CHALMERS
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Digital support systems
A case study of Swedish county councils

Master's Thesis in the Master's Programme International Project Management and Project Management

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ABSTRACT

Digitalisation is one of society's most powerful agency of change, and has already changed or will change every industry. Therefore, it is essential to create learning organisations that can adapt to the rapid development of digitalisation. Old business models will be erased by new digital solutions and may be an issue for organisations within the public sector. This is why E-government is in an expansive stage in Sweden, and also the reason why this report has digital support systems as topic. Digital support systems have the potential to increase efficiency and enhance openness and transparency. It could be a tool for change and control, and enhance coordination and collaboration between similar organisations in the public sector. But there is still uncertainty as to how to handle such systems and make them as useful and efficient as possible. The purpose of the research is to understand what role digital support systems have in Swedish county councils. The aim is to analyse the opportunities and challenges related to digital support systems, but also to analyse an already developed web-based management system called Program for technical standard (PTS). It is a qualitative research approach, and a case study has been presented on digital support systems in Swedish county councils, and eight semi-structured interviews have been performed. The empirical findings show that there is a lack of a structural process when working with digital support systems, which could be related to lack of experience and competence. This has led to short-term solutions and new digital systems are founded all the time. PTS has the potential to become a helping tool for this, but it seems be in an early phase and some have recently joined PTS and others have not had the time to implement it. Conclusions can be made that digital systems have a possibility to invent structured internal processes and make information available in a more efficient way within county councils. This will enhance collaboration with others and standard rooms can be used and shared in a common database. It is also vital to note that digital support systems must be easy to understand and easy to use, otherwise they will be ignored.

Key words: Digitalisation, E-government, Digital collaboration, Digital support systems, Program for Technical Standards

Contents

Preface

This study has been written as a final part of the dual award M.Sc. program International Project Management at Chalmers University of Technology, Sweden and Northumbria University, UK. The author, Michael Sundberg has a B.Sc. in Mechanical Engineering and the study was conducted in Gothenburg between January and September 2017. Since the society is becoming more digitalised, the motivation of this study was to understand what role digital support systems has in Swedish county councils.

I would especially like to thank my supervisor Abderisak Adam and examiner Göran Lindahl for their excellence guidance and support during this thesis. Also, I would like to share my appreciation for those who participated in the interviews and took their time to share experience and knowledge. At last, I would like to thank my opponent, Niklas Streijffert for the companionship, insights and valuable discussions during the thesis.

Gothenburg, September 2017

Michael Sundberg

List of Figures and Tables

1 Introduction

The aim of this chapter is to explain the purpose of the research. The background defines the problem, research aim and research questions are presented as well as the scope and limitations and structure of the thesis.

1.1 Background

There is an intensive development around the world when it comes to digital services in public administrations and regularly global measurements are carried out by both EU and UN in order to follow each countries development (E-delegationen, 2015). The E-government in Sweden is currently in an expansive stage. There are a lot of developments and change processes that are initiated at individual counties, regions and municipalities at the local level. The process is often based on an overall E-government with a goal to make it simpler, more efficient and more transparent. Beside local efforts, there are comprehensive public efforts, such as the collaboration and coordination between different authorities. Sveriges Kommuner och Landsting (SKL), is active within the local sector, but also Sambruk and other regional municipality organisations. Besides that, there are initiatives at a national level with a goal to improve the E-government (Goldkuhl, 2014).

The public sector in Sweden is well-functioning and most of the people have great confidence for how it works. The Swedish agencies, county councils and municipalities are working well and with respect to digitalisation, Sweden was ahead with secure IT-systems and unique databases. Swedish agencies have previously had many impressive e-services, but the issue is that the country have significantly been falling behind the last ten years. An overall responsibility in the government is needed in order to drive the digital revolution, and thus the Swedish government has decided to investigate the possibilities to a collaboration regarding the issues of digitalisation, which already exists in Norway, Denmark, and Finland for example (Shekarabi, 2016). Before, Sweden was a country that many others compared themselves to regarding the digitalisation in the public sector, that has now changed. Every year, Sweden is falling in international surveys. The conditions for digitalisation in Sweden are great, but, digital services in authorities, municipalities, and county councils lack of improvements compared to other sectors. And the goal to be the worlds' most digitalised country become more and more difficult when other countries have more focus on digitalisation (Zetterberg, 2016).

By 2025, digitalisation is the society's most powerful changing factor, more and more smartphones, computers, apps, internet purchases and services are a huge part of every person's life and the realisation that we cannot live without them is a fact. Digitalisation could be compared to the industrial revolution, and will change every industry (Gillberg, 2015). While industry after industry are changing through digitalisation, new digital networks will erase old business models and the foundations in different sectors will change, and the environment sector is in an exponential stage where the digital development is ahead of us, the society must build learning organisations in order to manage the rapid development of digitalisation (Hamon, 2016). Research shows that digitalisation place large demands on the companies and that they should adapt their business models after it. Today, industries and companies are locked to their current appearance and niches, which lead to missing out of new business ideas that comes with digitalisation and according to Gillberg (2015) disruptive is a concept to remember.

Disruptive innovations or disruptive technology are new business models and technology that will fundamentally change markets, and the question is how those disruptive innovations will change the real estate industry (Gillberg, 2015).

The Swedish government has given an assignment to Lantmäteriet to work for a more digitalised civil construction process, which will help the municipalities to work more efficient, easily and increase the rate of constructions. This includes standardisation, regulatory changes, and Nordic cooperation that will help to make the process more effective. One of the most important part is digitalisation and how to implement it to get standardised models, a working information flow, new business models and how to work in lager processes and not only locally (Bengtsson, 2016). The healthcare building sector in Sweden is facing major investments. Meanwhile, decentralization within health care has led to a disunited national coordinated knowledge formation with respect to the construction of healthcare facilities. Earlier, SPRI (Healthcare Planning and Rationalization Institute) was responsible for the knowledge-building by providing guidelines and processes. As a contemporary alternative to SPRI, 16 Swedish county councils and regions are cooperating in a network that is a web-based management system for healthcare's provision of premises – PTS (Program for Technical Standards). The aim is to effectively ensure the quality and continuously improve the delivery of appropriate and sustainable facilities. The PTS system lacks a comprehensive process support, a planning model, which describes how the planning of health care facilities can be implemented in an effective and sustainable way to meet today's challenges and a rapidly changing health care sector (Hinnerson, 2015).

1.2 Research aim and research questions

The aim of the research is to study the role digital support systems in Swedish county councils. The research question of the study is as follows;
What is the role of digital support systems in Swedish county councils?

I. What are the challenges and opportunities with digital support systems?
II. What is used today and what is missing?
III. To what extent is PTS used?
IV. What are the challenges and opportunities with PTS?

1.3 Research scope and limitations

The scope of this research is to get an understanding of how digital support systems are used and handled in Swedish county councils and PTS will be analysed. The study was conducted over a specific period of time and the interviewed organisations was located in Sweden in and the interviews were held in Swedish. A limitation is that only eight persons was interviewed in the study which gives a limited result regarding the ability to generalise the study in other organisations, but, the result had a similar pattern from every interview and similar problems was recurring. Another limitation may be that PTS had not been fully implemented in all county councils, which made it difficult to receive detailed answers from every participant. Also, not all of the Swedish county councils were interviewed and can be recognised as a limitation.

1.4 Structure of the thesis

In the second chapter, theoretical frame of reference is presented including what meaning IT has in public organisations, different values in the public administration and E-government, the potential of E-government and what changes come with it, lastly digital collaboration and what challenges come with it.

In chapter three the methodology is presented, including research strategy and research design, data collection method, analysing, research reliability and validity, and research ethics.

In chapter four empirical findings are presented including findings from the interviews.

In chapter five the empirical findings are discussed in relation to the theoretical frame of reference.

In chapter six the conclusions are presented but also suggestions for further research are presented.

In chapter seven recommendations are presented.

2 Theoretical Frame of Reference

The aim of this chapter is to describe the concept of digitalisation and to analyse what impact it may have on the public sector when trying to implement digital support systems. First, the chapter will explain the meaning of IT in public organisations, then what values digitalisation comes with, followed by E-government and Digital collaboration.

2.1 The meaning of IT in public organisations

We need to understand what impact Information Technology (IT) will have on organisations in order to understand how public administrators will change toward digitalisation. Organisational and technical systems are independent and IT develop through the social context. IT will help to shape practices, procedures, and assumptions in an organisation and therefore it is reasonable to investigate what role technology has in the public organisation's management processes. Previous research argues that the use of digital systems could be important for quality and business organisation, but also have a potential to contribute to change and development processes in an organisation. Technology could be an effective tool for change and control, but it could also have impact on the organisation in unexpected ways (Andréasson, 2015). According to Orlikowski and Scott (2008) IT offer five benefits; codifying the knowledge base, linking and enabling employees, increasing boundary spanning, enhancing coordination and collaboration, and improving information processing. Those benefits moderate relationships between characteristics such as size, structure, culture, inter-organisational relations and learning, and organisational outcome of innovation and efficiency. Andréasson (2015) claims that the public administration consists of several actors instead of being uniform. Also, that other actors not in the public sector are trying to influence society's development and lastly that administration occurs in a network of policy where resources, power, and strategy are important factors. Therefore, an important key value is **collaboration** when it comes to governance in the public sector. IT has created opportunities to organise through processes and has the possibility to increase the capacity of communication, computing power, and integration capabilities (Orlikowski & Scott, 2008).

