to Bengtsson the development of the different ICT systems has decreased the possibility to use ICT efficient. Bengtsson explains that within Region Skåne an absence of integration between the systems exists and a lack of standardization. This hampers a successful usage. He claims, *"It is of high importance to have the information in the same format"*. Ranklev also stresses the importance of having standardized integrated systems, where employees should be able to collect the data for such as quality recording. Ranklev wants a greater use of decision support in the ICT system and thus greater safety, *"It must be difficult to make mistakes"*. Ranklev elaborates that you may not need one single system that covers all parts, radiology may have one system and another department may have a different system. The crucial factor is to integrate the different systems, so that the user perceives them as one system. Today, many of the systems in Region Skåne are not that well designed, so there are many improvements that can be done. Anderson's reasoning is in line with Bengtsson's and Ranklev's. Andersson believes that communication between departments and their different needs is essential to overcome this barrier.

Hammar believes that there exist 150 databases in Region Skåne. This is the result from when all departments developed their own IT systems. When they developed the systems, there was no requirement that the systems would be convertible to other databases and consequently the systems have found it difficult to break through. Today, systems are developed to be able to pick up information from the systems that are already in use, which Hammar believes will decrease the need for everybody to have the same system. *"Today, Region Skånes yearly spending on ICT in the healthcare sector is about one billion SEK, representing approximately four percent of the total costs. Consequently, it is vital to look at how the money is used and not how much money you spend."*

The lack of coordination in the implementation process of the previous systems is obvious and the authors agree with Hammar that the focus should be on making the systems able to

communicate rather than focusing on implementing the same system for everybody. The authors concur with the respondents that the standardization of data and integration of systems are vital for an efficient usage of ICT. Region Skåne is in a phase where the main focus is to integrate the many systems in use. The challenge now is to find common solutions, which can be difficult since the different departments are used to make their own IT decisions.

4.5.2 Organizational structure – Centralized vs. Decentralized

Jarlman describes another barrier, he believes that the more centralized IT decision-making has led to slower adoption of new ICT solutions. Since all contracts and agreements are made centrally the adoption of new ICT solutions demand more time. *"We are too slow in absorbing new technologies"*. The reason is that the centralized IT group has many issues to deal with. A new technology will therefore often not be prioritised among the other bigger issues. Jarlman believes, *"A problem is that Region Skåne has not found a way to affirm the enormous development while maintaining good order."* Ranklev also discusses this problem and she believes that since it is the centralized IT department that makes decisions about which system to use, there is a need for a better dialogue.

Hägglin says it has been decided from Region Skåne that all clinics at the hospital will use the same digitalized health records in order to have the same system. Hägglin claims, *"The system is perhaps not the best"* and continues why, *"I do not think it is the right way to go when all the clinics should work in the same way."* According to Hägglin this will not be efficient for anyone, since each clinic has their own patients, conditions and work practices. Requiring everyone to work in the same way is not efficient. She suggests a core system that is common for everybody, but where each department has the opportunity to adapt the system to its specific needs.

> *"When the IT department incorporate a central system, which is determined from the outside, I have troubles to identify any gains, since the employees cannot influence and adapt the system toward their preferences".*
>
> - Åsa Hägglin, Strategic stab University hospital in Lund

Ranklev agrees with Hägglin and believes that many clinics have found themselves in a situation where they cannot do what they want. Around 80 percent of the clinics have similar needs but there are clinics that require some flexibility, such as eye clinic and surgery. However, Swanstein has a different view of the problem. He states that a barrier has been who the "service owner" is, since various directors have owned various service systems in the past. The Finance Director was responsible for the accounting systems used and the health director was responsible for the systems used in healthcare. Previously, each director could buy systems that they wanted, but this must now be coordinated with the centralized IT department. Swanstein believes that this change has contributed to a greater focus on the whole healthcare and not only on the specific department. By looking at decisions from a group perspective, it is easier to coordinate the work with a common system. Christenson agrees with Swanstein and states *"A problem lays in the difficulties for all parts to put their business in a holistic way and it will require a substantial work to achieve common solutions."* She claims, *"A major challenge is to organize care from a patient perspective, not from a production perspective. You cannot look at each clinic or department by itself; instead you need to see the healthcare system as a whole"*.

The authors see two clear sides among the respondents of how an optimal IT system should be organized, where one side wants a centralized and standardised system and one side wants a system that is more flexible and customised to the specific needs. An interesting observation here is that the side wanting flexible systems is the people working with the systems on a daily basis in the hospitals, where as the other side promoting a centralized system are working in management positions. The authors identify that organizational structure have played a vital role in the ICT adoption and believes that a centralized IT department is crucial to solve the integration problem that exists in Region Skåne today. Communication plays a vital part and it is essential that the centralized IT department has a good channel of communication to the different departments and clinics.

4.5.3 Security issue

Olofsson believes that one of the big challenges is to develop a secure system that enables information sharing, so that a person who has jurisdiction can look up specific information about a patient no matter the geographical location. However, this requires continuous updates and control of employment records and regulatory records. This was also one of the prerequisites for the Swedish parliament to "loosen up" the privacy laws that existed.

Olofsson says that the Swedish healthcare now has the opportunity and ability to communicate. Olofsson states, *"Today, we are working on creating the technical conditions for sharing information with each other. Having a secure system is a requirement for being able to share information with each other."*

> *"It does not matter how advanced the technology in use is, if the systems are not secure".*
>
> - Sören Olofsson, Executive director of Region Skåne

Ranklev also reasons that the security and safety of the IT systems is important since the healthcare contains of essential information. Ranklev claims, *"It would have been a great advantage if everyone could have the same system, but I also see a danger in terms of privacy of who should have access to the health record"*. The authors agree with Olofsson and Ranklev. The security aspect is important in the healthcare sector since information handled is sensitive and must not leak out. If health information about a public figure would leak out, this would have a very negative impact on Swedish healthcare. The security issue is a national matter as Olofsson states and must be coordinated and handled at a national level. The authors believe that this is a key factor for how fast the ICT adoption will take, since the security issue is crucial when developing new systems.

