

## A Case Study of Four IT Companies Developing Usable Public Digital Self-Service Solutions

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**Abstract**— This paper presents a case study of implementing a user-centred approach in four software companies that, by supporting the development process, provide the municipalities with various self-service solutions for their citizens. This study outlines the process of how four companies develop their solution, including their customer involvement, end-user involvement, and product. The findings are compared to the number of usability problems identified in the four self-service applications developed by the software companies. This shows a mismatch between the usability and utility in these four solutions.

**Keywords**— Case Study; Self-Service Applications; Usability; Utility; Development Process; User-Centred

### I. INTRODUCTION

European countries are currently developing digital self-service solutions for their citizens. These efforts are being launched to improve citizens' services and to reduce costs [18]. Though public self-services have been on the agenda in many countries for years, getting the end-users to use these applications is not easily achieved. For citizens to accept public digital services and websites, these sites need to have a high degree of usability [11]. Wangpipatwong et al. found that public digital websites in Thailand are lacking usability due to poor design and non-employment of user-centred design methodologies [7]. Several countries like United States, United Kingdom, South Africa and Denmark have developed guidelines to ensure the development of more usable public digital applications and websites [2][3][14].

The Digital Economy and Society Index (DESI) describes the level of digitalisation of the countries in EU. This is measured in five areas, including digital public services [18]. The total degree of digitalisation varies, from Romania, Bulgaria and Greece at the bottom to Sweden, Finland, and Denmark at the top [18]. Denmark is one of the top 3 countries in regards to all other digitalisation areas in EU and is one of the leading countries in the world [18].

Denmark has a population of 5.6 million people and is divided into 98 municipalities as a single point of contact for citizens in regards to the public sector [7]. In 2012, a digitalisation process was launched with the goal that, by the end of 2015, 80% of forms completed by citizens to the municipalities are filled in and submitted digitally [1]. Until 2012, a contract based approach was used for digital public services, where the software companies competed by bidding to an offer. Since 2012, the individual municipalities have been able to choose between competing designs for each

digitalisation area. Denmark has created guidelines to ensure that public digital self-service applications and websites are usable for the citizens [1].

This paper presents a case study of four competitors implementing usable digital self-service solutions for the same application area. We have focused on analysing the customer and user involvement during the software development process, and the characteristics of the 4 products developed and results of usability evaluations thereof. Section 2 presents the related work. In Section 3, the method of this case study is presented. Section 4 presents the results, and, finally, Section 5 presents the discussion and conclusion.

### II. RELATED WORK

Studies show that quality and cost are complementary, e.g. [8][9]. But from the self-service providers' point of view, focus on usability will increase the price of the product, making the developed solution harder to sell [15]. This means that, to get public self-service providers to get this focus, usability has to be made a requirement. Both Jokela et. al. [13] and Mastrangelo [21] describe the importance of usability being specified in the requirements specification document. Mastrangelo describes that public administration needs guidelines to help getting usability placed in the requirements to get the intended impact [21].

There is a disagreement in the related work in regards to what is the best approach. Jokela et. al. found that to acquire usable digital self-service solutions the specified usability requirements have to be performance-based, as only these types of requirements would be verifiable, valid and comprehensive [15]. Additionally, the usability of digital self-service solutions should be validated before the solutions are sold to the municipalities [15].

This does not correspond with what Tarkkanen et. al. found. Formal and detailed criteria for validation will cause usability workarounds by the self-service providers as they will focus only on the verification of their application in regards to the requirements, instead of focusing on getting the usability of the digital self-service solutions validated and finding and fixing usability issues [16].

### III. METHOD

This study was conducted as a multi-case study [5][22] analysing four competitors implementing usable digital self-service solutions for the same application area. Next, the four

cases are presented and the data collection and analysis are described in more detail.

A. The Cases

Below, the four companies are described. The organisations have developed similar solutions and are competitors in regard to the 98 municipalities in Denmark who are the potential customers. To find the differences between these companies as much as possible, we created the scale shown in Table I.

TABLE I. CATEGORISATION OF THE FOUR ORGANISATIONS AND SOLUTIONS

	Immature company	Mature organisations
New self-service solution	Case A	Case B
Optimisation of existing self-service solution	Case C Case D	

Table I shows the placement of the four cases in regards to maturity and if the digital self-service solution is new or an optimisation of an existing solution. This shows the placement of the four cases in regards to maturity and if the digital self-service solution is new or an optimisation of an existing. The organisations' maturity has been defined according to their experience developing digital self-service applications in general.