2.2 Values

The reforms of digitalisation have impact on the public sector in different ways, digital solutions enable activities that would be difficult to apply without them, and digital solutions have the possibility to increase desired values. It is important to remember that technology is never value neutral, technology is socially created and the values related to digital systems will affect the values within the organisation. Digital solutions can carry different values, but also change the balance between values (Andréasson, 2015). According to Bannister and Connolly (2014), there are many adjectives in the context of transforming government; transparent, make it more open, participative, responsive, and agile etc. Most of them, if not all, are public values or underlying public values. Andréasson (2015) claims that nearly every implementation of digital systems has a bearing on public values in the public sector.

"What is clear is that ICT alters the landscape of public service values and ICT is not value neutral" (Bannister & Connolly, 2014, p. 125).

2.2.1 The public administration values and E-government

Rose and Persson (2012) assume that values in E-government depend on the values of the public administration. There are various communication and information technologies that support functions and goals in government. This report refers it to "digital support systems". Some examples of digital support systems are:

- Database technologies, e.g. data collection or file sharing.
- Tracing and tracking technologies, i.e. monitoring processes and workflow management.
- Desktop technologies, i.e. personal digital assistants, text processors, e-mail, and other types of internet facilities.
- Decision support technologies, e.g. spread sheets and other types of computer programs and expert systems.
- Network technologies, e.g. homepages, websites, e-mail, and call-centres (Rose & Persson, 2012).

According to Rose and Persson (2012), Weber define the files in bureaucratic foundation of administration in a modern public administration as mainly digital, stored in databases, case handling systems, document management systems, email archives, and customer management systems. Rose and Persson (2012) explains that the responsibility for integrity, security and durability of the files, i.e. a basis for most forms of accountability, is reassigned to the IT-manager. IT is becoming a principle to ensure transparency in government, meaning that any information which can be digitalised can be available to the citizens. The way politicians and senior administrators often see Information and communication technology (ICT) is that it increase the efficiency and productivity, and reduce costs, but there is not that much evidence that implementation of ICT will make this happen automatically (Rose & Persson, 2012). Moon (2002) concludes in a study that many municipal governments have adopted E-government, although it is at an early stage, and has not achieved a lot of expected outcomes such as downsizing and cost savings, which rhetoric of E-government assured. According to Orlikowski and Scott (2008), technologies is understudied in organisational research, and that the absence of technological issues is a serious concern. Although, ICTs have the potential with its collaboration systems and net-based social networking to support inclusion, deliberation, local democracy and participation. Therefore, IT is ubiquitous in government, and have the potential to assist most of the purposes and support most of the values in public administration (Rose & Persson, 2012). It is a fast-moving field with many changes over time, meaning that approaches and methods need to be developed over time, and that concepts should be held lightly and updated frequently (Orlikowski & Scott, 2008).

2.2.2 Three value drivers for E-government

Rose and Persson (2012) summarise the value landscape with three value drivers, those drivers are complemented by foundational values, and the aim of the model is to aid the conceptualisation of purpose, but also work as a motivation in decision-making processes when it comes to E-government initiatives.

i. Administrative Efficiency

Administrative efficiency is considered as the three E-values: Effectiveness, Efficiency, and Economy. They represent the core value, i.e. keep it lean and purposeful. Another

way to look at it is as cost savings, cost benefit, return on investment, avoided future costs, risk reduction, controlling fraud and waste, better staff efficiency, and increased capacity (Rose & Persson, 2012). Moon (2002) suggests that there are shared barriers, such as personnel, technical and financial capacities, also legal issues like privacy, in the process municipal E-government.

ii. Service Improvement

Service improvements have possibilities to improve several aspects in the public administration, e.g. avoiding travel, better access to information, shorter response times, online applications, online advice, cost saving for citizens, and automated benefits etc. Although, it is important not to hide the government's human side behind a digital wall (Rose & Persson, 2012).

iii. Citizen Engagement

There is a democratic value consisting transparency, access to information, and flexibility for citizens. Also, there is a focus on deliberation, dialogue, openness, democracy, consensus-building, shared leadership, collaboration, and participatory policymaking. But online services will not be efficient if citizens are not using them, therefore the services and systems need to be designed in accordance with usefulness and ease of use (Rose & Persson, 2012).

iv. Foundational values

Foundational values reflect over the rule of law, legitimacy, equality, impartiality, legality, objectivity, accountability, and transparency. But also, internal values like: staff morale, internal communications, staff attraction, motivated staff, retention of staff, empowering staff, and better staff creativity. And external values like: good public image, being well-informed of the private sector and other administrations, and matching external benchmarks. The daily work of an IT-manager within the government include infrastructural integrity for networks and databases. Security and privacy, open access of information on web-sites, legislation and regulations, reliable services, produce tools and services for other government employees, and make access to decision-making information for managers are variables that is important to take into consideration as an IT-manager. The foundational values work as a platform for E-government and the digital age (Rose & Persson, 2012). A study from Moon (2002) indicates that the size of the city and manager-council government are related to adoption of municipal web-sites, and the permanency of the web-site.

Figure 1 illustrate and summarise the value divers for E-government, where the foundational values works as a backbone of E-government (Rose & Persson, 2012).

Figure 1 Value drivers for E-government (Rose & Persson, 2012)

2.2.3 The values of digitalisation

Andréasson (2015) highlighted values from a county council's policy document related to desired focus area when it comes to digital support systems. The ambition was to strengthen those values with digitalisation, the values are shown in Figure 2.

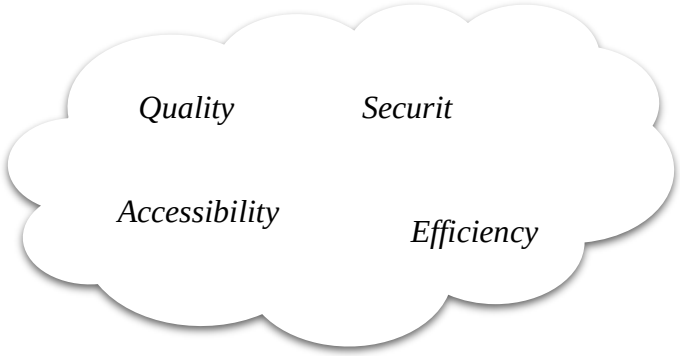

Figure 2 Expected values that will be strengthened with digitalisation. Adapted from (Andréasson, 2015)

Accessibility:
Within the county councils budget documents, accessibility is highlighted as an important value, meaning that the information in healthcare should be more accessible. The digitisation will make the information of patients cross-bordered, that will make the healthcare process more efficient. This will in turn increase the availability for the patients (Andréasson, 2015). Accessibility values related to responsibility and economy may be technology enabler, information and reporting systems, and transactions, those values have facilitated to an more effective and efficient public service (Bannister & Connolly, 2014).

Security:
Security is another value that is highlighted as a reason when implementing digital patient journals, meaning that the healthcare will be more secure if data of each patient is available all the time (Andréasson, 2015). The organisational challenges are greater in this stage according to Layne and Lee (2001) and existing databases need to be reprogrammed to handle changes involving internal committees in order to assess demands from the users and the interfaces in currently used systems. There are issues related to security and confidentiality that must be addressed by the organisation, and existing legislation needs to be studied to determine how private or public the database should be for the agency.

Efficiency:
Efficiency is another highlighted value towards digitalisation and digital support systems. The organisation will be more efficient if the availability of information improves, but also simplifies. In relation to new digital support systems, the workflow in organisations will change in order to reach the full potential of the implementations (Andréasson, 2015). Being efficient is considered important for public servants to be, but Bannister and Connolly (2014) claims that it is a question of morality and is a subtle, but important when considering the impact of values related to ICT. Instead of using the definition efficiency, Bannister and Connolly (2014) is referring it to 'doing things in an efficient manner'.

Quality:

Digitalisation could be seen as a tool to increase the organisations quality, and a result of new digital support systems is that accessibility, security, and efficiency improves (Andréasson, 2015). A question to be considered is how the quality and responsiveness of the online system will be in comparison to the offline system (Layne & Lee, 2001).

2.3 E-government

For more than 50 years, governments have been using ICT, and over the past ten years the investment in technologies has increased. There are some stated key reasons for the investments and some of them are that technology could increase the efficiency in government operations, IT enhance openness and transparency, the strengthening of democracy, and it could provide better and useful services for the businesses and citizens (Flak et al., 2009). According to Goldkuhl (2014), the Swedish government model with its relatively independent agencies and self-governing counties are essential in order to develop the Swedish E-government. However, it faces significant challenges in achieving the aim to improve and make the governance more effective when it comes to digital operations. Meaning, digitalisation contains both possibilities and demands related to the coordination and co-usage of possible solutions in the public sector. E-government is a central topic when it comes to improvements of the public administration, and underlying values related to E-government practitioners are considered important motivation for strategy and the implementation of E-government projects (Rose & Persson, 2012). According to Layne and Lee (2001), the E-government initiatives are considered unmanageable and chaotic. There are numerous initiatives from the academy, different levels of government and practitioners' conferences, and has shown different challenges for public administrations when implementing E-government.

