



From IT solutions to citizen benefits

A case study of IT value in a public sector context.

Anton Eriksmo

Johan Sundberg

Abstract

While the increase of IT solutions within the public sector is well established, the actual value of IT is still a question of debate. This thesis consists of an interpretive case study focused on how IT is perceived to influence public value creation in a local government. The study was conducted in a strategic IT project department at a local government in Sweden. Our findings show that the IT solution is ignored when assessing the created public value. The created values importance is instead based on subjective opinion and the targeted citizen group despite the acknowledgement that IT resources directly used by the citizen created higher public value. In addition the prioritisation of public value was perceived as more difficult than determining the IT value in itself. Our research show the need of understanding how IT values compare to each other in order to use public resources more efficiently.

Keywords: Public sector, IT value, Public value, Government IT value, IT resources, Organisational capabilities

1. Introduction & research question

Information technology (IT) is playing an increasingly important role within the public sector both towards citizens as well as the internal organisation (Symonds, 2012). There is an increasing focus on a value first approach when assessing IT solutions instead of focusing on IT performance (Glaser, 2009). This technology enables new possibilities to provide services and to interact with citizens which in turn helps government organisations to evolve their service processes and to create more efficient organisations (Teicher, Hughes & Dow, 2002).

Given IT's possibility for value creation within government organisations, it becomes increasingly important to determine what IT value really is and how it can be perceived in a public sector context. Assessing critical criteria for IT value is in itself a difficult undertaking due to the potential difference in stakeholder expectations. Defining IT value within a government organisation proves even more challenging considering the sheer amount of stakeholders represented among the government's citizens. Consequently the perceived public value becomes an important aspect that affects the prioritization of IT projects within the public sector. Even if the public value can be identified, a challenge still remains to determine which created public value is more important than the other when facing two different IT solutions targeting different citizen groups.

While the subject of IT value has been extensively researched, it has mainly focused on the private sector (Pang, Lee & Delone, 2014). The private sector is however ruled by different aspects than the public sector which creates a demand for different methods of measuring IT value when within a public sector context (ibid.). There are however still questions regarding how IT value is perceived in a government context and what role IT have in public value creation. This paper will build on government IT value research by studying an external IT project evaluation organisation working within the public sector. Our aim is to add knowledge to the understanding of IT value within the public sector and how the created

public value is assessed. In order to expand the knowledge in this field we will answer the question:

- *How is IT perceived to influence public value creation in local governments?*

Our research question will focus on the value creation process which involves both identifying potential value in the IT solution and deciding between different potential values when faced with IT solutions that target different citizen groups.

Below follows a literature review of existing research within IT value, public value and government IT value. We then describe the theoretical framework and methodology that is used in this thesis. This is followed by the data analysis and results which leads to a discussion of the results. The paper ends with conclusions and suggestions for future research.

2. Literature review

2.1 What is IT value?

Historically there have been many studies conducted concerning IT value in organisations. However, most of them are centred around the private sector and focuses on financial aspects (Kohli & Grover, 2008). Fewer attempts have been made in trying to understand the role of IT resources when creating value within the public sector (Pang et al., 2014). Since this research paper is situated within the government IT valuation field, and aims to contribute to that research by studying IT valuation in the public sector, we summarize existing research concerning IT value, Public value and government IT value. Furthermore we present research connected to IT's role in public value.

2.2 IT Value research

The aim to find a link between IT investments and financial gain has been the focus of many studies within the private sector (Im, Dow & Grover, 2001; Khallaf, 2012; Rai, Patnayakuni & Patnayakuni, 1996). Some argue that unless there is an economic gain, no further value can be obtained from the IT artefact (Kohli & Grover, 2008). However, not all IT investments are undertaken in order to seek financial gain (Soh & Markus, 1995) and different models need to be developed in order to understand the actual value gained from IT investments (Rai et al., 1996; Khallaf, 2012). These models would shift the focus towards measuring organisational performance which can be greatly improved by IT but is not directly measurable in monetary profit. Since these factors are harder to measure and understand they are often overlooked in the private sector which primarily concerns itself with economical aspects and performance gains (Rai et al., 1996).

IT can also be seen as an enabler of value creation rather than a creator of value in itself. It has been shown that the mediary role that IT provides creates a more integrated organisation that allows different departments to create value through cooperation with each other. Furthermore IT adds value by simplifying communication between managers which allows a higher level of information transferring. It is noted that within the private sector, consideration must always be taken if the investment can be easily copied by others and

make the investment less valuable. (Dong, Xu & Zhu, 2009) This can also be observed in the public sector where framing of the IT solutions created citizen value is important in order for it to be perceived as a positive implementation (Meijer, 2015).

When looking at the IT value research field a lot of emphasis has been put on the financial and competitive gains of the IT artefact. However, as the research shows other factors such as organisational performance, integration between departments and managerial communication also play a role when defining IT value.

2.3 Public value research

In order to understand IT's role within the public sector one must first define what the public sector is and what is considered valuable in that context, which is not a straightforward task. As the IT value research showed, value in the private sector is mostly connected to economical gain.

Meanwhile, research into public value have historically evolved from shifting ideologies within governance and public management research that traditionally focused on the providing of goods to clients or the creation of choice to customers. The shift in focus towards public value co-exists with the perception of citizens as co-creators in products and services. (Layne & Lee, 2001; Hartley, 2005)

Defining public value in itself however is a difficult undertaking since both value and public are terms that spark debate. Within the term public value, value can be perceived as a concept of something that is desirable to an individual or a group. It can also be viewed as an object of need, something that is appreciated or something that satisfies a motivation. (Meynardt, 2009; Moore, 1997) Despite the hard to define nature of what constitutes value in the public sector the individual perspective, or rather the subjective view of value, remains a common theme in the different definitions.

Compiling on the complexity to define public value is the understanding of the word public within public value research. As previously stated, research into governance and public management define the recipient of value differently (Hartley, 2005). Thus the word public can be perceived to refer to a client, customer or consumer as well as a citizen (Meynardt, 2009). Because the views of value recipients affect the creation of value, the definition of who and what constitutes the 'public' becomes a factor in determining how public value is created. Citizens are for example expected to be co-creators of value while clients are merely provided with a service. The difference in this interpretation of 'value' and 'the public' will therefore affect IT's role in value creation as the incorporation of IT resources might differ in accordance with how value is created and to whom it is intended. There are however similarities between the private and public sector in that they both are situated in uncertainty and an ever emerging environment. (Moore, 1997)

Although the definition of public value differs in research literature there are some factors that are more easily ascertained because of the government context. A focus on competition, that is ever present in the private sector, is a non-issue in the delivery of public value since the government organisation often operates in a state of monopoly by its governing status. However, identifying public value is only a first step. Determining which value is more important to the targeted group is perhaps even more challenging than identifying the public

value in itself. (Jørgensen & Bozeman, 2007) This contrasts with Meynardts (2009) argument that defining the subjective need of citizens becomes the main challenge when creating and delivering public value.