4.5.4 Resistance to change

Bengtsson and Kraft both believe that a problem today is to replace the old IT systems, which is 10-15 years old, to new systems. Bengtsson believes that the healthcare has poor ability to innovate and that the organization has difficulties to change. Jarlman also states, *"A barrier of IT adoption is that it could challenge the current structure"*, where he also believes that the healthcare has difficulties to change. One of the main barriers from the employees according to Andersson is the resistance to change. Andersson sees a problem with the time allocation towards education within the systems, and emphasizes that there is a lack of exchange in experiences within the current issues. Andersson stresses that it is vital to gain an acceptance and participation from the different departments. People need to take time to participate in workshops and training in order to find functions, hence make the systems more user-friendly. Hägglin elaborates that there are two sides of competences, *"My view is that you are proficient in the technology of your own department, but perhaps not as proficient in the*

overall system." The authors agree with the respondents and believe that Region Skåne has difficulties implementing change. One possible reason could be the complexity and size of the organization.

Ranklev stresses that one of the important drivers for further use of ICT systems is that Region Skåne shows the employees that the adoption of ICT will have positive effects and by successfully doing this you can get the staff on board. Today, you can see resistances to the systems since they are complex and staffs are forced to use the system.

4.5.5 Involving employees

According to Kraft the employees have difficulties in absorbing new standardized systems that come from external parties. Instead they want to be involved and have the possibility to decide and influence the direction of change. Hägglin agrees with Kraft and believes that decisions regarding which ICT system that should be implemented should not always come from external parties. Hägglin states, *"The initiative must come from the employees"* and there should be a more "pull-approach" in which employees contribute with their initiatives and ideas rather than a push approach where a central organization squeezing out an IT system. *"We need a better anchoring of the activities in the day-to-day business."*

> *"A key factor for a successful IT adoption is the operations involvement and interest".*
>
> - Rolf Bengtsson, IT strategist in Region Skåne

The employees themselves should drive the development and not the autonomous IT department that push the development. Ranklev believes that ICT in healthcare lags behind as a reason of its inefficient ability to construct good IT systems that are adoptable.

> *"The need is great, but doctors and nurses have to get their voices heard, and they must gather themselves so they can present what is most important."*
>
> - Eva Ranklev, Chief doctor at the University hospital in Lund

One of the factors that make it difficult to get the employees involved is the history of bad experience with previous systems. Implementations done in the past has created frustration

and a resistance to use and develop new ICT systems. This is something that Swanstein highlights with an example. In 1995, Region Skåne created a list of requirements that a system must meet before they are purchased. In 1996 a system was purchased even though some parts of the system had not been sufficiently developed and did not meet the requirements. These were process support and analytical assistance. Instead, these functions would come with the updated version 2.0. Thirteen years later, Region Skåne has not yet received an updated version of the system and this has resulted in great frustration amongst the employees. Swanstein states *"If it was a car being bought no one would have accepted a car that is not entirely finished"*.

Schwieler states that employees use different type of systems in a day-to-day basis, where they have to log in individually on all systems they use. The employees perceive this as a cumbersome. Schwieler state, *"We need systems that are not time demanding and that do not require much handling around the systems."* Many of the complicated systems in use today decrease the employees' willingness to use them. Kraft describes that doctors and nurses must sometimes make copies from one display and then enter it to a new system, since the systems cannot communicate. Swanstein states that certain groups of staff such as doctors can often be complicated to work with since they constantly have a lot of work and do not prioritize this type of developments. It is therefore important to involve all staff groups in the development and make them realize that the work they put down now will make it easier for everyone in the future. There has been a maturity in which more and more people are inclined to cooperate. Today, employees are also working on many different departments to a greater extent than before, which increase the awareness for the problems that exists today.

Once again, the opinions are divided between standardization and flexibility. A major challenge that is identified by the respondents is the importance of involving the employees in the development and implementation process of ICT. The authors believe that a successful ICT adoption requires involvement and interest among the employees, but Swanstein mentions that it is sometimes difficult to get the employees involved. The authors consider this to be a major issue for the future success of the ICT adoption.

4.5.6 Knowledge (lack of education)

Bengtsson believes that the doctors must obtain knowledge in how to use the different ICT systems. He states that some doctors have difficulties using the systems since they move between different hospitals and Bengtsson sees this as a reason for not having sufficient knowledge. Jarlman also suggests that the healthcare sector has too little knowledge about new ICT systems and the possibility to use them most efficient is not possible without more education. He talks about ”The office package’s curse”, where he believes that there exist many features in the ICT systems but the employees are not using more than they did on a typewriter. This is only one simple example, nonetheless Jarlman believes that this is the situation with many of the IT systems in healthcare. Jarlman further believes that to be able to use IT more efficient a more aggressive education strategy is necessary.

”Knowledge and skills in how to use the IT systems are missing today.”

- Olof Jarlman, Director of radiology department at Hässleholm hospital

Ranklev also identifies the lack of knowledge as a big problem, *“All employees are trained in how to use the system, but I see a need for further training within the system.”* Kraft agrees and believes that the education in the new systems is vital for the adoption of ICT to be successful. Kraft also claims that Region Skåne today is emphasizing the education and the implementation process to a higher degree. Nonetheless, Kraft claims that Region Skåne still makes mistakes sometimes, but works on improving the situation. Bengtsson suggests that the knowledge in the ICT systems will improve with a decreased number of systems in use. The absence of knowledge and skills in the ICT systems is apparent.