What happens when new digital solutions are introduced and used in public sectors? That is what E-government is about. There could be different kind of digital solutions, internal solutions could be used to make the organisation more effective, or there could be external services intended for the citizens. E-government is a multidisciplinary research field and a reform in public administration. Digital solutions are at a stage where it has the potential to contribute to radical management changes (Andréasson, 2015).

"The concept of eGovernment has no unambiguous definition, but in broad terms described as processes in order to develop management services through different Electronic channels, increase internal efficiency and citizens' political Influence" (Giritli Nygren, 2009, p. 5).

2.3.1 The potential of E-government

Pollitt (2011) claims that technological changes increase the volume and speed of computations and communications, and minimised time and space, which made them less important. But, in the same time, technological changes have opened for possibilities regarding mass access to public decision making. Research has shown what potential IT could have in order to improve and change public administration, digital solutions have the potential to improve services, efficiency, decentralisation, interactivity, accountability and transparency. E-government has the potential to build a more dynamic and customer focused organisation instead of a hierarchal traditional bureaucracy. The new dynamic bureaucracy has the potential to coordinate different departments of the administration and gather public service to a certain point where the

information is available for the citizens. Digital solutions have the possibility to create structured internal processes and make information available in a more efficient way (Andréasson, 2015).

2.3.2 Changes that comes with E-government

One significant change that comes with E-government is that digitalisation will change the communication between the administration and other actors. Face-to-face communication is decreasing, information and communication through websites and e-services are increasing, it is a more cost-efficient administration. New digital solutions will lead to internal change within public organisations, it could have a distinct impact on day-to-day operations. Working tasks could change through the structural and governing role of digital systems, the rules of handling tasks could change to make them more suitable for new digital support systems. It could also provide new tools that will help controlling the organisation (Andréasson, 2015).

"As more services that were hitherto provided by people are provided by machines, the flexibilities inherent in human systems are often lost in the more rigid world of machine rules" (Bannister & Connolly, 2014, p. 125).

According to Andréasson (2015) the development towards E-government is linked to the relationship between public and private organisations. It is common that public organisations need to cooperate with private companies since the technology often is delivered or administrated by the private sector, and therefore, digitalisation can enhance marketization in the public sector. Studies show that common issues are lack of internal expertise within the digital area in public organisations when implementing IT-projects. One of the reasons is the attraction to the private sector and with higher salary, they have the possibility employ the most qualified. But, Navarra and Cornford (2012) claims that the nature of government is not aligned with activities and goals of private sector organisations, and point out that organisations in the private sector are not democracies. The context plans in private sector are mostly recommended and made from the top level, and implemented down the hierarchy through consensus building, practices of command, change management, and awareness training. Therefore, it is essential to be careful when considering the extent of which practices, models and assumptions of governance can sustain when creating digital support systems. Navarra and Cornford (2012) continues to explain that E-government should not be used to be more "business" like, but it should be considered as a vehicle for transformations and as a strengthening of democratic politics.

One thing to remember is that those digital changes do not necessarily need to change the public organisations in a revolutionary way, but digital solutions could be used to strengthen existing structures (Andréasson, 2015).

2.4 Digital collaboration

Interaction is a concept that have become more important the past decade and is often initiated to increase profit for all parties. Interaction is characterised by human and electronic communication, collaboration, common processes, exchange of experience and knowledge, common perception, and a common goal (Skyttermoen & Vaagaasar, 2015). FoU-project (R&D project) focus on IT-resource management, which can in some way be a shared concern for several public administrations. It is called shared public digital resources, and the idea is to see the public sector as a coherent actor where

different authorities, regions/counties and municipalities need to work together to regulate and support the citizens. Shared public digital resources, are resources that involve more than one administration in any matter, and it is about transcending the boundaries in the regional, governmental and municipal sectors in many cases. (Goldkuhl, 2014). Digital collaboration means that local authorities, agencies and private stakeholders are exchanging information in a digital way, and by working together, handle the digital information in a legally and effective manner. There is a great need for sharing information among governmental departments and this is referred to as digital interaction which is a support for organisations that need guidance to develop common digital solutions in the public sector (E-delegationen, 2015).

Goldkuhl (2014) identified four different types of situation interactions related to shared digital resources:

i. Exchange of information between administrations
ii. Common website
iii. Common IT-components in web sites
iv. Similar IT-systems (back office)

"The concept of digital collaboration means that players who agreed to cooperate streamline their operations and create value by exchanging information and interact with digital services" (E-delegationen, 2015, p. 3).

Availability, dissemination of information and knowledge to relevant actors is essential when it comes to interaction and digitised communication has become an important element for this. There are arguments that digital communication models have the possibility to improve the interaction when implementing projects, and can increase the quality and productivity (Skyttermoen & Vaagaasar, 2015). According to E-delegationen (2015), the basic requirements for digital collaboration is to have a shared understanding when it comes to needs and objectives, but also to understand relevant legal conditions and requirements related to security of the information. In municipalities and counties/regions, there are IT-systems with similar functions within the administrations' internal processes, i.e. back-office. From the bottom, they have a comparable organisation with same tasks and regulations. Thus, the same type of organisation creates an opportunity to use similar or identical IT-systems. Within the counties/regions, there has been common initiatives for a long time compared to the municipalities. Also, in government, there are common initiatives related to business organisations that motivates a similar steering of digital resources in the back-office. Figure 3 shows an example of similar IT-systems in two different administrations (Goldkuhl, 2014).

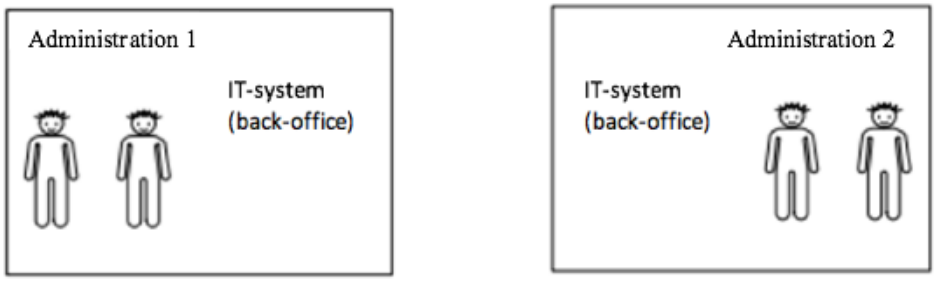

Figure 3 Same or similar IT-system (back-office). Adapted from (Andréasson, 2015)

In recent years, the development of digital collaboration has shown that it demands several key competencies when establishing and managing digital systems. Technical expertise is not enough. It requires knowledge in how to reach a common understanding of the digital concept, competencies to manage a complex collaboration and a deep understanding of the legal conditions and information security are needed (E-delegationen, 2015).

Feedback in term of surveys, marketing activity, and analysis of sale figures are important inputs in the private sector, but means possibly more in the context of government. Which in turn implies a shift from the conventional program of E-government, meaning not to focus on each application in isolation and is leading to the term "sibling systems". A sibling system describes as self-organised distributed communities, and is built around a system that provide a digital spine, which could be created as individual applications that serve interests in relation to common protocols and standards. E-government is more understandable and deployable within a "grid" architecture, which can recognise the need for sibling systems aligned to the political ambitions and social welfare, but also aligned with the administrative and technical potential. The model requires a high level of distributed coordination, and to create a legitimacy and support of democratic rules (Navarra & Cornford, 2012). Figure 4, shows two different administrations with the same or similar IT-system, and a shared website where information can be exchanged with each other and external users.

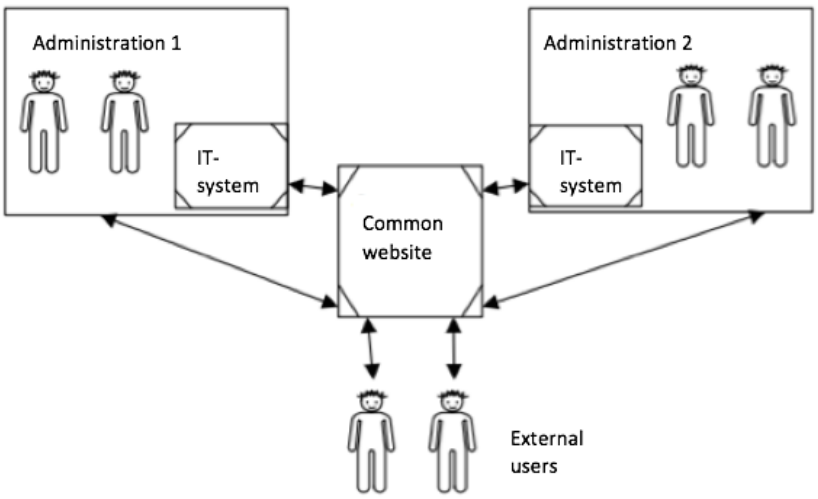

Figure 4 Common and embedded IT components in different IT-systems. Adapted from (Andréasson, 2015)