The delivery of public value can be achieved directly or indirectly. Indirectly by internal organisational restructuring to create openness and transparency or by evolving into a more effective organisation that is perceived to have a good level of responsiveness. It can also be delivered directly through interaction with citizens which makes them co-creators of their own public value and therefore directly involved in its delivery (Jørgensen & Bozeman, 2007). The creation and delivery of public value are however bound by contextual restraints that is present in governing agencies (Moore, 1997). It must be in line with policy and law as well as be feasible to implement given the often complex nature of government organisations existing architecture (.ibid).

2.4 Government IT value research

The research centred on IT value and public value shows significant differences between the definitions of private and public and what constitutes value in those two contexts. Even though economic gains from implementing IT resources are seen as beneficial in the public sector (Seltsikas & O’Keefe, 2010) there are other factors that play an important role when it comes to defining public IT value. The strive for governments to improve the conditions of their citizens and improve trust in said government through IT solutions are perceived as more important incentives than economic issues (Cordella & Bonina, 2012; Jackson, 2001; Pang et al., 2014; Tolbert & Mossberger, 2006).

When looking at IT value in the public sector and using a definition designed for the private sector the socio-political impacts are easily overlooked. The public sector, unlike the private values other factors such as the delivery of services, reaching goals set by higher level government, and providing a fair and trustworthy government institution. A private sector model focused on economic gain would therefore be less suitable in capturing these values. (Cordella & Bonina, 2012)

In addition, when observing value within public organisations there are many conflicting interests which can cause negative effects in one area while improvements are made in another area (Cordella & Bonina, 2012; Pang et al., 2014). This is something that IT solutions can mitigate since it can tailor solutions to multiple interests (Pang et al., 2014). Furthermore a higher level of interaction between citizen and government through the IT medium improves efficiency as well as improving the transparency of said government (Kim & Lee, 2012; Welch et al., 2004; Torres et al., 2005; Hui & Hayllar, 2010; Danzinger & Andersen, 2002; Morgeson et al., 2011) Considering the differences between the private and public sector it becomes necessary for a public value perspective of IT solutions when measuring IT value within public organisations (Pang et al., 2014; Cordella & Bonina, 2012).

3. Theoretical framework

As we have shown in our literature review IT value is an extensively studied topic that has been viewed through many different perspectives. However, since there is a difference in the public and private sector that affects how value and IT's role in value creation is perceived it becomes important to define in what context the research is taking place and to look for factors that are relevant in that context. We used the framework of Pang et al. (2014), which describes the connection between IT resources, organisational capabilities and the ability to create public value, as a theoretical lens in our research. By using this framework we structured our research in order to identify the IT value categories that are seen as key factors within the public sector context and avoided looking for aspects that may only be relevant in the private sector (Cordella & Bonina, 2012). This enabled us to gather data that were relevant with regards to IT value in a public sector context.

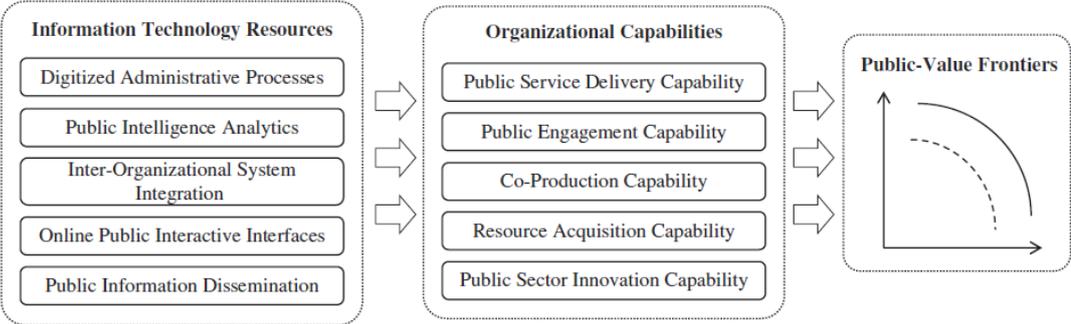


Fig 1: Pang et al. (2014) framework for IT value in the public sector

3.1 IT value in the public sector

As can be seen in fig 1 the framework is divided into three parts: Information technology resources, Organisational capabilities and the Public value frontier. The relationship between these three is summarized well by Pang et al. (2014, p. 188): “we propose that the relationship between IT resources and organisational performance in the public sector is mediated by organisational capabilities”

Pang et al. (2014) defines value creation as the interaction between IT resources and organisational capabilities. This relationship is expanded upon in fig 1 where the Resources and capabilities is further broken down into sub groups that make up the whole. This is however only true for the first two sections while the Organisational performance and the Public value frontier is more of a philosophical perception of improvement (Pang et al., 2014). Below we will further explain the different aspects of each group.

3.2 IT resources

The Information technology resources consists of the *Digitized Administrative Process*, this resource refers to the creation and implementation of systems and infrastructure who can simplify administrative processes. *Public intelligence analytics* refers to the ability to find and process large amounts of data from the public in order to deliver better services. The third IT resource described in the framework is the *Inter-organisational system integration* which is the ability to integrate systems with other organisations as well as the transfer of data between different organisations. This is followed by the *Online public interactive*

interfaces which refers to the ability to interact with citizens through web similar interfaces, such as applications, in a two way communication. The final IT resource described is the *Public information dissemination*. This refers to IT structures that allow citizens to find and take part of public documents as well as, from a government organisational standpoint, the delivery of important information to the public.

3.3 Organisational Capabilities

The first organisational capability is the *Public service delivery capability*. This capability refers to the ability to maximize the government organisations service delivery to the public while using limited resources. IT can help in this regard by introducing time saving or similar functions in order to maximize the delivered service. The *Public engagement capability* refers to a capability to gather the needs of citizens in order to deliver the proper service to them. Without this capability there is a very high risk of delivering services that are not requested and will not be used. *Co-production capability* refers to the ability to use resources from many different sources and make all sources work towards the same goal in order to improve public value. The *Resource acquisition capability* is the ability to find and implement resources from different sources. This can for example be specialists from other levels of government, non-governmental organisations or private firms. If this capability is lacking the public organisation will be left with less than optimal amounts of resources. The final capability is the *Public sector innovation capability*. This capability refers to the ability to understand and adapt to changing circumstances within the society. Preferably new emerging needs is picked up and acted upon early (for example the rise of smartphones).