Hammar identifies another problem with knowledge. The difference in knowledge and skills in how to use IT and mobile phones is different between patients. The elderly patients are less accustomed to using IT and mobile phones. This requires that the Swedish healthcare provide an alternative way of delivering care to smaller groups that are not technical or do not have mobile phones or Internet access. Since the patients with the biggest need for care are elderly people, a barrier will be lack of technological knowledge. It is important to educate the elderly patients in how systems like “My healthcare contacts” works and how it can benefit them. The authors agree with the respondents and believe that increased education improves the effects of the ICT adoption. Increased education may also change the attitudes of those employees resisting change

4.6 Summary of key factors

- Digitalization of health records

  Healthcare today is about information management and with the implementation of digitalized health records the availability of information has increased drastically. Even though the expected effects has not been reached, digitalized health records has contributed to better decision support, faster access to relevant information and increased the safety for the patients. The authors have acknowledged that the biggest effect of the ICT adoption has been the digitalization health records.

- General effects

  There are some smart functions and services that have been developed, but these effects are limited to size or to a specific department like the web service *Klamydia på webben*. The authors believe that integration and coordination of systems needs to be completed before the patients and employees will explore the effects of ICT. Christenson state that the IT system of tomorrow supports the entire process, which the authors agree with. A problem that is identified though is whether it is possible to have one system that supports all needs.

- Standardization vs. Customization of systems

  The previous vision of Region Skåne *"let a thousand flowers bloom"* has resulted in the many ICT systems that are in use today. The main problem identified by the respondents is how to make the systems convertible, since various health record systems, various safety systems and different technical infrastructures are being used. There exists a great need for standardization in Region Skåne, while the employees prefer systems that are more customized towards their needs and work practices. The authors believe that it is crucial to have the information in the same format. A challenge is to find common ground between those who wants a standardized system and those who wants a customized system.

- Organizational structure

  The authors identify that the organizational structure has played a vital role in the ICT adoption and believes that a centralized IT department is crucial to solve the integration problem that exists in Region Skåne today. There are two clear sides among the respondents of how an optimal IT system should be organized, where one side wants a centralized and standardized system and one side wants a system that is more flexible and customized to the specific needs. The authors believe that communication plays a vital part and it is essential that the centralized IT department has a good channel of communication to the different departments and clinics.

- Security issue

  One of the major challenges is to develop a secure system that enables information sharing and this would require continuous updates and control of employment records and regulatory records. Healthcare now has the opportunity and ability to communicate and the different county councils are working on creating the technical conditions for sharing information with each other. However, it does not matter how advanced the technology in use is if the systems are not secure.

- Resistance to change

  Several respondents claim that healthcare organization has difficulties to change and a poor ability to innovate. The respondents believe that Region Skåne has difficulties implementing change and that one possible reason could be the complexity and size of the organization.

- Involving employees

  One of the main issues that were discussed was involvement of employees. According to some of the respondents it is difficult to involve the employees in ICT projects. Some respondents have a different perspective on the issue and believe that employees have not been offered the possibility to be involved in the issue. One major factor is how to improve the involvement of employees. The authors believe that a successful ICT adoption requires involvement and interest among the employees, and that this is a major issue for successful adoption of ICT.

- Knowledge (lack of education)

  Lack of education is one of the key issues that was brought up in the empirical data and that the authors would like to highlight. According to some of the respondents education in the usage of ICT system is not sufficient. More focus should be on education in order to improve the effects of ICT adoption. One future barrier is also how to educate many of the elderly patients that do not have enough technological knowledge to use the different services available to them. Increased education will improve the effects of the ICT adoption and may also change the attitudes of those employees resisting change.

5. Analysis and discussion

In chapter five the analysis and conclusion are presented in three parts. First, the theoretical framework is matched to the empirical findings. Thereafter, a proposal for new framework is clarified, which addresses the aim of the thesis. Finally, the contribution and limitation with the new framework are discussed together with a proposal for further research.

5.1 Applying the framework

5.1.1 Effects of ICT adoption

In this part the effects are discussed together with the important capabilities required to reach the potential effects of ICT adoption in healthcare. The analysis is based on the theoretical framework.

Besides the digitalization of health records, the effects from the ICT adoption have so far been marginal for Region Skåne. Region Skåne is at a starting point for the integration of systems. By looking at ICT as a resource, it is clear that the infrastructure is important. One main issue that Barney highlights within the strategic architecture is the infrastructure. A proper infrastructure improves Region Skåne's possibility to get the desirable effects out of the ICT systems. From the empirical findings several respondents conclude that the previous infrastructure ultimately lead to "*let a thousand flowers bloom"*, hence no structure in the way of coordinating systems and gathering vital information were in place. A proper infrastructure in the organization enables Region Skåne to handle such issues. Incorporating a strategic architecture provides a logic for any strategic move Region Skåne is planning to make. In order to cope with the future Region Skåne needs to identify the core competencies for their constituent technologies, since the ICT systems implemented so far have not resulted in achieving the expected effects.

Region Skåne also needs to identify which core competencies that are needed in order to get the most out of ICT. The resource allocation so far has not been as successful, and as many respondents confirm there are several systems in use today. One core competence is the knowledge of employees and in order to get the most out of the resource it is important that the users, hence the employees, have the proper capabilities in using the system. The empirical findings show that frustration exist among the employees over the system in use

today, as the ICT adoption sometimes has led to productivity decrease and systems being perceived as user-unfriendly with insufficient basis for decision-making.

Consistency of resource allocation and development of administrative infrastructure enhances the strategic architecture enabling Region Skåne to create a managerial culture, teamwork, a capacity to change, and a willingness to share resources in the future. As concluded the effects have not been great since, among other factors, the previous resource allocation of different systems, and an infrastructure that did not allow the employees to see and work with the potential benefit of systems acting together.