2.4.1 Challenges with digital collaboration

There are challenges when two or more actors want to collaborate with digital solutions, the greatest challenges are not related to technical issues. Instead, the main challenge is the ability to look outside the organisation and to maintain the customer focus over time. Collaboration outside the individual organisation could lead to changes to the whole or large parts of the organisation, but it is important to see possibilities instead of difficulties (E-delegationen, 2015). When developing a network, it often involves large temporal challenges, which could require long-term development budgets in the coordination of administrations. Economic issues are often difficult to handle in the administrative cooperation, and it may be hard to ensure the cost of investments. Also, there could arise an uncertainty among the public administrations when managing common resources, and sometimes a lack of understanding the concept of shared digital

development. The development within networks are also challenging and difficult in relation to hierarchical structures where upper management usually handle situation of conflicts. Therefore, it is important for the actors to find constructive ways of cooperation, decision making and solution of conflicts within the development of networks. Different views of administrations and lack of interest could become a risk to the development process, and that there could be an unfamiliarity and lack of competence when it comes to operate in network-based organisations among several administrations, which sometimes lead to lack of commitment. A common website involves collaboration of information and services. But there are challenges when building a common website, e.g. that the governments have different IT-systems which can make it hard to implement and manage them all at the same place. Other difficulties may be the target image regarding the common website, and it could be hard for the administrations to act in the same phase regarding development efforts (Goldkuhl, 2014). One difficulty concerning technology is that it will cause organisational changes, e.g. diffusion, development, adaption, adoption and improvements. One other difficulty is related to the technology-human relationship, which involves interrelated distinct processes or entities (Orlikowski & Scott, 2008). Actors are used to focus on their own organisation instead of analysing the information structures and processes from a wider perspective, which can make the solution limited and will not solve the customers' total needs. It is difficult to manage the legal situation, which can lead to a different view on requirements when it comes to exchanging information. There is a challenge to standardise and apply standards in a common way for the actors, and there is a risk that the new way of working is described differently and that new solutions are produced for each need that arises, where standardised solutions would be possible to reuse. Another challenge is that the definition of concepts and designations are usually not uniform and public, which makes it difficult to reuse information. Actors do not have a unified view of what internal concepts stand for and in what way the information should be structured. This could lead to miscommunication and difficulties to collaborate in an efficient way (E-delegationen, 2015).

2.4.1.1 Gradual implementation and life cycle perspective

It should be possible to implement digital collaboration gradually, the existing structures within the organisation and adjustment costs need to be considered, which will make it possible for the actors to participate on their own terms. Internal concepts and information exchange strategies need to be investigated, this includes existing models that could be reused. It is important to consider the entire perspective of the life cycle when it comes to developing solutions for digital collaboration. First, consider the needs related to usefulness and development. Then, consider analysing the management and the expected lifetime when it comes to the solutions and changes. Therefore, it is important to consider demands such manageability, availability and information security in early stages to implement sustainable solutions, but also to agree on how the collaboration group should be managed over time. If information is exchanged in a structured way, it will make the organisation more effective and will produce higher quality of work. But for digital collaboration to work, it requires that the exchanged information will be handled in the same way from every participating actor. The risk analysis and the procedure of demands will be more simplified if organisations are working more structured with information classification. The quality and effectiveness of service information management will improve, which could lead to lower costs thanks to the possibility to plan earlier (E-delegationen, 2015).

2.4.2 Technology Acceptance Model

The aim of Technology Acceptance Model (TAM) is to give an explanation of the general determinants related to computer acceptance, also to explain the behaviour of users. There are two specific beliefs that TAM postulates and are the main relevance when it comes to computer acceptance behaviours, i.e. Perceived usefulness and Perceived ease of use. Computer usage is determined by Behavioural Intention, in turn, Behavioural Intention is determined by the human's Attitude when using the system and Perceived usefulness, this will influence the actual use of the new technology (Davis, Bagozzi, & Warshaw, 1989). It is important to understand if people will use or will not use a new system, and that they believe that the new system will help them to perform better. Therefore, it is essential that the system is not too hard to use and that the system is accepted by the actual users (Davis, 1989). Figure 5 shows the relationship between those variables.

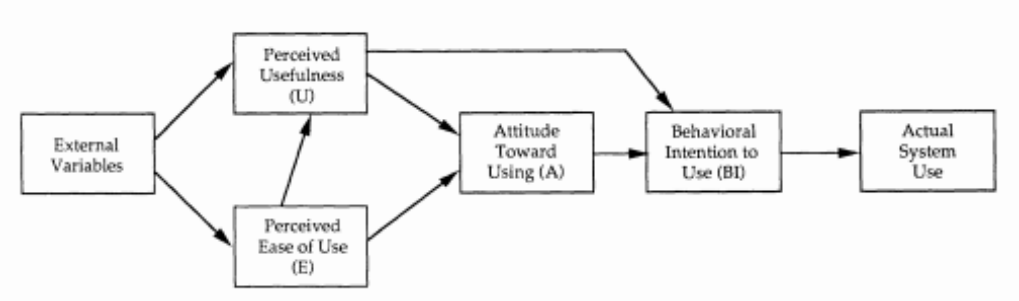

Figure 5 Technology Acceptance Model (TAM) (Davis et al., 1989)

2.4.3 Program of Technical Standard

The goal of Program of Technical Standard (PTS) is to strengthen the client's role with responsibilities for operating correctly from start with clear guidelines and instructions that established value related goals with solutions and can be reused. PTS is an IT-based management system that supports and controls the building process. One example is standard rooms with general solutions that county councils can use where the premises are flexible and general and can be used for different purposes. One aim is to lower the costs by doing right from the start, and unnecessary investigations and issues may be avoided at the planning stage thanks to detailed requirements. Organisations will have more efficient processes and the customers participation can be decreased in early stages by using proved solutions (PTSforum, 2017). A standardisation strategy tries to control and coordinate local needs in relation to the direction of the business and the scope in a planned and rational manner with strictly decisions. The standards are centralised and used in a similar way throughout the organisation, which will contribute to the overall efficiency (Fristedt & Ryd, 2004).

3 Methodology

This chapter presents how the research has been carried out it terms of research strategy and research design, data collection method, and analysis related to reliability, validity and ethics.

3.1 Research strategy and research design

Qualitative research was conducted in this study, which is concerned with human behaviour rather than numerical or statistical measurements as in quantitative research. This research design include interviews and observations, which fits the purpose of the research because the data will consist of words, texts, pictures, stories and documentation provided by the interviewees (Bryman, 2012). The data collection may be unstructured in the 'raw' form, but detailed and therefore 'rich in scope and content (Fellows & Liu, 2015). "Consequently, the objectivity of qualitative data often is questioned, especially by people with a background in the scientific, quantitative, positivist tradition. Analyses of such data tend to be considerably more difficult than with quantitative data, often requiring a lot of filtering, sorting and other 'manipulations' to make them suitable for analytic techniques" (Fellows & Liu, 2015, p. 29). When analysing the qualitative data, it tends to be laborious, involving analyses of the content of conversation and transcribing interviews. There are a variety of environmental and external variables that most likely will influence the data and results (Fellows & Liu, 2015). Bryman (2012) claims it is helpful to contrast qualitative and quantitative research strategies. The nature of social research and the research in the real world are both complex when conducting one of them. There are general tendencies, but in reality, the picture becomes complicated the more is investigated. Qualitative research is commonly described as concerning with generating instead of testing theories, but studies shows that qualitative research could be used to test theories rather than generating them.

3.1.1 Research approach

An abductive approach was chosen for the qualitative research when developing the theoretical framework, since the study focused on the perception of those who were interviewed. "With abduction the researcher grounds a theoretical understanding of the contexts and people he or she is studying in the language, meanings, and perspectives that form their worldview." (Bryman, 2012, p. 401). Instead of a natural scientific model that is value-free and where data is confirmed by empirical measurements, an epistemological position was used and can be described as interpretivist, where the focus is on the understanding of the social world through examination and interpretation by its participants. At last, the research has a constructionist ontological position instead of phenomenalism, meaning that social properties are outcomes of the interactions between individuals instead of being confirmed by the senses (Bryman, 2012).

3.1.2 Research process

To define research questions and the motivation of the study, a research proposal was conducted in the initiation phase. To set the scope of the study, relevant literature was reviewed and a test interview were held in order to develop an appropriate questionnaire for upcoming interviews. Afterwards, the interviews were transcribed, analysed and presented in the discussion/analyses and a conclusion were made. Initial studies are essential in order to provide a foundation for the research work. Since a research is a dynamic process, it must be flexible and a contingency approach may be helpful. Links

between problems, previous findings, methods, and theories was assumed in the initial study. The research must be conducted rigorously, and the study need to be objective, reliable, and valid (Fellows & Liu, 2015).

3.1.3 Literature review

A literature review was conducted to increase the understanding of chosen topic and to identify the challenges related to digital support systems. The research has been based on key words such as; digitalisation, E-government, IT-systems, digital public sector, digital administrations etc. Google Scholar and Chalmers library was primarily used to search through the literature. The reason for reviewing the existing literature is to understand what is already known in the area of interest, and to review the work of others in the field. Existing literature could be used as an argument about the significance of the research. It is essential to have a clear goal of what should be achieved in the process and is affirming the credibility of the theoretical section (Bryman, 2012). The meaning of exploring existing literature should according to Bryman (2012) be identified as following issues:

- "What is already known about this area?
- What concepts and theories are relevant to the area?
- What research methods and research strategies have been employed in studying this area?
- Are there any significant controversies?
- Are there any inconsistencies in findings relating to this area?
- Are there any unanswered research questions in this area?" (Bryman, 2012, p. 98).