3.4 Public value

When delivering public value, conflicts are bound to follow about what sector should be prioritised. When looking at the public value frontier it is defined as “the set of maximum multiple public values that is achievable given available resources and the constraints among certain values” (Pang et al., 2014, p. 197). The role of IT within this context is to mediate conflicts that arise within the public sector. IT has the ability to deliver more value with less resources as well as serve multiple purposes at the same time. This allows the public organisation to further the public value frontier through the use of IT.

The basic principle for this framework is therefore that *Information technology resources* enable *organisational capabilities* that in turn allow furthering of the *public value frontier*. The model is not to be understood as “resource X enable capability Y” rather it should be viewed as whole were several resources enable organisational capabilities. It should also be noted that the existence of certain IT resources does not automatically enable certain capabilities to be created, the IT resources should be seen as enabling factors rather than solutions.

4. Methodology

In this chapter we will present our research methodology. It starts with a description of the research case followed by an account of how data was collected and subsequently how it was analysed. Lastly we cover ethical considerations as well as possible limitations in our chosen methodology.

4.1 Case description

The organisation that we visited is a project department working at a strategical level in Skellefteå Municipality, a local government in northern Sweden. Skellefteå municipality has about 72000 citizens and covers 6800 square kilometres. The municipality is organised into several departments with responsibilities such as school, social care and culture. The departments are led by the municipal board (more information can be found in appendix 1). The departments and the municipal board consists of both managers and politicians. The role of the politicians is to decide what actions the municipality should conduct while the role of the managers is to carry out these decisions. This department is situated within the upper management level of the municipality (In appendix 1, Kommunstyrelsen). The role of the employees is, among other tasks to gather information about upcoming projects that the departments wants to conduct. All the personnel at the department is employed directly by the municipality in managerial roles. We choose this particular department because they are specifically working with assessing IT project value. This includes an assessment of IT solutions and gained public value which are areas of concern in this thesis.

Prior to our interviews we visited the project organisation and were allowed to observe their daily meetings and get a better understanding of the organisation in question. Together with Pang et als (2014) framework this visitation helped us in formulating relevant interview questions (Bryman, 2011; Walsham, 1995a).

The choice of conducting a case study were made since it is suitable for studying meaning and subjective perceptions which align with this thesis interpretivist approach. Our interpretivist methodology is grounded in our effort to understand the respondent's point of view and their interpretation of IT value in the public sector. Interpretivism aligns better with the concept of a socially constructed reality than a positivist approach and is therefore more appropriate within a case study that focuses on specific areas of interest that might not necessarily be representative for all cases. The interpretivist approach is also a well-established and used research method within information system research. (Walsham 1995a; Walsham 1995b)

During the case study we conducted interviews with five respondents at Skellefteå Municipality working in the internal project valuation group. Additionally we interviewed two respondents that were contacts from two separate municipal departments that had requested the launch of IT projects. These contacts were responsible for IT related issues at their respective departments. We chose these respondents since their direct involvement in the project prioritization process would yield the most relevant answers in regards to our research question. The fact that we interviewed the majority of the project department also insured that we captured the subjective view from multiple stakeholders in the process.

The data for this thesis was gathered in semi structured interviews (interview questions can be found in appendix 3). We found the semi structured approach to be most suitable

since we could rephrase questions depending on the respondent while still following a set structure that allowed for a better data analysis. Furthermore, the semi structured approach allowed us to ask follow up questions in order to fill any information gaps that the respondent had not discussed (Bryman, 2011). Interviews were conducted with two researchers and one respondent where one researcher was leading the interview. The interviews were conducted at the project department in the Skellefteå municipality offices. The interviews were recorded on our mobile phones and later transcribed.

Conducting the interviews at the project department allowed the respondents to relax and be more comfortable in the interview process since they might be more at home in their daily environment than they would have been in another location. It also caused a minor inconvenience in their regular work process because of the limited time that was needed to conduct the interviews. Ensuring these conditions in the interviews process can enhance the collected data that otherwise might be compromised by the respondent's state of mind. (Bryman, 2011)

4.2 Data analysis

The data analysis consisted of two cycles of coding. Initially the transcribed interviews were read in order to get an overview of the data and an initial impression of their content. This was followed by qualitative content analysis (Bryman, 2011) where relevant quotes and statements were highlighted and inserted into a table. Each statement in the table were then summarized in a shortened version based on what the statement was addressing. The shortened versions were then given a code which were then categorized based on the categories in Pang et al. (2014) framework that acted as a support structure in the data analysis, an example of this can be seen in table 1.

The second cycle of coding consisted of identifying trends, patterns and relationships in the data. We first attempted to find the most common themes in the data by grouping them to their specific category. Sometimes the data referred to two or more categories at once. We therefore looked at what categories were often mentioned together in order to identify patterns. The use of a deductive approach in the data analysis helped in identifying relevant answers that could be linked to government IT valuation. However, as is the case with qualitative content analysis we remained open to the introduction of new categories if it was deemed necessary during the analysis (Bryman, 2011).

Sentence	Condensed sentence	Code	Category
We thought they would want a service that provided info about past time activities but it turned out they wanted something to make sense of their school day.	Planned a service for past time, they wanted a service for school time.	Understanding the customer	Public intelligence analytics
As it is today we have over 400 IT systems in the municipality and 54 issue tracking systems, is that really necessary? Could you consider that those 54 would be cut in half? It is essentially the same types of functions. We have 8 booking systems, why?	400 IT systems, 54 issue tracking systems, 8 booking systems, why? Consists almost of the same functions.	Many systems	Inter-Organisational system integration

Table 1: Examples of categorized data

4.3 Ethical considerations

When interviewing individuals about their workplace, sensitive information can sometimes emerge. This can create tensions and ethical issues that we as researchers must consider in our study (Walsham, 2006). In this thesis we choose not to include names of respondents or use any type of pseudonym since it would not contribute to the result. We have also chosen to change any name of other reference that may disclose the respondent's identity. Furthermore all participants were informed of the research purpose and of their right to leave the interview at any time. They were also informed that our data would not be used in any other context than in this thesis. Despite our efforts of anonymity and confidentiality the possibility remain that participants within the project organisation or investigating researchers might identify respondents based on the information that is given in the thesis. There is a balance between providing enough information in order to clarify the study's context and withholding organisational information in order to prevent the discovery of involved participants (Walsham, 2006). This is also in accordance with the regulations and guidelines from Vetenskapsrådet (2002).