The SME scale (small and medium scale enterprise) [20] has been used in regards to number of employees and turnover, to categorise the size of the four companies involved in this case study.

This area of self-service applications was chosen as the application had a certain level of complexity. The four companies were chosen because they were the only companies developing this specific solution, and the companies and their developed self-service solutions were different in terms of maturity of the company and if the company was developing a new solution or was optimising an existing solution.

Case A is a micro/small organisation in regards to the SME scale and the turnover and number of employees. The organisation has not previously developed other public digital self-service solutions, so it is categorised as immature. They use SCRUM [27] as development method and their digital self-service solution is categorised as new for the same reason. This company is an independent consulting and software company.

Case B is a large organisation in regards to the SME scale. The organisation is categorised as mature in regards to digital self-service solutions in general as they have developed several public digital self-service solutions previously. They use SCRUM as development method and PRINCE2 [28] as project management method. This specific solution is categorised as new, though they already have an existing solution, as they redid both the analysis and design phase, before developing this solution. This company has departments all over Scandinavia and creates and sells software solutions to several different markets.

Case C is a large organisation on the SME scale. They use their own development method, mainly staged but sometimes with agile elements. The organisation is described as both immature and mature in regards to digital self-service solutions. In general, this area of application is fairly new to them. They have an existing solution in this self-service area. This company has departments all over Scandinavia and creates and sells software solutions to different markets.

Case D is a large organisation on the SME scale. They use a staged development method but have implemented some agile techniques. The organisation is described as mature in regards to digital self-service solutions and has developed digital self-service applications for years. This company is an independent consulting and software company.

B. Data Collection and Analysis

All data was gathered over a time period of a year. Qualitative interviews were conducted by phone with project managers from 11 of 12 identified digital self-service providers, with the objective of how self-service providers were accepting and using the user-centred materials and learn about each company and their development approach [19]. This lead to a focus on one public self-service area with four identified self-service providers with the objective of how the user-centred requirements were used, and we conducted a redesign of the existing requirements [10].

For our case study, we had one half-day meeting with each of the four companies. Present at this meeting was the product owner or project manager. The agenda for these meetings was an introduction to this study including a discussion of their gain of participating, as we offered inputs on their self-service solution and conducting a usability evaluation, which they could use to improve their self-service application.

After the introduction the company presented their organisation overall and, more specifically, how they were developing this chosen self-service application, including development process and method, collaboration with stakeholders and end-user involvement. They also gave a demonstration of the self-service application in its current state. Lastly, it was discussed which people to interview in the next part of our study to ensure we would cover all perspectives. We had before the meetings identified the roles of the people we would like to interview, as these roles were named differently in each company and some people would have more than one of these roles. We conducted a list of people with the meeting. The roles we had identified were the following; project manager, developer, interface designer, and the person responsible for the user experience and usability of the public self-service application. We interviewed 14 people distributed across the four companies. The purpose of the interviews was to determine current practice at each of the four companies in regards to customer and citizen involvement, and how the end-users were taken into consideration during the design and development process. We found that interviewing people with different roles and responsibilities would provide us with more data

on different perspectives and areas of expertise inside each company.

All interviews were conducted by phone and transcribed afterwards. All as semi-structured qualitative interviews as described by Kvale [4]. After all, interviews were conducted, the data was analysed in regard to the different perspectives of each interviewee and their job function in to get an idea of what each company did during the development process.

We completed a content analysis of relevant documents from the companies. Both, interviews and documents were analysed using Dedoose [6]. The aim of these activities was to study the development process of the four companies developing the digital self-service solutions in this specific self-service area, into more detail. The cases were analysed exploratively.

#### IV. RESULTS

In this section, we present our results. Our findings are divided into three subsections, focusing on customer involvement, end-user focus and their final product. Table II shows an overview of the four companies in regards to these three focus areas.