3.1.4 Case study

Since the interviewees were key actors and each county council have their unique features, a case study design was suitable for this thesis. The analysis of the implementation of PTS was another reason why a case study was chosen. Case studies promote in-depth examination of instances in the research topic. The study may combine different data collection methods. Most common, case studies engage interviews as key actors in the study, and may be compared to archival data. A case study could be situational, and studied by combined or individual methods of ethnography, interviews, action research, and scrutiny of documentation. Although, the style of a case study research is considered distinct, and operate through theoretical generalisation instead of statistical/empirical generalisation (Fellows & Liu, 2015). Individuals and organisations have their own unique features, and the aim of the case study is to identify those features, and try to sort out various interactive processes at work, and to see if they influence the organization's functions and affect implementation of systems (Bell, 2006). "Critics of the case study approach draw attention to a number of problems and/or disadvantages. For example, some question the value of the study of single events and point out that it is difficult for researchers to cross-check information" (Bell, 2006, p. 11).

3.2 Data collection method

Empirical data was obtained by semi-structured interviews, and the purpose was to get a deeper understanding of the situation in the public sector. Bryman (2012) refers the approach as open-ended, and it depends on the research orientation and research questions.

3.2.1 Sampling in qualitative research

Purposive sampling has been used in the qualitative study with the reason that the respondents were selected based on their knowledge and relevance for the research questions. Bryman (2012) describes it as a non-probability form of sampling, where the researcher is not seeking to sample the participants on a random basis. Instead, the goal was to, in a strategic way, sample the organisations and people that were relevant to the research questions.

3.2.2 Interviewing

Semi-structured interviews were carried out and conducted to collect qualitative data. Literature studies was conducted and the theory was critically examined and analysed. Practice-based research was used in order to gain new knowledge about the subject. Face-to-face and telephone interviews were conducted in the study. The titles of the interviewees were Project Manager, Facility Manager, Consultant, Head of division and Business developer. "In seeking to research other persons' 'worlds' (their views, behaviour, etc.), 'we start with the experiencing person and try to share his or her subjective view" (Fellows & Liu, 2015, p. 158).

3.2.3 Transcribing interviews

The interviews were audio-recorded and transcribed in the study in order to get a thorough examination of what the respondents said. In a qualitative research, it is common to audio-record and transcribe the interview. It is not only interesting in what the interviewees say, but also in the way they say it. Although, it is a time-consuming process and every hour of speech may take five-six hours to transcribe and it is important to be realistic when deciding how many interviews are suitable for the study (Bryman, 2012).

3.2.4 Interview setting and context

Eight semi-structured interviews were carried out in the research, three project managers, two facility managers, one consultant, one from head of division and one business developer. All of them were working within county councils and had experience of the sector. The interviews were held in Swedish since it was the native language for both the researcher and participants. All respondents gave their permission to be audio-recorded and was given a copy of the transcription. Five of the interviews were held face to face and three of them were held by telephone since the distance were far away. The project scope and aim was explained to participant before the interviews, in order for them to understand why they were interviewed.

Participant	County	Role	Type	Time
Respondent 1	A	Project Manager	Face to face	70 min
Respondent 2	A	Facility Manager	Face to face	90 min
Respondent 3	B	Facility Manager	Face to face	90 min
Respondent 4	B	Project Manager	Face to face	80 min
Respondent 5	C	Consultant	Telephone	60 min
Respondent 6	D	Head of division (Construction)	Telephone	50 min
Respondent 7	E	Business developer	Telephone	60 min
Respondent 8	F	Project Manager	Face to face	70 min

Table 1 The interviewed respondents

3.3 Analysing

After each transcription, the result was analysed with help of NVivo, which is a software referred to computer-assisted quality data analysis software. NVivo made it easier to analyse the data and find relationships between the interviews. "Whilst this tends to be simple and obvious for quantitative data, coding may distort, or be part of the analysis, of qualitative data" (Fellows & Liu, 2015, p. 191). According to Fellows and Liu (2015) it is important to make the coding both easy to use and easy to understand, also, it should be at an appropriate level of detail. It is important for the researcher to develop sensitivity to the people, both in the language and how the language is used. Non-verbal behaviours of people are important in a way where nervousness and aggression may be discovered (Fellows & Liu, 2015). "In qualitative content analysis, emphasis is on determining the meaning of the data" (Fellows & Liu, 2015, p. 192). The purpose is the provide information and relationship between variables and to provide evidence of relationships that will help the researcher to understand the situation and can help support decision making (Fellows & Liu, 2015).

3.4 Research reliability and validity

It is important to reflect over the research reliability and validity when performing social research like this, and others should be able to draw same conclusions from the data. The data collection procedure should always be critically examined, and analysed in order to see to what extent the data is reliable and valid (Bell, 2006). "Reliability is concerned with the question of whether the results of a study are repeatable. The term is commonly used in relation to the question of whether the measures that are devised for concepts in the social sciences (such as poverty, racial prejudice, deskilling, religious orthodoxy) are consistent" (Bryman, 2012, p. 46). Validity is a complex concept that explains if an instrument or item describes or measures what it is supposed to describe or measure, although it is vague and questions are unanswered (Bell, 2006). "A further and in many ways the most important criterion of research is *validity*. Validity is concerned with the integrity of the conclusions that are generated from a piece of research" (Bryman, 2012, p. 47). Questions that are asking for opinions could generate different answers for a range of reasons, and if an item is unreliable, it must lack of validity. But in the same time, a reliable item does not have to be valid. It could generate similar or the same responses on every occasion, but does not have to measure what it is supposed to measure (Bell, 2006).

3.5 Research ethics

One important concern in researches is that ethical issues are far more extensive than recognised. Thus, it is important to be aware of the many other aspects of moral and ethical concerns for research, including use of the work of other people (i.e. proper referencing and avoidance of plagiarism), confidentiality and integrity in collecting data, analysing data and reporting and disseminating results and findings (in particular, data relating to human subjects) (Fellows & Liu, 2015).

The suggested research will need to consider the following ethical issues according to Northumbria University handbook:
1. Protecting Confidentiality and Anonymity was offered to people involved in the research. For example, using letters or numbers instead of names.
2. Maintaining independence and impartiality as a research topic owner.

3. Data was stored and destroyed securely in accordance with University guidelines, e.g. make sure that only myself and the supervisors will have access to the information.
4. Information to be provided to all participants, e.g. provide the research to the interviewers. Participants have the right to withdraw their information from the research, but no right to edit the information in the final dissertation, if names are not exposed.
5. Participant consent to be obtained using the standard Research Participant Consent Form or otherwise in accordance with Faculty procedures.
6. Adherence to Data Protection Act.
7. Commercial confidentiality to be provided to organisations'.

4 Empirical Findings

In this chapter, the empirical findings from the interviews are being presented. First, what the challenges are with digital support systems. What the opportunities are with digital support systems. What is used today. Systems for sharing information. What is missing. Then, to what extent they use PTS. What the challenges are with PTS. What the opportunities are with PTS. And lastly why usefulness is important.

4.1 Challenges with digital support systems

One potential challenge is the lack of experience and lack of competence. There is a lack of practical experience that cannot be taught through manuals. We have been living in a paper-based society, and now there are new ways to look at it through the digital world. There is a challenge in each project having its own web page and having all of the information stored securely without risking missing something.

"You may not know what it means, how much it costs, how to use it, what kind of software you need, how frequently do you need to update the systems, who the owner is." (R3)

The processes take a long time and the reference projects could become outdated. There could be many years from the stage where one has decided how it should look like up until the project is finished and the requirements and specifications can be old.

"We are probably in the stage where we will think more about standardised solutions and standard rooms and so on." (R3)

There are usually short-term solutions, and one issue is that new systems are founded all the time and the information is supposed to be stored at a different place than the last time. It could be confusing and difficult to find what you need among all the different tools. There could be a project stored digitally somewhere but no one knows where. There is a growing awareness of these challenges.

"I do not feel that there is a resistance, the challenge is to find the right tools, and understand what you need. You want something you know will work for a long time, a structure that is recognised in a few years." (R3)

It takes time to develop a system and to make it as useful as possible, it is a long process from developing it, to implementing it, and making the employees use it. The tool must be easy to work with.

"It is especially the time, and to make it sure that the system will be used, that it is really being used, to force everyone to use in instead of using their own template." (R6)

There is a large amount information in every project with different action plans and drawings. Each project leader works with their own tools, and there are a lot of different systems where the platform is not the same, which makes it hard to have a standardised solution that works everywhere. There is a need of combining digital systems in order to handle all type of documentation in the same place.

"It is hard to handle the amount of documentation we have in a project." (R4)

One possibility to use the same system is that everyone can work more alike, but the challenge is to get enough users that could force others to use it. It is essential to work after same structure and with similar tools. Other important factors are: making the change management work, and to give instructions on the digital solutions, make it user friendly and make sure it is actually used. It should not be a choice, it should be compelling.