In order to cope with organizational change it is important that Region Skåne forces the organization to identify and commit to the technical and production linkages across each department in the organization. As identified in the empirical data, it is clear that each unit works highly individual. Prahalad and Hamel also mean that separation and autonomy between departments leads to ineffective distribution and cross-fertilization of resources. In order to get the expected effects out of the systems, Region Skåne needs to incorporate systems that can act together. However, there are some positive effects from the adoption of ICT in regards to processes, employees, and patients. In regards to the processes, most of the respondents confirm that mistakes due to ineffective handling of the old paper health records have been eliminated. The digitalization of health records has also led to increased information for decision-making, safer and more efficient care, hence improved the quality in healthcare.

For patients the effects of the ICT adoption has in some cases been very successful, such as in the case when young people can order an online test for sexually transmitted disease and in the case of “My healthcare contacts”, where the communication has improved. The communication with patients has high potential but the expected results have not been met, and one reason might be that the systems behind the solutions have not fully been coordinated and integrated within Region Skåne. The ICT adoption has not influenced the employees to any great extent besides the more available information from the digitalized health records.

Another perspective that needs to be taken into account when analyzing the effects of the adoption of ICT is how the value chain has been affected. Since ICT is seen as a support activity and technology development in Porter’s generic framework, it should be considered

acting as a complement in creating value in process. Although, it is the whole system of interrelated activities that affects the value creation, ICT is one of the contributors of value in healthcare if it is used properly and efficiently. The reason is that ICT improves the linkage between value activities within the value chain. These linkages are relationships between the way one activity is performed and the performance of another activity. Today, it is clear that Region Skåne's healthcare organization is not working as one system, but more in a way of separated departments. The empirical findings show that there is a clear lack of linkage between the activities in regards to the systems and their processes in the value chain. The systems cannot communicate and act together today. The information flow between the different departments needs to be coordinated in order to optimize the linkage, and here the information system technologies play an important role. This is also one explanation to why the adoption of ICT has not met the expected effects so far.

Region Skåne realized the importance of coordination when it in 2007 organized a centralized IT department in order to standardize the systems and improve the linkages between departments. Porter also confirms the importance of linkage between activities to be efficient in an organization. He elaborates that exploiting linkages requires optimization and coordination that cuts across conventional and organizational lines. The empirical findings show that Region Skåne now has realized the importance of linkages between departments. Simple solutions such as the system of vacant beds enable Region Skåne to allocate resources more efficiently and coordinate the activities. Examples such as cutting the average time for a referral to be received within Region Skåne from 30 days into a couple of hours could be the effects with an coordination and linkage between the departments within the organization. However, Region Skåne is in the beginning of the process and therefore not reached the expected results yet. Several of the respondents' agree with this, such as Christenson arguing that the IT system of the future needs to support the entire process and not only parts of the process.

5.1.2 Barriers of ICT adoption

Barriers arisen in the ICT adoption process are analyzed by the usage of the theoretical framework. The section begins with a short discussion of the change character of the ICT adoption. Further on, the critical factors from the theoretical framework are analyzed, divided into knowledge, norms & values, communication and involvement of employees. Finally, the new findings from the empirical data are discussed.

5.1.2.1 Type of change

According to Dawson change can be initiated by internal or external sources. As a provider of healthcare the need for improving quality, processes and efficiency is constant and technology can be used as an instrument for reaching these objectives. Most likely it was internal factors that triggered the ICT adoption in Region Skåne, even though the technological opportunities can be seen as an external trigger.

Since ICT adoption within healthcare has been expected, the scope of change can be classified as either "Tuning" or "Reorganization", depending on whether the changes have been incremental or radical. The authors believe the vision is to create radical change, but that Region Skåne has not succeeded in doing so. However, the reorganization of the IT decision-making to a centralized IT department can be seen as a transfer to a more radical change. Consequently, Region Skåne's healthcare will experience a radical change in the future. The ICT adoption has not had any major effects. The integration of the current systems enables the Region Skåne to make more radical changes.

5.1.2.2 Knowledge

Region Skåne has educated the employees in how to use the implemented systems. Nevertheless, some of the respondents claim that the education in the ICT systems has not been sufficient. Jarlman is one of these respondents and states that there is a lack of knowledge in how to use the systems in Region Skåne today. He believes that more education is necessary in order to improve the effects of the ICT adoption. Ranklev also identifies the lack of knowledge as a major issue and state that all employees are trained in how to use the system, but there exists a need for further training. When implementing new systems in an organization it is crucial to look at the cognitive factors according to theories in organizational learning. Cognitive factors are one of the key factors behind successful learning and consist of

character of knowledge needed in the organization and if employees manage the knowledge required to use the new systems. It is important that Region Skåne focus on giving the employees the education required to improve the usage of systems. More education may also change the attitudes of the employees resistant towards change, since the employees perceive many of the systems as complicated and user-unfriendly. With more education and better knowledge in how to use the ICT systems the negative attitude probably decreases in Region Skåne.

Hammar believes that the knowledge in the ICT systems among patients is a factor that is important to highlight. The new ICT solutions and services demand technological skills and knowledge that many elderly patients do not have. This factor is important to consider since elderly patients are those with greatest need for healthcare.

5.1.2.3 Norms & values

Institutional factors such as the norms & values, environment and strategy of the organization are critical factors behind successful learning. The empirical findings show that the ability to take in new technology in Region Skåne's healthcare is not high. Bengtsson has identified this problem and believes the healthcare has a poor ability to innovate and that the organization has difficulties to change. Jarlman agrees with Bengtsson and believes that any change initiative that can change the current structure will meet barriers, since the Swedish healthcare has difficulties to change. The resistance to change within the organization can also be higher compared to other organizations as a reason of the size of the organization, which makes it more difficult to involve employees in change.