4.4 Methodological Limitations

The use of a case study is often criticised because the results is not easily generalized between different cases. This is however not an issue since the case study results will contribute to research theory. (Yin, 1994) It is not supposed to be viewed as a definite answer that can represent every context.

We recorded the interviews which might have had an impact on respondents as well since their awareness of being recorded might have caused them to withhold information (Bryman,

2011). We are however more interested in the bigger picture rather than specific details about this particular organisation. We therefore argue that the eventual lack of certain details does not have any significant impact on our research. In order to minimize the risk of losing data because of recording devices we used our mobile phones as they could be perceived as less intimidating due to their natural occurrence in the respondents' daily lives.

One further limitation was the two respondents that were not part of the project department. These individuals were found through a snowball selection and they may therefore not have been the ideal representatives of this group (Bryman, 2011). However, they represented a different point of view on the research subject that we felt gave credence to their inclusion in the study.

Because of the interpretive nature of qualitative research there were also always a risk of interpretive bias since we have our own background and opinions. The analysis of data is basically an interpretation of another person's interpretation of a phenomenon. That in turn can be shaped by the interpretation when using theoretical framing in the research. (Bryman, 2011)

5. Results

This chapter is split into four major topics, the first describing our initial visit to the project department and the following three in accordance with the structure of our theoretical lens. The three sections highlight our findings with regards to the respondents' views and how that translates to IT resources, organisational capabilities and public value frontiers. These three sections will be divided into eleven subtopics, based on the structure of Pang et al. (2014) framework and presents our findings in each section. All citations in this chapter have been provided in Swedish and translated at a later stage.

5.1 Initial visit

During our initial visit to the project department we were informed by staff at Skellefteå municipality how the initial project phase is organised. We participated in initial project meetings, were given a presentation how the department works and were allowed ask questions to people involved in the project process (but were not among our respondents).

When any department within the municipality wants to conduct an IT project it first has to be approved by the project department. A department representative holds a meeting with a project department representative where they describe their desired project. The project then gets an initial assessment based on several criteria such as risk, added citizen benefit and cost of the project (the framework for criteria and risk assessment can be found in appendix 2). The scope of the project can differ from projects spanning over years to projects that will be done in a day. After this meeting the project will go through a prioritization phase where all the projects in the municipality will be assessed and placed on a list. Projects that get a placement of 40 or higher will be assigned a project leader and the project will then, if it remains relevant, commence. During our visit the list consisted of about 200 projects.

5.2 IT Resources

5.2.1 Digitized administrative processes

When discussing administrative processes our respondents acknowledged that the majority of projects within the municipality were focused on internal administration. It was recognised that projects which Digitized administrative processes added value to the organisation, mainly by reducing the workload of government employees. Two respondents argued that when constructing administrative systems that had the citizen as the end user, such as a digital application for a municipality service, automation of the whole organisational process was still important. A system that had a simple user interface towards the citizen but required a lot of manual work within the organisation was seen as less valuable:

There are municipalities that makes it nice and easy for the citizens, but then gets a ton of work inside the organisation instead. Okay, it should look nice and be easy to use for the citizens, but also always lead to increased internal efficiency

5.2.2 Public intelligence analytics

Three of the seven respondents directly discussed the need to register citizen opinions and interaction with the government. This was considered valuable in order to design and deliver new services in accordance with citizen needs and to stay updated on citizen behaviour when they interact with the municipality. One respondent phrased this as follows:

How can we present statistics wheather there are seven children or 27 children or 13 boys or 14 girls [using a government service], whatever is the case. That is what we aim to achieve

Two of the respondents made the point that when allowed to guess most people, whether working within the municipality or not, did not know what the most requested service from the municipality was. An increased knowledge of citizen needs enabled by integrating IT solutions were perceived as valuable for the municipality and something to strive towards. According to the respondents the municipality often does not understand what citizens actually wants which could result in IT services that were ill fit for its designed purpose.

5.2.3 Inter-organisational system integration

Five of the respondents argued that the plethora of systems that operated within the municipality was a negative factor. It was expressed that the systems had poor integration with each other and that it required additional manual work in order to perform tasks within the municipality. Legacy systems also cause difficulties in determining the plausibility to implement new IT solutions because of the lack of knowledge of the existing infrastructure. “They cannot assess if it [the IT solution] fits with our current architecture because they cannot see the entirety of it”

The respondents seemed to agree that the current state of legacy systems was something that preferably should be replaced by one larger system or be moved into a cloud service sometime in the future. As an example one respondent questioned whether the 54 case systems that currently are in use in the municipality really are necessary or if that number could be cut in half. It were however noted that combining all the systems into one might be a utopian idea that never will be achieved. A reduction of the current number of systems were however desired.

5.2.4 Online public interactive interfaces

The implementation and design of online interfaces was emphasised as very valuable to citizens. One respondent argued that the municipality's goal was that the majority of interaction with the municipality should be done online. When assessing public value, online interfaces directed towards the citizens was perceived to add more value than internal improvements within the organisation. The benefits which were identified were that online services could simplify the citizens' interaction with the government and speed up their process of gaining government information. One respondent went as far as to say that "the benefit to the citizen is basically the ability to interact with the government without having to meet a single person".

There were however some concerns regarding the many IT systems that currently exist and the will to provide a unified interface towards the citizens. Multiple interfaces were perceived to have a negative effect on the created citizen benefit because of the inconvenience that citizens would experience when trying to find government information.

5.2.5 Public information dissemination

Five respondents mentioned the importance of sharing public information with the municipality's citizens. Exactly how important different types of information were seemed harder to assess. The respondents implied that the information value differed depending on who you asked. One example that arose in the interviews was centred on a municipality service that delivers a text message which informed the recipient that the cross country ski trail was prepared. The respondent questioned whether it can be classified as valuable because of the limited number of people that received the service:

I know that it is extremely appreciated when you [citizen] get a text message saying that the ski trails are prepared. But how important is that? I know that there are eight to nine hundred people that use the ski trails that thinks it is important

The information in question that the respondents referred to when discussing information dissemination were of simple nature and ranged from knowing what food was served in the school cafeteria to information about opening hours at government facilities. One identified problem was how to distribute information in such a way that it created value to the citizens. It was recognized that the municipality had to find better ways to distribute information by using applications or online interfaces, "the value is within the application" as one respondent put it.