"The problem is to get everyone to start using the system, and use the same system." *(R7)*

One problem is that new things are added all the time but old ones are not erased, it makes it more expensive and is not leading to rationalisation or change. For example, when building a hospital today, there are old dimensions that are no longer used in health care facilities. Things are bought that no longer are needed or used. Multi-professional teams are needed to handle digital questions and technical areas in early stages, in order to collect experiences and to develop the agile way of thinking to create a standard.

4.2 Opportunities with digital support systems

Most of the respondents believe there should be a way to build and store knowledge that will be used over time instead of changing the way of working each time, which will cost more and be more time consuming. There could be a repertoire of solutions. With no experience, you probably need more support systems and for that there are lack of tools. With time and resources, there are many digital solutions to use but it is important to find a balance in the projects and understand what is actually needed and not only nice to have.

"Yes, absolutely. Well, I think so. As I said, we are working with different projects at different places, and I think it will be more like working around a specific model which the majority will work according to in some way." **(R4)**

There could be a VR-tool with several standard rooms with different options and solutions, and where it is possible to see why to choose standard room A instead of standard room B. It would be worth a lot, to have virtual standard rooms in early stages of the project.

"Although, there are enormous possibilities to work more digitally, to use existing technical solutions. I believe that you work too little with those kinds of questions in early stages of the project." **(R3)**

4.3 What is used today?

It is primarily about experience, and PTS is working as a toolbox where a checklist is used in a chronological order.

"You have a list in chronological orders, you have to do this before you do that. There are 184 points in the checklist from the top to the bottom." (R1)

Many of the interviewees explain that there is a lack of a structured way when working digital support systems. There are no digital support systems for the projects, but there are a lot of discussions around it and it is needed.

"But there is no such thing today, but I think Excel is used, but others may have more sophisticated systems for their follow-up, for example. But it is very different and interesting to see what other use." (R2)

The way of working in projects is depending on different experiences and what the ones who are in the project are most confirmable with. It differs from project to project.

"Well, when we are working in a project there are various project portals such as, Apricon, Project place and docs. Everyone is working with those in the project, but there is not a specific system to use, we are working more project-specific." (R4)

There are such systems but it seems like they are not working actively with them. There are no structures, but templates are used and there is a visionary plan used for larger projects with long time-perspectives. Templates and structures exist, but not a systematised way of using them. And it seems to be common that regions use their own systems developed by their technical service.

It seems to be a diverse way when working with digital support systems. There are separate systems for investment errands, economical follow-ups, and the projects. Some of them do not give enough information for larger project and Excel templates are used instead. There are systems like hyper doc for handling documents and drawings and those systems are improving constantly. There is a need to formalise the hand-over phase, and to make it more understandable what is required in the different phases, and make the routines better.

"We are simulating in databases through Excel." (R5)

4.4 System for sharing information

There are cultural differences when it comes to exchanging information and experiences geographically and there is no structured way of doing this. The challenge is that each person has developed their own way of doing things and they work in the way they think is best, and it could be hard to tell them that they should work in another way.

"It is a challenge to have a good experience sharing system between the geographical teams." (R2)

There is no specific database, instead the employees save older projects so it is possible to analyse what they did in a project, but there is no systematic way of doing it. It is up to each one how much they want to engage and how much they want to learn. Others explain they have a process to collect data.

"Everything is gathered and hands over in central databases, it is possible to go in to a project and collect drawings or whatever you need." (R4)

4.5 What is missing?

This is an important question to ask. It is related to what experience you have, and you will get a new answer each time if you ask different people with different experiences. And it seems that the respondents have different views of what is missing, some of them have enough tools, others do not know what really exists and think they need complementary tools.

As a project leader, there is need for a better knowledge of construction processes and suggestions how to handle and work in different phases. Maybe a toolbox with guidelines how to use them.

"There are a lot of helping tools, but you need to know about them." (R8)

Templates exist for reporting, drawing sheets and models, but there is no clear structure for what it should include how it should be used. A formalised process is missing that contains a common place for sharing experiences.

"I believe tools are needed, and there is not a clear process to follow. I think that guiding tool would have been great." (R8)

There seems to be an unawareness of which tools should be used and a lack of an overall function. They work in different systems, and are missing a tool for resource planning.

"We have a management system today but the digital platform is missing many things." (R6)

Those who are experienced bring their own tools, which are not always adapted to all stakeholders.

"I believe we need a tool in a more robust system and a culture for how we should work in the projects." (R8)

It is important to find a model that works with early stages, to gather information, it should be easy to find documents and a structure that looks quite similar everywhere. It should be possible to analyse projects and a digital tool could be helpful in many ways.

"We look after a tool or platform where we can storage our projects, and where we gather everything, and where it is possible to make calculations and timetables etc." (R6)

There could be too much attention to individual management and reviewing local needs, but there could be better coordination and collaboration between others.

One respondent does not think there are any tools missing, but feels that there is some issue with time when working with the feasibility study and it is hard to make is as good as possible. Sometimes there is not enough money for the feasibility study, but the largest issue is that there is too little time to make it good.

"I cannot say that I miss anything right away. I feel that we have the tools we need in the projects. One thing I am missing, is to have a better system for follow-ups, to have a bank of experience from the projects." (R4)

4.6 To what extent do you use PTS?

Some of the interviewees state that they use PTS, and think it is important with the reason that it works well at times. PTS-projects involve several steps that support project managers. However, the implementation of PTS is still in its early phases.

"Which we started to use one year ago." (R1)

The PTS-system includes a checklist with more than 180 points and different images of the process involving resources, start-up meetings with the house guest, lead and steer feasibility studies with an additional check list that works as a helping tool not to forget important tasks. The aim is to make the flow much simpler from the project phase to the hand over phase. PTS is used to receive internal advice and to gain knowledge from each individual local planner, although there are other processes for that to some extent, but not as structured.

"We have the PTS-program as the local planners has. We are fully working with it." (R1)

PTS is used relatively often, but at different levels in different projects. There is a desire to take advantage of each other's experience. One respondent explains that they struggle to get people to use it. The issue is that they have not managed to make it a requirement to use it and instead it is a choice.

"It is from person to person instead of being implemented in the processes and the steps that should be followed." (R7)

Several other interviewees state that they recently have joined PTS and do not use it at all. They have not had the time to implement it to ongoing projects. PTS has not fallen into place in many projects yet, they have not started to use it properly yet but expect it to gradually be implemented.

"We use PTS very little from my point of view, and I believe we need to use it more." (R3)

It looks different across the different regions, and some are expected to be introduced to it soon whereas others have been enthusiastic when it was introduced to them, leaving them wondering why they did not work in that way already.

"Well, we recently joined PTS and it must fit for a project in time and there must be advantages of using it." (R4)

4.7 Challenges with PTS

More and more county councils are joining PTS. But in some cases, it is not clear what it is about, there are standard rooms but probably it will include experiences from others. It seems to be in an early phase and many have not started to use it yet. Every

respondent recognises PTS, some of them have no impression of it and have no grip on what is in it or what it is for. One respondent thought it would be a long list of projects to look at.

"Everything is not included in PTS, I do not know exactly what is in there, maybe it depends on what you are supposed to build." (R4)

There are comments that the standards in PTS are rigid and they do not fit everyone. They create standards and call them concepts and when they were created it was a different equipment needed and the rooms do not have to be that large today.

"I know very little, but I have the feeling that it is far away from the business. It lives its own life. But that is only my feeling." (R5)

One respondent argues that their architects are not very glad when they are told work according to PTS. There is no unwillingness but the architects are probably feeling too steered and that PTS would hamper their creativity to find new solutions. Maybe, they are frightened of the standard rooms. On the other hand, another respondent explains that it is essential to be able to steer the architect and that they should not be innovative in every project. Innovation is great but to build uniquely designed rooms every time is not the point.

"I can feel if we invest much time and money in the development of PTS, and if we not use it in our projects, we are wasting resources." (R7)

One respondent explains that there is a mix of binders and computers and none of them are complete. The computer is both a helping tool but also a non-helping tool. You rely on it but it could be a hinder because you are not one hundred percent anchored.

"All respect for the computer but if you go back in time each project had a structure of binders, then you knew every paper in there because you did not have anything else." (R1)

Security is an important challenge for another respondent and explains that if the information is out in the cloud, there has to be a way to secure the data, and that it may be easy to ignore sometimes.

4.8 Opportunities with PTS

When working with healthcare, there are several regulations, and PTS is a refinement of current regulations, a supplement to the current regulations. The standard rooms in PTS include such regulations that we use and if a new local planner joins the project, it is possible to look into that package and use it in your own basket. Every room should look like that and preferably it should look like that across Sweden, therefore there are 16 counties that have joined PTS. There are similar rooms and no need reinvent the rooms every time. The point with PTS is to have a basic standard, and it would be easier to tell the clients that this works in 15 other counties, why would it not work here?

"It was in that direction I initially worked with in the primary health care, already then we started to work with standard rooms to speed up the process and not start with a white page because it is very time-consuming." (R4)

A lot of the respondents believe standard rooms are great to some extent. Many of the clients are single-time orders and have not worked with construction projects very often and have no routine for it. It would be easier to have a standard offer as a proposal that could be 80-90% accurate every time. There seems to be competence for doing this.