Bengtsson believes that a key factor for a successful IT adoption is the operations involvement and interest, which he believes must be improved. Norms and values of organizations need to adapt to new ideas and changes. Employees must become part of the change process even though activating a critical mass of the employees is a great challenge. Without the norms & values of the organization adapting to new circumstances, successful learning is difficult to achieve. The empirical findings show that Region Skåne has not succeeded involving the employees in the change process, which is a prerequisite for adapting to new ideas and changes. Without the involvement and interest of the employees the change initiative is most likely short-lived.

Kotter believes that one of the most common errors organizations make when implementing change is to neglect to anchor changes in the corporate culture. He further describes that change sticks when it becomes "the way we do things around here," and until new behaviours are rooted in shared values and social norms, the new changes will not be long term, when pressure for change is removed. The norms and values of an organization play a vital role throughout the change process and are in many cases a change resisting force. Many of the respondents argue that the employees have not been involved enough in the change process and consequently it is hard to anchor changes in the corporate culture.

5.1.2.4 Communication

Organizational factors such as understanding communities of practice and managing the interface of the environment are critical. Communication is vital for the organizational context in many ways. The empirical data clearly shows that a major barrier is sharing information internally between the different care providers in Region Skåne. Bengtsson and Ranklev state that current systems cannot communicate and that a major issue is to integrate these systems to work as one system. Another problem that highlights the lack of communication is the implemented systems that do not support the processes, hence lack in understanding communities of practice. Whether the centralization of the IT department will solve many of the problems related to communication remains to be seen. However, with a centralized IT department the focus is on creating systems for the whole process and not only for the specific departments. Christenson and Kraft describe a situation where the doctors want the IT systems to be suited for their reality and their operations at the same time as the centralized IT department want to shape the IT systems from the perspective of the patient. Region Skåne must consider the two sides and a requirement for a successful implementation, is the communication between the different departments and the centralized IT department.

Kotter has a different perspective on communication and focuses on the role of the vision and how the vision is communicated. The respondents criticize the lack of vision when the ICT adoption began and state that many of the problems that exist today are a consequence of the vision "Let a thousand flowers bloom". The authors believe that more efforts should have been allocated towards formulating and implementing an overall vision from the beginning of the adoption process. Christenson states that a problem lays in the difficulties for all parts to put their business in a holistic way and that it will require a substantial work to achieve

common solutions. Today, Region Skåne has a new vision, which is in line with the Swedish eHealth strategy. Kotter states that a vision is vital for employees willing to be helpful and even make sacrifices. The employees need to believe in the potential benefits of change and perceive them as attractive. Swanstein and other respondents describe the difficulties in involving the employees in IT projects while other respondents state that employees should be more involved in IT decisions. These two problems can be perceived as symptoms to the lack of vision and lack in communication of the vision. To facilitate change, Region Skåne must become better at communicating the vision and involving the staff in the change process. If the employees doubt the vision or do not consider themselves to be a part of it, creating change is difficult.

Kotter also highlights another perspective of communication: the creation and communication of short-term wins. Ranklev believes that this is important for the adoption of further ICT systems. She believes that Region Skåne must show the employees positive effects from the adoption to improve the involvement of employees. However, this aspect has not been widely discussed in the empirical data. Nonetheless, the aspect can be important for Region Skåne in its adoption of ICT. According to Kotter true transformation takes time, and if there are no short-term goals to meet and celebrate the effort for renewal risks losing momentum. Without any short–term wins people give up or actively join those who are resistant towards change.

5.1.2.5 Involvement of employees

Involvement of employees is identified as a critical factor by most of the respondents and they argue that the employees using the systems have not been involved in the process of developing the systems. According to Zander an absence of employee involvement can be a source of resistance to change. Zander states that employees must be involved in change initiatives if an implementation is to succeed. Hägglin believes that decisions regarding what ICT system that should be implemented should perhaps not always come from external parties but from the employees themselves. Bengtsson agrees with Hägglin and believes that a key factor for a successful ICT adoption is the operations involvement and interest. Conversely, Swanstein believes that a centralized decision-making is of importance for the integration of the ICT systems, which today is a big issue. It is important to consider between involving employees and making decisions regards ICT centrally. Zander believes that resistance to change is a behaviour, which is intended to defend an individual from the effects of real or imagined change. If the employees are involved in the development or decision

process they feel involved in determining the direction of the change and as a part of the change.

However, Region Skåne must consider between the involvement of employees and the centralized decision-making. Kraft believes that the decentralized decision-making has led to the current situation with "Thousand flowers blooming", which is not optimal. At the same time Ranklev, Hägglin and Jarlman believe that involvement of employees is vital for the adoption of ICT. Consequently, it is of importance that Region Skåne manages and coordinates the adoption centrally at the same time as it involves the employees in the adoption process.

5.1.3 New factors

5.1.3.1 Security aspect

As concluded in the empirical findings the security aspect was found crucial. Olofsson and Ranklev believe the security aspect is of importance when adopting new ICT systems in healthcare. The different county councils are currently working on creating the technical conditions for sharing information, hence a secure system is vital for sharing information. The authors believe that the security issue is a key factor for how fast the ICT adoption will take, since the security issue is essential when developing new systems. If the county councils have troubles finding common solution, this could postpone the adoption process.

Ranklev has an interesting observation on the security issue and believes that it would be a great advantage if everyone had the same system, but sees a danger in terms of privacy and who should have access to the health record. If all the employees can access health information, the chance of information leaking out also increases. The authors believe that the security issue is of importance and it does not matter how efficient or user-friendly the systems are, if they are not secure.