TABLE II. MAIN CHARACTERISTICS OF THE FOUR CASES

		Company A	Company B	Company C	Company D
<b>Customer Involvement</b>	<b>Focus area</b>	Case workers and their needs	Case workers and their work-load	System fits needs of municipalities	If System is needed customers' willingness to pay
	<b>Involved municipalities</b>	One	Around five	All existing customers	Six
	<b>Involvement type</b>	4-5 workshops, Prototype s	Workshops, emails Prototypes	Workshop	Workshop, emails Online meetings
<b>End-users</b>	<b>Citizen representation</b>	Primarily Case Workers	Primarily Case Workers	Primarily Case Workers	Primarily Case Workers
	<b>Goal</b>	Decisions at once	Optimizing work flows	Flexibility to fit each municipality	Decisions at once
	<b>Usability</b>	Verified by Case Workers	Testing on citizens in pilot releases	Hired specialists	Testing on citizens Hired specialists
<b>Product</b>	<b>Perceived strengths</b>	Applications verified right away	Follows legislation	Part of healthcare system	Part of healthcare system Applications verified right away Follows legislation
	<b>Perceived weaknesses</b>	Lacking usability	One solution fit all	Lacking usability	Lacking usability

##### A. Customer Involvement

In this section, it is described how the four companies involve the customers in the development of digital self-service applications. The section is written from the perspective of the four companies.

###### 1) Case A

The company collaborated with one municipality as a customer and stakeholder. The company insisted that the involved personnel should be case workers who understood their own and the citizens' needs and not necessarily people with IT skills. They use the case workers to learn about the field of application. *“We held a new workshop with the*

*municipality every couple of weeks, here we created mock-ups that we used to design a new prototype, which was evaluated and redesigned at the next workshop, [...] until we were satisfied with the final prototype”.* The company was confident that they have developed a solution that lives up to the wishes and needs of their on-site customer, but is less confident that their solution is covering the needs of other municipalities. *“We have discussed if we should have created a standardised solution covering the needs of as many municipalities as possible.”* They describe it as a problem for them that they were not aware of the fact that the interpretations of legislation are not the same in all municipalities.

###### 1) Case B

The main focus of the digital self-service application is on the back-end of the system, and to ease the workload of the case workers. *“Our primary focus is to simplify the working procedures for the case workers, otherwise, this would never be a priority for the municipalities”.* Before developing this solution the company hosted workshops with the municipalities that are already customers, with the purpose of analysing the working procedures, used for creating a specification of requirements and a business case.

*“On the first workshop we are not presenting anything, typically we say – we don't know anything, tell us about your work [...] we use these workshops to learn how we digitally can support the digital work flow.”* This information is used in the development phase, where first iteration is developed, and a prototype is created. The prototype was presented at the next workshop to the municipalities involved in the development process. The prototype shows the flow from a citizen filling out a form and until it lands with the case worker. They also described sending emails to all existing customers asking them to answer questions in regards to their work flow.

## 2) Case C

The focus of the company is creating a solution that all municipalities can use. *“It makes a very big difference if you are designing something for a large or small municipality. There is a very big difference in relation to how things are done or used.”* They describe developing an application that fits all types of municipalities, by developing a blank form that the municipalities can set up as they wish to get the citizens' to provide the information that each municipality finds important. This also means that each municipality buying this solution has to write all the text going into this digital self-service application.

Municipalities are involved in the development process by a forum for the exchange of experience that the company is hosting for the municipalities that are existing customers. These workshops are hosted several times a year. *“In regards to this specific solution we already have a solution that the citizens can access to fill out other applications or to get an overview of their own records, so this new application will be developed to be part of this existing system.”* Existing customers have been involved through these previously held workshops but no customers are directly involved in the development of this digital self-service application.

## 3) Case D

The main focus of this company is on the back-end of the digital self-service application. The company has involved municipalities by conducting a workshop with people from municipalities who are already customers. Representatives from six municipalities participated as on-site customers. The company hosted a workshop to learn about the number of applications and generating of ideas. At the end of this workshop, a specification of requirements was generated.

The municipalities were involved several times during the development process but mainly through online meetings or email. This was chosen as a consideration for the employees. *“Every time we have to pull the employees away from doing their normal job in the municipalities [...] Online meetings still gives them the ability to provide inputs. [...] When ever we have a question we send an email asking if we are doing the right thing.”* They described that involving the customers during the development process is a fairly new procedure. They now see this as best practice as it means they can do changes during the development process as changes late in the process are expensive and complicated.

## 4) Summary of Customer Involvement

Companies A, B and D asked on-site customers to participate during both design and development process. Companies A and B held continuously design workshops, where company D held one at the beginning and later primarily had remote access to the involved municipalities. Company C gathered information from workshops before the design phase but had no customer involvement besides that. Companies B and D stated that they mainly focused on the back-end of the system to be used by the case workers. Companies B, C and D all stated that they were aware of that the municipalities have different needs as it depends on the size of the municipality and their interpretation of legislation. Company A described that they learned eventually that the

municipalities have different needs, though learning this quite late in the process.