5.3 Organisational Capabilities

5.3.1 Public Service Delivery Capability

Regarding the municipal service delivery there was a general agreement among the respondents that services always have to improve something for the “customer”. The customer was defined as “the citizen”, or as “citizens, businesses and associations” within the municipality. Services that were viewed as valuable were those that simplified tasks or enabled the citizen to perform new tasks via the IT medium:

Customer benefit (swe. Kundnytta), it means that it should simplify things for our customers. With that I mean our citizens, businesses and associations that makes use of our services

One respondent described the government service responsibility as the ability to create a simpler everyday life for everyone living in the municipality. This would be achieved by creating an open government that supports innovation and participation from the citizens. It also included producing higher quality services that were enabled by an effective internal organisation. One respondent further argued that the created value did not lie in the IT artefact itself, but in the ability for citizens to perform tasks in a new and more efficient way:

The IT project does not really add value to the municipality at all, and it does not give any value to the municipality citizen. The thing that adds value to the municipality citizen is the changed work operation.

5.3.2 Public engagement capability

Four of the respondents expressed the need for the municipality to know what the citizens desired and perceived as valuable. It was also admitted that without quantifiable data about citizens’ interaction with the municipality they did not have the required knowledge to deliver relevant services to their citizens. The municipality had previously started logging what their citizens were contacting them about and the respondents saw a great value in this type of data collection. The respondents argued that the data collection enables the municipality to design online interfaces and services with the citizens needs in mind:

When we started registering the questions that came in [via customer call centre], we got to know what questions the citizens actually asks. Because we really did not know, it was only guesswork. Which meant that we were sketching on online services without really knowing what kind of online services that were requested.

In addition, the respondents saw a need to interact with the citizens in order to understand their needs. According to one respondent interaction with the citizens could be improved through technological solutions which in turn would create value to the citizens. This required implementation of online interfaces that the citizens could use directly to communicate with the municipality organisation:

Value to citizens really is online governance. To easily, with the help of handheld devices, smartphones or the computer, interact with the municipality and conduct classical municipal processes

5.3.3 Co Production capability

Two respondents highlighted that each government department had their own line of work and did not cooperate much with other departments. They did however admit that there was a need to develop this capability, to work more agile and in cooperation with other departments or even private firms in some cases, in order to assess what should be done within the organisation to add as much value as possible to the citizens. One respondent also mentioned the need for increased and earlier cooperation with the IT department when developing new IT services in order to find the most optimal IT solution for each IT project. Another respondent did however state that there is no need for external involvement by someone from the IT department in every project and expressed the opinion that there should be different routines depending on the project scope.

Every respondent also mentioned that prioritisation of projects would have to be a collaborative effort by all departments in order for a just allocation of resources, but also in order to create a better understanding of the prioritization process within the whole municipality. As expressed in this quote:

We will hand this over to our CIO, he will have a group of representatives from every municipal department, as well as people from the municipal manager office and support and facilities in order to make decisions for the whole municipality

5.3.4 Resource acquisition capability

Finding resources was something that proved difficult within the municipality. It was mentioned that acquiring additional money to the government organisation only helped to some extent. Hiring external consultants for example came with its own set of problems since these would not possess the legacy system knowledge that was needed. A bottleneck was rather the limited number of senior IT architects within the government. One respondent described that the lack of resources created frustrations since important projects were put on hold because there simply were no human resources available even though project money was allocated. Furthermore it was mentioned that external resources sometimes existed in order for the municipality to improve their IT systems but that there was a lack of knowledge as to how to integrate the provided resource in the daily work routine:

It all boils down to that even though we pour in money in the form of resources, there is always one key person who have to be involved in everything. (...) And they cannot work 24/7, their work needs to be planned so that they to have a liveable existence.

Information gathering of citizen needs were considered valuable in assessing which kind of resources that were required, however that did not help in the actual acquisition of said resources. So even though the respondents knew what was needed they acknowledged that

they were probably not going to be able to gain access to these solutions or to the required knowledgeable individuals.

5.3.5 Public sector innovation capability

Regarding the innovation capability there seemed to be two separate opinions. The first was that a good overall IT strategy would stimulate innovation in every government department while still aligning with the IT strategy of the whole government organisation. The second were that notable frustration emerged with such strategies. Mainly the fact that it created unnecessary bureaucracy that slowed down the innovation process. Two respondents argued that the added bureaucracy may cause individual departments to disregard the overarching IT strategy in order to achieve the desired department changes without going through the IT project process. This was done because they argued that it was more important to be able to deliver quality services to the citizens than to follow procedural protocols within the municipality:

It is not like the work ceases because the IT department is slow. And then solutions are created. (...) We cannot stop operations, because our surroundings are moving forward pretty fast

5.4 Public value frontiers

5.4.1 Public value

Regarding the aspect of public value the word “customer benefit” (swe: Kundnytta) surfaced several times as the most important factor when understanding IT value. All of the respondents clearly stated that IT projects that directly affect the citizens have priority over internal IT projects that have no interaction with the citizen. However, the respondents acknowledged that even though indirect improvements was not perceived as valuable as direct improvement to citizen services, IT projects focused on organisational improvements could provide secondary public value through a more efficient organisation. In addition one respondent theorized that projects which targets school, healthcare or care services would be prioritized higher because of their political status. There were also issues raised regarding bias towards your own profession or focus of interest when determining value. This was because of the experience and knowledge that the individual has gained when working within those areas of concern in the past:

You assess [IT projects] with your own perspective, or based on what you yourself think is important and your own experiences. Of course the prioritization could be different depending on who conducts it.

The respondents seldom discussed IT value in terms of frontiers were an IT solution can improve multiple aspects in the government context and therefore create Public value on multiple fronts. There were however some quotes that touched on the subject. Two respondents argued that improved internal administrative procedures could lead to a secondary benefit of cost reductions. Both benefits were tied to citizen benefits since an

effective organisation can enhance the provided services as well as reduce the spending of taxpayer money:

If you replace an IT support and if you redo the work process, then you can save a lot of money in the municipality. Then we say that it is secondary citizen benefit. Because it affects the tax revenue indirectly if we can keep costs down by an effective way of working in the municipality. We value both the indirect citizen benefit and the direct citizen benefit in the form of smarter services, more appealing services, simpler services.

5.5 Patterns

The second cycle of data analysis revealed two distinct connections between IT resources and Organisational capabilities. One such connection were between *Public intelligence analytics* and *Public engagement capability*. The need to understand citizens and involve them in the process of designing new systems were interconnected in our data. The respondents repeatedly argued that understanding the behaviour of the municipality citizens and what they actually need is essential in order to design new services that create public value. Registering data from a large portion of the citizens' interaction with the municipality were perceived to provide a richer image of citizens needs since individuals seldom have the complete picture of what is requested.