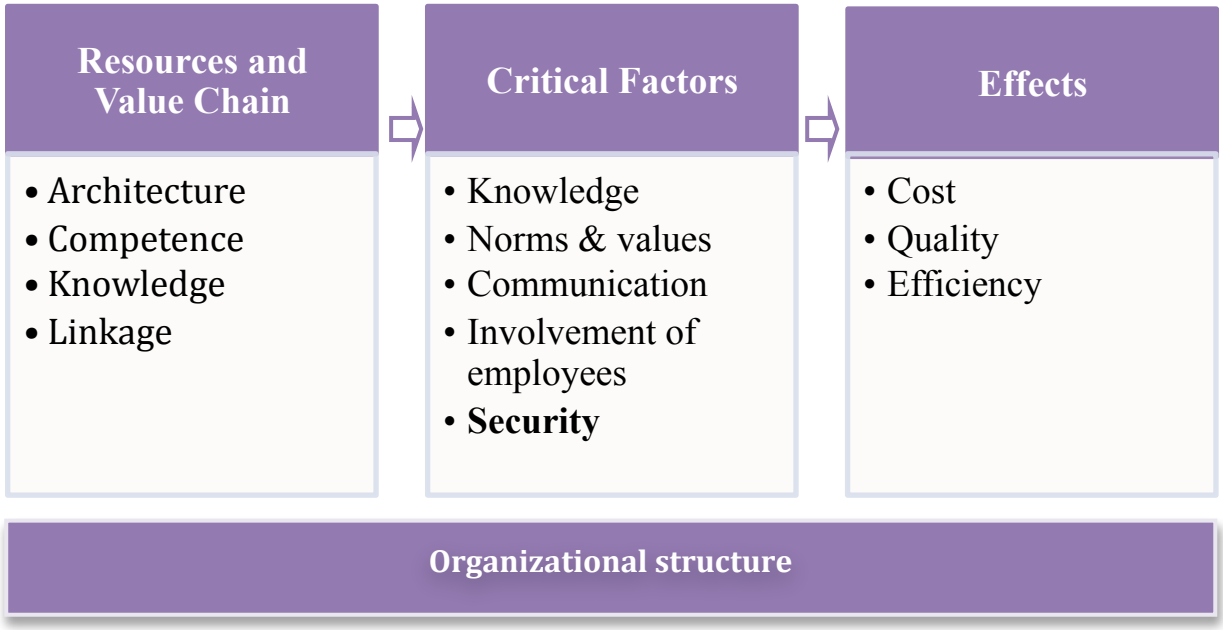
5.1.3.2 Organizational structure

The empirical findings conclude that organizational structure is of importance when analyzing the effects and barriers of the ICT adoption. In 2007 Region Skåne centralized the ICT decision-making for the whole organization, which has had a major effect on the organization and the adoption process of ICT. Before 2007 each department made their own decisions regarding ICT, which resulted in systems that are customized to the specific needs of the department. As a consequence there exist many different systems in use today that cannot communicate with each other. Integrating the ICT systems is the main objective of the IT department, but the respondents are divided between standardization and flexibility. With a centralized IT department Region Skåne modified the organization to better support the direction of change. This change in organizational structure is necessary for an improved communication and more efficient usage of ICT in Region Skåne. The authors believe the organizational structure plays a vital role throughout the whole process and it is therefore vital to include this perspective in the framework.

5.2 Proposal for new framework and conclusion

This part discusses the proposal for a new framework. Although, the possibility to reject factors in a framework is limited after a study of this kind, the study can contribute with interesting perspectives. In the empirical findings the security and organizational structure aspect were found relevant. The new theoretical framework is consequently complemented with the security and organizational structure aspect. The new framework addresses the aim of the thesis: to explain how the adoption of ICT influences the performance of the national health service and what barriers exist in the adoption of ICT from three perspectives; processes, patients and employees. The proposal for new theoretical framework is illustrated in figure 5.1.

Figure 5.1 Proposed framework for ICT adoption in national health service



The adoption of ICT has high potential resulting in decreased costs, increased quality and efficiency. Nevertheless, the adoption of ICT has not had any major effects on the national health service. The reason the effects have been marginal is, among other factors, that the adoption of ICT in healthcare has met many barriers. These barriers have hampered the possibility for a successful usage. The lack of linkage between the different departments is another explanation to why the effects have been marginal and that the ICT adoption has not met its high expectations. In the past each single department developed its own ICT systems. This development has decreased the benefits from the ICT adoption, since it has led to

linkages between the activities that are not optimal. However, today the case organization, Region Skåne, is working on improving the coordination and standardization of ICT systems, hence improving the linkages, with a centralized IT department.

Nonetheless, the adoption of ICT has influenced the healthcare in some aspects. The inefficient handling of the old paper health records has decreased with the introduction of digitalized health records. The digitalized health records have contributed to increased information available for decision-making, something that improves the quality and increase the efficiency in healthcare. The communication with patients has a lot of potential with ICT. Even if it has not met its all expected effects there are examples of improvement. The introduction of online test service for sexually transmitted disease among young people and the introduction of "My healthcare contacts" has improved the communication with patients and increased the efficiency. Although, patients and employees have not been affected to any great extent, ICT has great potential to improve the healthcare for patients and change the role of employees. However, one factor is that the ICT systems must be efficient in the usage inside the organization before it will influence the patients and employees further. The adoption of ICT is, in the long run, likely to meet the objectives to decrease costs and also to increase quality and efficiency in healthcare.

The key capabilities for the adoption of ICT as a resource are architecture, competence and knowledge. With the help of a strategic architecture the organization is able to allocate the resource of ICT more efficiently, exploit the knowledge of the employees and their core competences, in order to gain the expected effects. An example according to inefficient handling of resource is the resource allocation with different system. The different departments were not able to do this since there was an absence of strategic architecture in Region Skåne before 2007. Moreover, there was no proper infrastructure set up within the organization that exploited the core competences and knowledge of the employees.

To overcome the barriers in the adoption of ICT, the national health service needs to consider some critical factors. In the framework the critical factors are divided into knowledge, norms & values, communication, involvement of employees, and from the empirical findings the security aspect is also added. Further on, the organizational structure aspect is added to the framework as an aspect that influences all parts.