Most of the respondents argue that a common database is interesting, and it would be great to have access to other's information when they had the same type of project. It would be worth a lot and beneficial to compare similar projects. A database that is easy to use and to take advantage of other counties. Information like how they think and what they have said in their feasibility study.

"Yes, and that is the way I understand PTS is supposed to work like, a library where it is possible to go through data." (R3)

It is important not to be too open, we are building important functions in the society and everyone should not be able to have access to detailed information of the hospital for example. It is important to think through what information should be available in that kind of forum. There must be advantages and benefits when sharing information to others.

"It is the taxes money and I believe that we should collaborate with others and use each other's successes." (R3)

4.9 Usefulness

It is important not to spend too much on different digital solutions, it has to be some robustness in what you do and it cannot be too complex. Everyone need to be able to use the system through the whole process. There has to be a demand of right solutions and it is important to find a balance between usefulness and what is actually needed. There are no limits in what you can do, and it is important not to push the digital solutions too far, try to find a reasonable level instead. There are a lot of technical solutions but simply because there is a digital solution, it does not mean that you need it.

"So somewhere, it has to start with a need. What is needed and follow up those things. You might want more dialogue about it." (R4)

You have to know what is needed and after that it is possible to find and use different systems for it. It is easy to put too much focus on the systems.

"But often it becomes too much focus on a system, it is common to focus too much on the system instead of what you actually should do." (R5)

5 Discussion & Analysis

In this chapter, the empirical data is reviewed together with the theoretical frame of reference in order to answer the research questions. The discussion is divided into four parts. First a structured way of working. Second, opportunities and challenges with digital support systems, and what is missing? Followed by challenges with digital collaboration and what is PTS used for? Lastly, the development of digital systems.

5.1 A structured way of working

Most of the interviewees agree that experience is an important factor when working in projects. It seems to depend on the experience when it comes to choosing digital support systems, they use the system they are most comfortable with, and that differs from project to project. There are a lot of systems, but many of the interviewees explain that they do not work with them actively. There is a diverse way when working with digital support systems, and they use different tools for investment errands, economical follow-ups, for the projects, for handling document, drawings etc. Which is aligned with the benefits found in the theoretical framework regarding what digital systems can provide, i.e. codifying the knowledge base, linking and enabling employees, increasing boundary spanning, enhancing coordination and collaboration, and improving information processing (Orlikowski & Scott, 2008). As stated in the theoretical framework, digital support systems will help to shape practices, procedures, and assumptions in an organisation. Digital systems could be important from a quality and a business perspective, and have the potential to contribute to change and development management (Andréasson, 2015). And as many of the interviewees explained, there was a lack of a structured way of working with digital support systems. Therefore, it is essential for them to find a structured way of working, everyone in the organisation should follow same guidelines and procedures, the working process should be similar in every project and similar tools and digital support systems must be used in order to be more efficient and cost-effective.

Collaboration is a key value when it comes to implementing digital support systems in the public sector and actors like, public, private, and non-profits should be working with each other towards the same goal. IT has created opportunities to organise through processes and has the possibility to increase the capacity of communication, computing power, and integration capabilities (Orlikowski & Scott, 2008). Digital support systems are often seen as a tool for increasing efficiency, productivity and reducing costs. But there is no evidence that implementation of digital support systems will make this happen automatically (Rose & Persson, 2012). It is important to consider what values digital support systems will have impact on, where values such as accessibility, quality, efficiency and security is worth to consider. A system such as PTS may be able to enhance the collaboration across Sweden, if every county council works with similar standardised solutions and goals it will contribute to the overall efficiency.

5.2 Opportunities and challenges with digital support systems

As one respondent pointed out, there is a large amount of information in every project with different action plans and drawings. There are many different systems without a structured platform which makes it hard to have a standardised solution that works everywhere. There is a need of combining digital systems in order to handle all type of

documentation in one place. Pollitt (2011) explained that technology will increase and change the speed of communications and computations. It has the potential to improve public administrations when it comes to efficiency, services, transparency etc. Andréasson (2015) claims that digital support systems have the potential to create structured internal processes and the information will be distributed in a more efficient way. Orlikowski and Scott (2008) state that technologies are understudied in organisational research, and the absence of technological issues is a serious concern.

In some places, it seems to be a mix of computers and binders when storing information, leading to none of them as complete. This shows the impact of digitalisation and people needing to adapt to the new ways of working. Andréasson (2015) explained that new digital support systems lead to internal changes in public organisations, the day-to-day operations will change and the working tasks may change, and new tools need to be learned to be able to control the organisation. The author argue that it is recommended for every organisation to find a way to adapt to the drastic changes towards a digital working era. Everyone within the organisation needs to be able to work with new tools and therefore internal education is important.

One challenge explored under the interviews was the lack of experience and lack of competence when it comes to digital support systems. The digital world is expanding, the paper-based society is decreasing and everyone needs to adapt to it. Studies show that common issues are lack of internal expertise of the digital area in public organisations when they are implementing digital support systems. Therefore, it is essential to be careful when considering the extent of which practices, models and assumptions of governance can sustain when creating digital support systems. Navarra and Cornford (2012) explained that E-government should be considered as a vehicle for transformation. And according to Andréasson (2015), digital changes will not change the public organisations in a revolutionary way, instead it has the possibility to strengthen existing structures. When developing the digital collaboration, it demands different key competencies, and technical expertise is not enough. When managing digital systems, it requires a common understanding of the concept, legal conditions and information security (E-delegationen, 2015). All the above is worth to look into, if there is a lack of experiences and competencies regarding digital systems it is a problem that needs to be taken care of immediately in order to develop Swedish county councils.

One possibility when using the same or similar digital systems is that everyone can work more alike, but one challenge is to get enough users that could force others to use it. The author believes it is essential to work under same structure and with similar tools. When developing a digital support systems, it is important to make it useful and easy to use, but also to analyse the attitude of the people using it and see if they actually tend to use it. If the system is great, it should not be a choice to use it, it should be compelling.

When working with healthcare, there are several regulations, and PTS is a refinement of current regulations. The standard rooms in PTS include regulations that could be used in every county council, the rooms should be similar and there is no need to reinvent the rooms every time. According to Fristedt and Ryd (2004), a strategy for standardisation aims to coordinate and control local needs in a direction that is desired, and it would be efficient to use standard rooms in all county councils.

In order for digital collaboration to work, it is essential to have a shared understanding regarding objectives and needs. The counties and municipalities have comparable organisations, identical regulations and tasks, meaning they have the opportunity to use similar or identical digital systems. Andréasson (2015) explained that the potential of digital solutions is at a stage where it has the potential to contribute to radical management changes. This is needed today; radical changes are needed to improve the way of working in Swedish county councils.

5.3 What is missing?

It seems that the respondents have different views of what is missing and it depends on what experience the person have, some of them have enough tools, others do not know what exists and think they need complementary tools. One explained that as a project manager, there is need for a better knowledge of construction processes and suggestions on how to handle and work in different phases. Perhaps there is a need for a toolbox with guidelines on how to use them. There are templates and models, but the issue is that there is a lack of a clear structure for what it should include or how it should be used. A formalised process and a common place for sharing experiences is missing. It seems to be an unawareness of which tools should be used and a lack of an overall function and there are so many different systems used across the county councils. Those who are experienced bring their own tools, which are not always adapted to all stakeholders. It is important to find a model that works with early stages, to gather information, it should be easy to find documents and the structure should look quite similar in every county council. According to the theoretical framework, there are similar challenges in the literature as those explained by the interviewees. There is a challenge to standardise and apply standards in a common way for the actors, and there is a risk that the new way of working is described differently and that new solutions are produced for each need that arises, whereas standardised solutions would be possible to reuse. Another challenge is that the definition of concepts and designations are usually not uniform and public which makes it difficult to reuse information. Actors do not have a unified view of what internal concepts stand for and in what way the information should be structured. This could lead to miscommunication and difficulties to collaborate in an efficient way (E-delegationen, 2015). Most of the respondents believe there should be a way to build and storage knowledge that will be used over time and not be possible to change that way of working each time, which will cost more and be more time consuming. There could be a repertoire of solutions. With no experience, one probably need more support systems and for that there are lack of tools. With time and money, there are many digital solutions to use that can be used, but it is important to find a balance in the projects and understand what is needed and not only nice to have. There should be a structured way of working around a specific model which the majority will work according to in some way. PTS is a tool that have the possibility to include all those things above in the future, but in this stage, it is too early to tell.

More and more county councils are joining PTS. Although, one issue is that many of the respondents did not know what it was about, they knew about the standard rooms but not much more. The reason is probably that the implementation of PTS is in an early phase and many have not started to use it yet. Goldkuhl (2014) explains when developing a network, it often involves large temporal challenges, which could require long-term development budgets in the coordination of administrations. Economic

issues are often difficult to handle in the administrative cooperation, and it may be hard to ensure the cost of investments. Also, there could arise uncertainties among the public administrations when managing common resources, and sometimes a lack of understanding the concept of shared digital development (Goldkuhl, 2014). Those are issues that may concern PTS and is worth to consider when trying to implement it properly.