The second connection were between *Online public interactive interfaces* and *Public service Delivery capability*. These online interfaces were mentioned as a good practical solution to deliver public services. In order to deliver services to the citizens', online interfaces were considered the most valuable since they affected the citizens directly. Applications and websites that have the citizens as end users are perceived to be more easily assessed based on the citizen satisfaction. The respondents argued that it was perceived as easier to judge if the citizens actually received any benefits from such IT solutions rather than by secondary benefits produced by internal organisational improvements. This line of thinking was something that the respondents acknowledged was implemented quite well within the municipality: "We are working a lot with e-services, and that you should be able to do things through your mobile or via the web, and in that regard we have gotten quite far".

In addition, there were also two identified connections between Public service delivery capability as well as Public engagement capability and Public value. Providing services and creating new services that addresses citizen needs were considered very important and the primary function of the municipality: "What is best for the client [citizen] is if there is something that they have not been able to receive earlier, that you can establish new services"

There were however a distinction between delivering services that directly affects the citizens and improving internal organisational processes that in turn can improve services provided to the citizens. Delivering services that is directly used by the citizens were always perceived as more valuable:

...maybe they will realise that, alright, my small server request might not be that important in this context, when X hundreds of teachers need support [IT support] before the schools starts again in the autumn.

Regarding Public engagement capabilities connection to public value the respondents viewed input from the citizens as essential in the creation of value. This was in large parts achieved by gathering data of citizen interaction with the municipality. Designing new services without considering citizen needs were considered a waste of time and resources. A perspective that was summarised by one respondent:

A citizen perspective, we should listen to our citizens. We should take their perspective when we create new things. Not just what we who work in the municipality think is good.

In order to improve this ability one respondent envisioned direct citizen integration in the project process by inviting citizens to interact directly with involved actors in the project process. However, this was not considered feasible in the current project process but something to strive towards in the future.

6. Discussion

6.1 Citizen oriented IT value

During our study the respondents showed a certain distance towards specific IT solutions. Specific systems were rarely mentioned by our respondents and always in passing if they were mentioned at all. There seemed to be a view among our respondents that the specific IT solution were not important to the overall value delivery process. As long as the IT solution delivered the requested service the nature of it was not important, IT value did not emanate from IT in itself. IT was perceived as a background support that were just supposed to be there.

The respondents did however identify the creation of citizen benefits as the main objective of IT solutions, thus the created IT value depends on the provided services and the fulfilment of citizen needs. Because of this it was seen as vital to know what the citizens wanted in order to deliver value through IT projects, which is something that aligns with Meynardts (2009) conclusions regarding value creation to citizens. This could consist of gathering big data as well as directly asking citizens what they actually wanted. The customer support which logged every issue the municipality was contacted about were seen as very valuable when assessing IT solutions since the statistics from customer support could be analysed and services that simplified these requests could be created. This focus on public intelligence ties in well with the perception that IT value emerges from the citizen benefits that the IT solution creates. The respondents further argued that IT solutions which are directly used by the citizens were more valuable than internal IT solutions that the citizens might not notice in their daily lives.

In practice the framework of Pang et al. (2014) seemed to be reversed when selecting between different IT solutions. The respondents start by looking at what public value frontier is affected by a certain IT project. After that the respondents examine what organisational capabilities may be needed in the creation of the identified public value. Finally they will consider what types of IT solutions may enable these capabilities.

Only focusing on public value may lead to the production of even more systems within the organisation since the main focus is on the delivered public value rather than system

integration. This is a common problem within municipalities (Moore, 1997) and brought up as a concern by our respondents. The current project process have a short risk assessment that includes questions regarding the IT solutions possible integration with legacy systems. However, by only focusing on the potential citizen benefits and by not identifying the IT solution the assessment becomes useless. How can you assess the implementation of an IT solution that is undefined?

When analysing the interview data it became increasingly clear that IT resources were viewed as unimportant and something that should not be the primary focus in IT value assessment. However, when looking deeper into the material there seems to be strong opinions on different IT resources connection to public value. An example being the value of IT solutions registering citizen habits when contacting the municipality. The respondents might not realize it themselves, but they clearly have an opinion on which kind of IT resources that creates the most public value. Every respondent perceived IT resources that were used directly by the citizens as more valuable than IT resources that were used by the internal organisation. We argue that IT resources therefore should be viewed as a factor with more importance in the IT value assessment than it currently is. Not focusing on IT resources may have detrimental effects in the same way that only focusing on IT resources may have a detrimental effect on the implementation outcome.

6.2 New connections between IT resources and Organisational capabilities

The Digitized administrative processes were viewed upon as something of secondary nature. Our respondents often stated that the services with direct effect on the citizens was always more important than improving the internal organisation. This also ties in well with Layne & Lee (2001) and Jackson (2001) who argued for the importance of providing value for citizens rather than creating an effective internal organisation. It does however contrast with the statements of Pang et al. (2014), that improving administrative processes together with Public intelligence analytics will affect Public service delivery the most. Our study showed that online public interfaces were regarded as the most important factor for Public service delivery which is also indicated by Torres et al. (2005). Regarding the statements of Pang et al. (2014) that Public intelligence analytics increase Public service delivery we saw no such connections in our study. Rather we would suggest that Public intelligence analytics mostly improve Innovation capability and that Innovation capability in turn would improve Public service delivery.

When discussing Public engagement capability the respondents emphasised Public intelligence analytics as the most important factor since it showed what the citizens actually wanted from the municipality. Online public interfaces might assist in this if they are designed to allow citizens to report on what they want from the municipality. However, a subjective view might differ from what the majority actually wants so it is not perceived as important as Public intelligence analytics when trying to co-create services. This result differs from Pang et al. (2014) proposition that Online public interfaces are the IT resources that has the strongest connection with Public engagement capability. We argue that Pang et al. (2014)

have a narrow view of what Online public interfaces are capable of since many services can be delivered through online interfaces, something that was viewed as the most valuable capability of these interfaces in our study. Furthermore we would argue that large scale data gathering such as the customer service system in our study provides a richer understanding of citizen needs than the submission of subjective views through online interfaces which is also confirmed by Hui & Hayllar (2010). While we acknowledge that Online public interfaces can increase the Public engagement capability we argue that it is not the main role of Online public interfaces since these interfaces mainly provides services to citizens.