Knowledge among employees is important for a successful adoption of ICT. The absence of knowledge and skills in how to use the ICT systems is a barrier in the adoption. Consequently, education in how to use the ICT systems is essential for an efficient adoption and usage of ICT. The cognitive aspect in organizational learning means that the knowledge is of importance for the organization to absorb new systems. Also among the patients knowledge is vital since the new technology with ICT solutions usually demand new skills and knowledge.

Norms & values in the organization influence how new knowledge is taken in to an organization. Strong norms & values in an organization do sometimes hamper the possibility for successful change. The national health service has difficulties implementing changes as a reason of its traditional structure. The involvement of employees is essential for anchoring the change in the norms and values. Nonetheless, norms & values were not found as the most important aspect in the adoption of ICT in the empirical findings. However, even if the factor was not found as the most vital in the empirical data, it does not mean that it does not affect how ICT systems is adopted. According to theories in organizational learning norms & values are important for achieving successful learning.

Communication describes many dimensions and is essential for a successful adoption of ICT. Absence of communication can be a source of barrier in many aspects. The role of vision plays an important role and if a clear vision is not communicated there is a risk that the employees take different directions in the change process, which hamper a successful adoption. Creating and communicating short-term wins are also of importance even if this was not discussed widely in the interviews. Communication between departments as well as communication between the centralized IT department and the departments are found as a central aspect.

Involving employees in organizational change is essential. If employees are not involved in the change process, the risk for resistance among employees towards the change is high. Zander means that with strong top down imposition on individual of changes there is a risk that employees do not participate in the changes. The introduction of a centralized IT department in Region Skåne has created some aspects that are in line with this. Employees working with the IT systems on a daily basis have interest in the systems in use. It exists a conflict of interest, where one part of the organization wants the systems to be standardized

and one part of the organization want part that want the systems to be customized for its use. It is vital to balance between involving employees and make decisions centrally in the ICT adoption.

An observation is that norms & values, communication and involving employees are critical factors that influence each other in the national health service. The communication is important to get the employees involved in the adoption of ICT. Moreover, impacts the involvement of employees the norms & values in the organization, since it facilitates the anchoring of change within the organization.

The security in the ICT systems was an aspect the theory did not take into account as a barrier. However, in the empirical findings the security aspect was found relevant as a barrier in the adoption of ICT. In an industry like the healthcare, secure systems is of importance since the information available is very sensitive and must not leak out. It does not matter how advanced the technology in the healthcare is, if the systems are not secure. The security aspect might not be as important for the ICT adoption in other industries with less sensitive information, although in the healthcare sector it is highly vital.

The organizational structure is an aspect that neither was included in the theoretical framework from the beginning. However, in the empirical findings the organizational structure was found relevant as it influences how the ICT systems are adopted. The case organization, Region Skåne, has changed to a centralized IT department from previously having a decentralized decision-making, where decisions were made in each single department. The change in organizational structure impacts the whole process and the organizational structure was found as an important aspect as a complement to the other perspectives in the theoretical framework. Region Skåne has modified the organization to better support the direction of change. This change in organizational structure is necessary for an improved communication and more efficient usage of ICT in Region Skåne. The change in organizational structure impacts the whole process and the organizational structure was found as an important aspect as a complement to the other perspectives in the theoretical framework. The organization structure is found relevant throughout the whole change process since the organizational structure affect the strategic architecture, the linkage between the different activities and the outcome of change.

5.3 Analytical generalization

This part discusses the contribution and limitation with the new proposed framework compared to previous theories and studies. Finally, a proposal for further research is clarified.

5.3.1 Contribution and limitation

An advantage with the new framework is that it gives a good understanding of the adoption of ICT in the national health service. Moreover, the new framework is preferable since it takes in many different aspects for adoption of ICT. The framework includes the key capabilities for adoption of ICT, as a resource, what barriers to overcome for a successful adoption of ICT and how it influences the healthcare. Since change is a process the theoretical framework can be used to understand how the ICT implementation process has affected the organizational context and provide a deeper understanding for the processes that healthcare organizations go through as they change.

This study finds as Nikula (2001) that the effects have not been significant by the adoption of ICT in healthcare. An interesting observation is that the effects of the ICT adoption in healthcare eight years after Nikula's study still are not significant in the national health service. Nikula and Biselius (2007) find that the absence of vision is a contributing factor to the marginal effects. This is something that this study also finds, the communication of clear vision has to be better before the expected results can be met. Kurtinaityte (2007) indentifies the lack of integration of systems as a barrier for the positive effects, something that this study also sees. The lack of linkage hampers the possibility to reach the expected results. However, with the introduction of a centralized IT department the healthcare moves towards integration of the different departments' visions and systems.

Nikula further finds that most of the clinicians and few of the departmental managers felt that they had little or no participation in the process of deciding on and implementing the system, EPR. Biselius also identifies the importance of involving employees in the adoption process and to anchor the changes culture. Kurtinaityte finds the importance of involving employees as well and means that the value of ICT is lost without involvement of employees. This study also identifies the importance of involving employees in the adoption process to decrease the

resistance to change, even though it is not the most essential aspect. However, the involvement of employees must be considered to the more centralized decision-making.

In this study the knowledge among employees is found relevant for the adoption of ICT in healthcare. This is something that both Nikula and Biselius also find in their studies. Absence of knowledge in how to use the different ICT systems leads to resistance to change and hampers the possibility for successful adoption of ICT.

The organizational aspect that is found relevant in this study contributes to a new aspect compared to the earlier studies. This study examines the whole organization in comparison to Nikula, who mainly investigates two hospitals internally, which could be one reason for finding the aspect crucial. Another reason for finding the organizational structure relevant could be the relatively new change to a centralized IT department, which has influenced the ICT adoption process significant. Moreover, the broader perspective of respondents in this study can be a reason for identifying the organizational aspect as central.