## B. End-Users

In this section, it is described how the citizens as end-users are taken into consideration through the development of the citizens' digital self-service applications. Also, what each company does in regards to ensuring the back-end systems meet the requirements of the case workers.

### 1) Case A

The citizens are not involved in the development process but the company describes taking them into consideration by ensuring that the procedures for sending an application are as simple as possible. *“We have created the solution so it should be understandable for all types of people. We have a good feeling here and our self-service application has been verified several times (by case workers)”*. They have built an application that in the simple cases can send a decision back to the applicant right away without a case worker having to go through the application first. The company also described that their main focus is on the customer and not the citizens. *“We have been focusing on the customers' needs and work procedures, it have been important for us to understand what they wanted the citizens to do”*. This perspective was chosen because the municipalities are the paying customers and not the citizens.

### 2) Case B

The company does not involve citizens in the development process but they involve the municipalities and case workers as a representation of the citizens' needs. *“The municipalities give us feedback in regards to what is not working for the citizens, e.g. parts of the application that citizens consistently fill out wrong”*. Though focus is not directly on the citizens the company feels that an optimisation of the back-end also brings value to the citizens as this will give a better flow with the handling of their applications. The company finds that focusing on accessibility of the system is more important than focusing on usability for the citizens.

They did describe testing the application with users before launching the digital self-service application. *“We have some pilot municipalities [...] they are part of a test phase where we assemble data for statistics”*. For the municipalities and case workers, they focus on improving the efficiency of the work flows.

### 3) Case C

The company does not involve citizens in the development process. They describe creating a system that the municipalities can change to fit their needs. *“We have structured it so the municipalities can make adjustments where and if they see fit, e.g. in regards to rewriting phrasings or functions that can be added or removed”*. The municipalities and case workers were involved prior to the design and development phase. The design and work flow were designed at workshops held prior to the redesign of this digital self-service application. The company focuses on usability by having usability specialists hired.

#### 4) Case D

For this digital self-service solution, the company describes focusing on the citizens' needs and their flow through the application. *"We know that this system is developed mainly for senior citizens, meaning that this system needs to be as simple as possible. This includes that all descriptions and wordings need to be easy understandable"*. The company has discussed if they spent too much time on the citizen angle. *"The end-user is not the one buying our product, it is the municipalities, [...] what matters is if they think our self-service solution is good"*. The digital self-service application is described as being part of a larger health care system, where citizens will have access to, e.g. former applications and the municipality will have everything in regards to one citizen in one record. For this digital self-service application, they have used senior citizens without much experience with computers, to fill out a digital self-service application. In regards to the case workers and municipalities, they described focusing on full automatic digital self-service applications when possible. "

#### 5) Summary of End-User Involvement

Neither of the companies has citizens directly involved in the design or development process, although companies B and D described testing their developed public self-service application on citizens after the development has been completed. Companies A and D implemented automatic decisions when possible, benefiting for both citizens and case workers. Companies A, B, C and D all described that focusing on the needs of the citizens has not been made a priority, only the needs of the municipalities as customers. Company D described that they needed to focus less on the citizens and more on the municipalities as customers.

Companies A and D have mainly focused on the target user-group in regards to keeping the design simple for the citizens. Company B focused primarily on the flow of the end-users in their solution, and company C has used usability specialists to check if the design was usable for the citizens.

### C. Product

This section is about the strengths and weaknesses perceived by the company about their own digital self-service solution, both in relation to the municipalities, case workers, and the citizens.

#### 1) Case A

The company perceives it as a strength that they have developed what they describe as a "whole solution" covering both the necessities for the case workers and the citizens. *"Our solution has a good flow for the citizens with understandable screen displays. It is not heavy on wording and we only ask for information that is actually relevant for the municipalities to keep things as simple as possible."*

The company also identified some weaknesses in regards to their digital self-service application. They described that the fact that they only collaborated with one municipality might have been an issue, although they did not see it as a real option for them to have involved 3-5 municipalities in the development process. The company also recognises that there might be usability issues in the digital self-service application but argues that this is substantiated in what the

municipalities are actually willing to pay for. *"Reality is just different than theory. If you want to pay for it, you can get the great solutions focused on usability, but that is not what the municipalities want to pay for"*. The company describes that if the customers do not care about usability they will not focus on that either.

#### 2) Case B

The company perceives it as a strength of their digital self-service application that they have involved different kinds of professionals in the development process. They feel that the role of the product owner creates more value as he also has to ensure that the digital self-service application follows the legislations even if it changes. They describe ensuring to develop usable and intuitive digital self-service applications.