The Public innovation capability was in turn the factor that we saw as not only being viewed as unimportant but also a capability that was directly undermined by the organisation. The perceived important Public intelligence analytics enable the municipality to assess the citizens' needs which could aid the creation of innovative IT solutions, something that Pang et al. (2014) also concluded in their research. However, the respondents stated that many smaller initiatives had to be cancelled since it did not fit into the bigger picture of the software systems. In addition to this the initiatives for organisational development only came from the departments themselves. This may hinder getting an outside perspective and observe new possible structures or solutions rather than focusing on incremental upgrades to the current structure. In contrast to Pang et al. (2014) we argue that the connection between the Public intelligence analytics, Information dissemination and Public sector innovation capability is not as straightforward. The identification of citizen need and the ability to identify a solution (innovation) to that need involves a longer innovation process that is supported by Public intelligence analytics. However, it also requires additional assets in order to be successful. From our study we conclude that the Co-production capability would further support the Innovation capability by harnessing resources from several involved participants, something our respondents often emphasised.

6.3 Difficulties in assessing public values against each other

The difficulties in determining what defines IT value makes this case study an interesting viewpoint into how it is perceived in a practical setting. The collected data in Skellefteå municipality indicate a strong connection between IT value and citizen benefits. When assessing IT value there was strong consensus that the main priority was that the IT solution created benefits to the citizen in Skellefteå municipality. So far the results confirms previous research into public sector IT value (Cordella & Bonina, 2012; Pang et al., 2014) while it differs with the economical focus that exists in the private sector (Kohli & Grover, 2008; Im et al., 2001; Khallaf, 2012; Rai et al., 1996).

However, as previously stated the IT solution was perceived as unimportant when the respondents discussed IT projects public value potential. The focus were on the delivered service and which citizen group that were affected by the process. The respondents indicated that the assessment of created public value and its importance was based on personal preference and the subjective background of the individual conducting the assessment and their relation to the affected citizen group in question. One respondent acknowledged that the decision might be made based on political underpinnings that dictate that school, care services and healthcare are more important than other municipal responsibilities.

When asked directly to assess IT value in solutions aimed at different groups of citizens the respondents were also in agreement that the IT solution should be valued differently depending on the group of citizens. However, the answers differed regarding which group of citizens were more important and the respondents acknowledged that it was a very difficult question to answer, even more so than defining the value in itself, which differs from Meynardts (2009) conclusions while confirming Jørgensen & Bozemans (2007) research that draws the same conclusions. This also indicates that individual perception of citizen group importance in the municipality are of higher importance than the suggested IT resource. An example would be to try and assess the IT value in a solution targeted to school children compared to the IT value in a solution targeting the elderly. One must first assess which IT solution creates more value and then factor in to whom the value is created.

This line of thinking leads to a contrasting dilemma when assessing IT value. The respondents themselves argued that direct citizen benefits such as services from Online public interfaces were more important than secondary benefits gained through internal organisational improvements. This is directly contradicted by judging the IT value based on the affected citizen group. An example would be to assess the greater public value in an Online public interface resource directed to a handful of people that use it to shop groceries or in increased organisational efficiency that in the long run might improve the living standards of elderly's in municipal housing.

These findings regarding the difficulties in assessing the importance of a created public value highlight an aspect in government IT value research that is understudied in previous research which often focuses on the definition of public value, the connection to IT value and how value is created (see Meynardt, 2009; Moore, 1997; Hartley, 2005; Tolbert & Mossberger, 2006; Seltsikas & O'Keefe, 2010; Cordella & Bonina, 2012; Pang et al., 2014; Kim & Lee, 2012; Welch et al., 2004; Danzinger & Andersen, 2002; Morgeson et al., 2011).

The fact that public value importance is based on personal preference gained from previous experience and not the IT resource undermines the idea of an objective assessment of IT value. We argue that it makes the valuation process of IT projects a result of who best argues that their perceived public value is the most important or who can be the most vocal of their opinion. Which is precisely what the project group in Skellefteå municipality wanted to avoid.

7. Conclusions and suggestions for future research

There is an ongoing debate as to what value can be derived from the implementation of IT in the public sector. Our research address this issue and shows a local government's perception of IT value and what role IT has in public value creation. From our study we can conclude that IT value in the public sector context is perceived as the IT solutions ability to create internal or external processes or services that creates benefits to the municipal citizens. Citizen benefits can include improved access to government information or secondary benefits in the form of a more effective municipal organisation. A valuable revelation was that there was a notable disinterest in specific IT solutions because of the belief that IT value is

not created by the IT solution in itself. The created public values importance was instead indicated to be based on personal experiences and the targeted citizen group.

Despite this the respondents argued that the ability to deliver governmental services through public online interfaces such as webpages or mobile applications created the highest public value since they are directly used by the citizens. The IT value gained from an improved internal organisation, while perceived as positive, was not valued as highly because it might not change the everyday lives of citizens in a noticeable way. This creates a conflict between judging IT value based on direct or indirect effect by the IT solution or by the perceived importance of the targeted citizen group. Another valuable contribution is that the identification of which public value is more important when targeting two different citizen groups was perceived as more difficult than determining what the created value actually consists of. This is an aspect of Government IT value that is understudied and requires additional research in order to enable better assessments of created public value.

Finally, the use of Pang et als. (2014) framework in a case setting revealed that the Online public interfaces were the IT resource that was perceived to have the strongest connection to improved Service delivery capability due to its direct connection with the citizens. Public intelligence analytics was in turn essential in order to improve the Public engagement capability since it enables the municipality to create new services with the citizens need as a focal point. These results contrasts with the conclusions of Pang et al. (2014) in that Online public interfaces directly affects the Service delivery capability instead of the Public intelligence analytics that we argue instead improves the Public innovation capability, which in turn can improve the Public service delivery capability.