The security in the systems is another aspect that this study finds highly relevant for adoption of ICT in the healthcare. A reason the earlier studies have not found the security aspect as relevant as this study could be the focus of their studies. Nikula (2001) examined the EPR-system and important to notice at this time is that the ICT revolution within healthcare was relative new. The security aspect has probably evolved with an increased usage of ICT. As mistakes have been conducted and knowledge learned, the security of ICT systems has become more essential in the adoption and integration of ICT systems.

A limitation with the framework is that it does not investigate the adoption on a specific level, instead it gives an holistic view of the adoption of ICT. An alternative to give a overall view of the ICT adoption in the healthcare could be to investigate a specific adoption or from a specific perspective, such as when Nikula examined the usage of EPR's. A further limitation is that the framework is used for organizations of non-profit character. In some other countries and also private hospitals, the effects in the framework should be changed to other variables such as price or profit. In Sweden most the national health service is of non-profit character. For this reason the focusing on competitive advantage has not been the objective for the framework, even though competition is increasing in the healthcare sector in Sweden.

5.3.2 Proposal for further research

The usage of ICT in national health service lags behind other service industries, such as the financial sector in terms of ICT usage. The effects of the ICT adoption in healthcare have not been significant yet. However, many of the respondents from this study identify a great potential for ICT usage in healthcare. An interesting study could be to investigate the ICT adoption in several different healthcare organizations instead of choosing one case organization as in this study. The new framework from this study can be tested in a quantitative study to compare the results and see if it brings new perspectives. Moreover, the situation can be compared with healthcare organizations in Sweden and also compared in a global perspective to identify differences.

The healthcare in Sweden is characterised by an increasing privatization of healthcare clinics. An interesting aspect would be to compare the ICT adoption between a public and private healthcare to see if the theoretical framework differs between the two types of organizations. The private healthcare has a more profit focus while the public has other targets that drive the organization. It would be interesting to see whether it influences the theoretical framework.

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Karin Christenson, 2009-12-04

Henrik Hammar, 2009-12-04

Åsa Hägglin, 2009-12-04

Olof Jarlman, 2009-12-08

Monica Kraft, 2009-12-08

Sören Olofsson, 2009-12-02

Eva Ranklev, 2009-12-02

Ulf Swanstein, 2009-12-10

Åsa Schwieler, 2009-12-01

Appendix A. Interview guideline

- What position do you have in Region Skåne?
- For how long have you been working in Region Skåne?
- How are you involved in ICT-implementations/changes/decisions?
- What effects have the ICT adoption created in the healthcare?
    - How has it influenced the processes in the healthcare?
    - What barriers?
    - How has it influenced the patients?
    - What barriers?
    - How has it influence the employees?
    - What barriers?
- How would you define the process and which phase is Region Skåne in now?
- How has the usage developed historically?
- How are new ICT systems introduced?
- What are the drivers for ICT spending?
- What barriers/challenges have you seen with an increased ICT usage?
- What are the key factors for a successful implementation?

Appendix B. Respondents

Lena G Andersson works within the IT strategic department at Lund University hospital. The group works mainly to support the business process regards to IT. The needs and requirements of the business is captured by the IT Strategic department and transmitted to a central coordinated client function. Together, they prepare a plan of needs, a plan that is later adopted by the Board of Management and culminates in a number of projects.

Rolf Bengtsson works as an IT strategist in Region Skåne. Rolf has responsibility for an IT strategy for Region Skåne and his department cooperate a lot with the national IT-strategy for eHealth. Rolf has worked within Region Skåne since 1993.

Karin Christenson is Director of Health & Medical Care at Region Skåne**.** Karin has a long career in the healthcare sector and is responsible for the quality of the healthcare in Region Skåne.

Henrik Hammar is the Chairman of the Health care board that sets standards and guidelines to the public and private health care providers in Region Skåne. Henrik is also chairman for the Health Advisory Board. Henrik has collectively worked in healthcare for 20 years. Henrik Hammar was voted the second most influential person in Swedish health care 2008 by "Dagens medicin".

Åsa Hägglin works within the Strategic stab at the University hospital in Lund. The Strategic stab task is to support the hospital manager and line managers in the development of the hospital in the longer term, between five and ten years. The work includes to constantly study activities in the outside world, both within and outside healthcare, in order to propose methods and, if necessary, new business philosophy to continuously improve the University hospital in Lund.

Olof Jarlman is director of radiology department at Hässleholm hospital and also supervisor of Lund University Program in Medical Informatics. Moreover, Olof is involved in a couple of companies researching around telemedicine and healthcare at Ideon. Olof is also doctor in radiology.

Monika Kraft works as director IT and Communication in Region Skåne. Monika has worked in Region Skåne for one year now. Earlier she has worked a position as a director of communication in Stockholm's county council and was among other things working with the national IT strategy.

Sören Olofsson is the executive director of Region Skåne and have a long experience in the healthcare sector and the pharmaceutical industry. Sören have also worked as the executive director of Stockholm's county council and been a board member and acting president for Apoteket. Sören Olofsson also initiated the project that would later become Sweden's IT strategy.

Eva Ranklev is the chief doctor at the University hospital in Lund. Eva has worked in the hospital since the late 1970's and has been the chief doctor over the last four years. This means that she is in charge of patient safety, and is overall responsible for the coordination of patient safety, including responsibility for notifications within the hospital.

Ulf Swanstein has a background as a paediatrician and has been the director of the Program Office since the fall of 2007. The Program Office works on coordinating "one patient, one health record and a patient-support operations" which should be realized 2012.

Åsa Schwieler is Project Manager within Socialstyrelsen, where she has worked on several projects in the field of ICT usage in the Swedish healthcare. Åsa has also worked on ICT projects within Region Skåne. During the past three years she has been project manager for *Nationell Informations Struktur* (National Information Structure).