It is a challenge to share experience between the geographical teams. There are cultural differences when it comes to exchanging information and experiences geographically and there is no structural way of doing this. There is no certain database, they are saving older projects where it is possible to analyse how they did in a project, but it is not a systematic way of doing it, it is up to each one how much they want to engage and how much they want to learn. A common website involves a collaboration of information and services. But there are challenges when building a common website, e.g. that the governments have different IT-systems which can make it hard to implement and manage them all at the same place (Goldkuhl, 2014). PTS is a similarity to a common website, where information can be stored and exchanged across county councils, if they start to use it properly it may be the solution for this. Most of the respondents argue that a common database is interesting, and it would be great to have access to other's information when they had the same type of project. Although, it is essential that the database is easy to use, and is actual used all the time. For this to work they must understand the advantages and benefits when sharing information with others.

5.4 Challenges with digital collaboration

One of the greatest challenges when two or more actors want to collaborate in a digital way is the ability to look outside the organisations, and in the same time maintain the customer focus over time. Technical concerns are not that big of a problem anymore (E-delegationen, 2015). Another challenge is that lack of interest and different views on administrations may become a risk in the development process. There is also a risk for lack of competence among several administrations when operating with digital systems (Goldkuhl, 2014). A challenge when using a digital tool for collaboration such as PTS is that the standards may be rigid and not suitable for everyone. There were comments that the architects were feeling too steered when working according to PTS and that it would hamper their creativity. Although, there is no need for the architects to innovate new rooms every time, and if they are frightened of standard rooms, it is important to be able to steer them towards the most efficient way of working. There are also challenges not to pay too much attention to the individual management and only reviewing local needs and the collaboration and coordination must be developed between different county councils. E-delegationen (2015) stated the same issue, that actors usually focus on their own organisation instead of analysing the information structures and processes from a wider perspective, which can make the solution limited and will not solve the customers' total needs.

5.5 What is PTS used for?

Some of the interviewees state that they use PTS, which involve several steps that support project managers. Those steps are e.g. resources, start-up meetings with the house guest, lead and steer feasibility studies with a check list that works as support documents and it also is a helping tool not to forget important tasks. They have tried to make the flow much simpler from the project phase to the hand over phase. PTS is used to receive internal advices and to gain knowledge from each individual local planner,

there are processes for that to some extent, but not structured. But PTS seems to be early in the process since not many have started to use it yet. This is in relation with what Moon (2002) concludes in a study that many municipal governments have adopted E-government but it is at an early stage, and has not achieved a lot of expected outcomes such as downsizing and cost savings. Several of the interviewees state that they recently have joined PTS and have not had the time to implement it to already started projects. It is important that PTS is suitable for a project in time and there must be advantages for using it. Conclusions can be made that PTS have not fallen in to place in many projects yet, and many of the interviewees have not had the time to use it properly. But hopefully PTS will be gradually implemented. This is what E-delegationen (2015) explains, digital solutions and digital collaboration should be implemented gradually, the existing structures within the organisation and adjustment costs need to be considered, which will make it possible for the actors to participate on their own terms. Despite that, internal concepts and information exchange strategies need to be investigated, this includes existing models that could be reused.

PTS seems to be used in different levels in different projects and the tools are more dependent on the persons than is desired. There is a desire to take advantage of each other's experience across the county councils. One respondent explained that they struggle to get people to use PTS and the issue is that they have not managed to make it a requirement to use it and instead it is a choice and situational. As the theoretical framework states: If information is exchanged in a structured way, it will make the organisation more effective and will produce higher quality of work. But for digital collaboration to work, it requires that the exchanged information will be handled in the same way from every participating actor. The quality and effectiveness of service information management will improve, which could lead to lower costs thanks to the possibility to plan earlier (E-delegationen, 2015). There are so many reasons for using a similar digital system in the county councils, but PTS needs to be evaluated even more and used even more in order to see what benefits it may bring.

5.6 The development of digital systems

One thing to understand is that it takes time to develop a system and make it as useful as possible. There is a long process from the development stage, to the implementation stage and not at least, get people to use it. For the employees, the digital system must be obvious to work with and the county councils must find a balance between usefulness and what they actually need, and there has to be a demand of right solutions. Today, there are no limits in what you can do with digital systems and there must be an awareness of not pushing digital solutions too far, and instead, finding a reasonable level of useful technology and only use what is needed. It was mentioned that there are usually short-term solutions when it comes to digital systems, and there was an issue that new systems were founded all the time, which makes it hard to know where to store all the information. Projects take time and there are long processes within many projects, which means that the digital systems must be up to date all the time and include updated requirements and specifications. Orlikowski and Scott (2008) explained that the digital world is a fast-moving field with a lot of changes over time, meaning that methods and approaches need to be developed frequently. It is also important not to spend too much time on different digital solutions and they should not be too complex in order for everyone to use them. Therefore, is the entire life cycle perspective important to consider when developing digital systems, and demands like availability, manageability, information security needs to be evaluated in early stages. Time is

another challenge when developing digital systems, and usually there is not enough time to make it great and as useful as possible.

6 Conclusion

The purpose of this study was to examine the use of digital support systems in public organisations. The use of digital systems is escalating and there are many challenges, but also opportunities when implementing such systems. Digital collaboration is a central topic in order to get a more efficient public organisation.

The public sector is in need of being more efficient, productive and be able to reduce costs. There is a need for a more structured way of working to create a knowledge base, enhance coordination and collaboration, and improve processes when sharing information. Digital support systems offer a way to shape practices and procedures in the public sector. Today, most of the organisations use digital support systems in different ways. It all goes back to what experience the person who own the project has, it seems like they choose digital support systems that owner of the project is most comfortable with, meaning it differs from project to project when it comes to digital tools. Collaboration is a key value when implementing digital support systems in the public sector, there are opportunities to organise through processes and there could be better communication channels, computing power and integration capabilities with functional digital support systems. But it is essential that everyone work towards the same goal, and there is no evidence that implementation of digital support systems will make this happen automatically.

The potential of digital support systems is enormous when it comes to improving the public administration, efficiency, service, interactivity, decentralisation, accountability and transparency. Internal processes can be more structured and information can be exchanged more efficiently. The challenge is that there are too many different digital systems used today, which makes it hard to build a structured platform with standardised solutions. Another challenge is the lack of experience and competencies when developing a digital support system, which makes it essential to be careful when considering the extent of which practices, models and assumptions of governance that should be included. E-government should be considered as a tool to strengthen existing structures and a vehicle for transforming the public organisations to the new digital era.

Conclusions can be made that some use PTS fully, but others have recently joined PTS and have not had the time to implement it properly. It seems that PTS is in early stages at many organisations and they use it in different depths in different projects. Although, there is a desire of taking advantages of each other's experiences. There is a struggle to get people to use PTS but hopefully, more and more will understand the advantages of it and will continue the implementation gradually. If the implementation of PTS succeeds, Swedish county councils has the possibility to become more efficient with a better quality of work, have a better way of exchanging information and be able to work in a more structured way. Most of the respondents believe that a common database is interesting, and it would be great to have access to other's information when they had the same type of project and that it would be worth a lot and beneficial to compare similar projects. A database that is easy to use in order to benefit from other counties.

One thing to remember is that it takes time to develop a digital system, the process is long from development to implementation as well as the evaluation of whether it is useful and needed. Therefore, there are usually short-term solutions which makes the organisation structure a mess with a lot of different solutions and the employees do not

know what to use. And it makes it difficult to find what you need among all tools. For that reason, it is important to consider the entire perspective of the life cycle when developing digital support systems. It is a fast-moving field with many changes over time. Approaches and methods need to be developed over time, and updated frequently. Lastly, it is important not to spend too much time on different digital solutions, the system needs to be robust and not too complex in order for people to use it, and it is essential to find a balance between usefulness and what actually is needed.

Suggestions for further research

Suggestions for further research is to make an investigation of PTS when it is fully implemented in most parts of Sweden, this would allow for further conclusions as to whether PTS is the kind of digital support system that is needed today, or there is something else that needs to be implemented.

7 Recommendations

Implementation of a digital structured working process
Since the Swedish county councils need to become more efficient, productive and reduce costs, there are recommendations to implement a digital support system that makes it simpler to work in a more structured way and is enhancing collaboration and coordination. A standardised system that creates a knowledge base with processes when sharing information. It is essential that everyone works after the same structure and uses similar tools to improve the collaboration and coordination with others.

Collaborate with others
Another recommendation is to embrace the key value **collaboration** when implementing digital support systems in Swedish county councils. There is no competiveness between county councils for example, and there are opportunities to collaborate on a different level. There are also opportunities to exchange information and reuse each other's experiences. There must be better communication channels and a common database that everyone can use.

PTS is maybe what they need
PTS seems to be in an early stage in many organisations, and it is hard to evaluate if it is the right solution for different problems stated in this report. Although, PTS has the potential to create changes within Swedish county councils and the recommendation is to try it when possible. It would be interesting to evaluate how it works when the majority of county councils have implemented in fully and started to use it properly.

PTS should be a tool that includes the following:
- Obvious to work with and easy to use
- A common database with access to other's information of similar projects.
- A formalised process and common place for sharing experiences.
- An overall function with a toolbox with repertoire of solutions, and a guide on how to use them.
- A module that works with early stages, to gather information, easily find documents and a structure that looks quite similar everywhere.
- Offers a robustness in what you do and is not too complex.

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