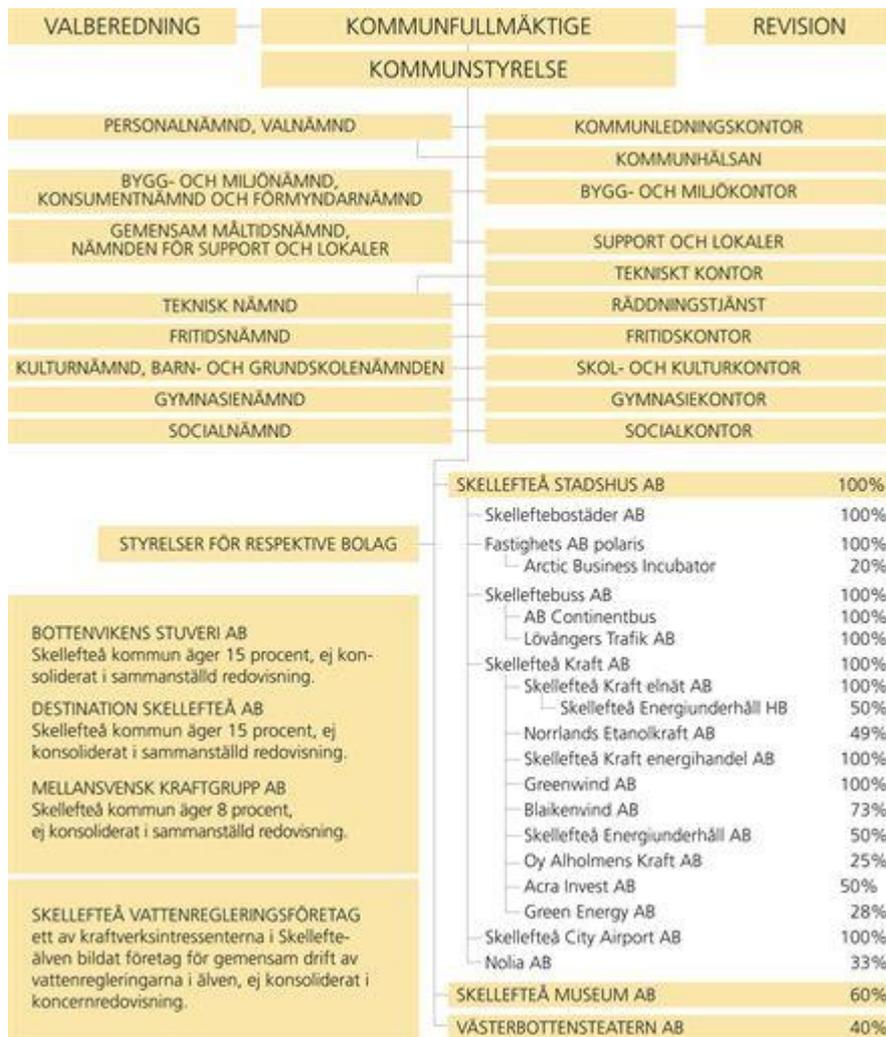
Further research may want to explore if additional public organisations also prioritize IT solutions in this manner and what impact the focus on citizen benefits, rather than possible IT solutions, may have on IT value perception. During this study, indications of social construction of IT value were apparent, however because of time constraints and the focus of the study this could not be analysed to its fullest extent and might yield interesting results in future research.

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Appendix 1



Riskbedömning

Risker	Nummer		Risk-område
	Kategori	Svar Vet ej = Ja	
Vilka avdelningar/enheter/anställda berörs av förändringen?	Ohälsa	Hela kommunen	
Innebär förändringen att en stor del av personalen måste ändra eller byta arbetsuppgifter?	Ohälsa	Nej	
Kan förändringen leda till att nya arbetslag/arbetsgrupper skapas?	Ohälsa	Nej	
Kommer chefer/cheferna att behöva arbeta aktivt med förändringsledning?	Ohälsa	Nej	
Saknas en plan för hur medarbetarna ska göras delaktiga i förändringen?	Ohälsa	Ja	x
Saknas en plan för hur man ska kommunicera förändringen?	Ohälsa	Ja	x
Saknas en processkartläggning?	Arbetsätt	Ja	x
Saknas synpunkter från slutkunden, invånare/medarbetare?	Arbetsätt	Ja	x
Innehåller systemet integrationer?	Integration	Ja	x
Går integrationerna direkt mellan systemen (inte via Teis integrationsmotor)?	Integration	Nej	
Vilka integrationer finns?	Integration		
Har systemet en koppling till AD (active directory)?	Integration	Nej	
Kommer sekretessbelagda uppgifter enligt sekretesslagen att beröras av förändringen?	Juridik	Ja	x
Kommer personuppgifter enligt PUL att beröras av förändringen?	Juridik	Ja	x
Kommer känsliga personuppgifter enligt PUL att beröras av förändringen?	Juridik	Ja	x
Har systemet en ut- eller inbetalningsfunktion, hantering av pengar?	Säkerhet	Nej	
Behöver systemets information arkiveras?	Säkerhet	Nej	
Behöver systemet administratörsbehörigheter?	Säkerhet	Ja	x
Har systemet single sign on?	Säkerhet	Nej	
Har systemet mer än 50 användare?	Teknik	Nej	
Är det en molntjänst?	Teknik	Nej	
Finns det nån del av systemet som ska ligga utanför brandväggen?	Teknik	Nej	
Finns det mer än en typ av klient (dator, webb, mobil, platta)?	Teknik	Nej	
Innehåller systemet en databas?	Teknik	Ja	x
Har systemet en annan databas än MS-SQL?	Teknik	Nej	
Behöver systemet vara tillgängligt utanför kontorstid?	Teknik	Ja	x
Är längsta tillåtna stilleståndstid två dagar?	Teknik	Nej	

	Allvarlig risknivå
	Betydande
	Måttlig
	Försumbar

Celler märkta med rosa bedöms ha en större risk och höjjer risknivån

Appendix 3

Initial questions

How would you describe your daily work routine?

Could you describe your working background?

Could you describe your general IT interest?

IT Value questions

How big of a role does the IT-solution have in your prioritization of IT-projects?

What technological resources do you feel are important in order to create value for citizens?

What technological resources do you feel are important in order to create value for the government organization?

How does the evaluation process of IT-systems that are directly linked to citizens take form compared to the evaluation of IT-systems that work in the background within the government organization?

How do you assess technical capacity or technical demands when evaluating an IT-project?

IT-project value questions

What do you feel characterizes value in IT-projects?

What do you feel characterizes lower value in IT-projects?

What do you consider the most important factor in determining value in an IT-project?

What difference, if any, do you perceive when evaluating internal or external projects?

I.e. projects focused on citizens or projects focused on employees within the government organization.

Public value questions

How would you describe Skellefteås overarching IT-strategy?

How would you define public value?

Do you believe that public value can be interpreted differently between different government actors? If yes, in what way and what effects might that have?

What do you believe constitutes value in the eyes of your citizens?

What organizational capabilities do you feel are important in order to create value to your citizens?

External evaluation questions

How well do you feel your client project meetings enable you to understand the needs of your clients organization?

If you could rework the client project meetings in any way, what would you change?

Could you describe any strengths or weaknesses with your public value analysis?

Could you describe any strengths or weaknesses with your risk analysis?

If you compare your work with your earlier project management process, what effects do you notice with your new organization?

What do you consider the greatest strength and weakness in your current project process organization?

What strengths and weaknesses do you feel that external assessments of projects entail?