Late changes are described as being possible because the application is built in modules making changes less expensive. A perceived weakness is creating one solution to fit all needs. This is done as updating or testing would be too expensive if municipalities wanted something changed.

#### 3) Case C

The company perceives it as a strength of their digital self-service application that they have developed a solution where the citizens can do everything in one place. *"The citizens never leave their medical file when they need to fill out the self-service application"*. They also perceive it as a strength that they have tried to cover all aspects of the needs that both citizens and case workers have.

A perceived weakness is that they feel they might not have spent enough time on usability when developing the digital self-service application for the citizens. *"The self-service application might be kind of crude, people need to have prior knowledge to be able to use it.."* A concern about if feeble citizens would be able to fill in the application was raised.

#### 4) Case D

The company perceives it as a strength that they have integrated this application in their general healthcare record solution. *"The citizens can see the full catalogue of the services the municipality offers and, after they have applied for something once, it is possible to make a reorder without starting over with the application."* They feel that they have simplified processes that otherwise might be difficult for feeble citizens. For the case workers they see their solution as a strength in regards to, when an application ends up with the case worker, the system has already validated that the citizens are entitled to what they have applied for.

It is perceived as both a strength and a weakness that they always make applications that follow the legislation though some municipalities might have other requests. It is perceived as a weakness that they have been bound by an existing design on the general healthcare record solution. They feel this application might lack usability and that some written information might be too small for the application.

#### 5) Usability of Products

To evaluate if the development process had resulted in usable self-service applications for the citizens, a usability evaluation of these four self-service solutions was

conducted. This was done as a think-aloud usability evaluation in a usability laboratory, with eight test persons. For the evaluations, all test persons received the same instructions explaining what they were meant to do during the evaluation, e.g. conduct a set of tasks and think aloud during the evaluation. All participants received the same tasks, and evaluated all four systems, but evaluated them in a different order.

The test persons were chosen to represent a user segment as large as possible. Our test persons ranged in age and had different educational backgrounds. The test persons had different level of experience with computers though all use the Internet on a regular basis. They had different level of experience in regards to public services. Most had experience with other public digital self-service areas but not this specific area.

An overview of the test persons can be found in Table III below.

TABLE III. FOUND USABILITY PROBLEMS FOR EACH DIGITAL SELF-SERVICE SOLUTION

Test person	Gender	Age	Education	Experience with public services
TP1	F	44	High school degree (early retirement because of health issues)	Yes, also for this application type, and done digitally
TP2	F	31	Phd-student in Social science	Yes, for other service areas, and done digitally
TP3	M	52	Accountant	Yes, for other service areas, and done digitally
TP4	F	64	Retired school teacher	Yes, for other service areas, but not digitally
TP5	F	66	Technical assistant	Yes, also for this service area, and done digitally
TP6	M	30	Msc. Engineering	Yes, for other service areas, and done digitally
TP7	M	65	Retired computer assistant	Yes, for other service areas, and done digitally
TP8	M	22	Bachelor student in computer science	No experience

All test persons received a small gift after participating in the evaluation.

After conducting the evaluations the data was analysed using the method Instant Data Analysis (IDA) [26]. The usability problems were categorised after the criteria described in Table IV. The problems were categorised in regards to levels of confusion and frustration of the participants, and whether they were able to fill out the forms correctly. These criteria and categorisations were described further by Skov and Stage [17].

TABLE IV. DEFINING THE SEVERITY OF THE USABILITY PROBLEMS IN THE DIGITAL SELF-SERVICE SOLUTIONS

	Slowed down	Understanding	Frustration or confusion	Test monitor
<b>Critical</b>	Hindered in solving the task	Does not understand how the information in the system can be used for solving the task	Extensive level of frustration or confusion – can lead to a full stop	Receives substantial assistance, could not have solved the task without it
<b>Serious</b>	Delayed in solving the task	Does not understand how a specific functionality operates or is activated	Is clearly annoyed by something that cannot be done or remembered or something illogical that one must do	Receives a hint, and are able to solve the task afterwards
<b>Cosmetic</b>	Delayed slightly in solving the task	Does actions without being able to explain why (you just have to do it)	Only small signs of frustration or confusion	Is asked a question that makes him come up with the solution

An overview of the usability problems is shown in Table V.

TABLE V. FOUND USABILITY PROBLEMS IN EACH DIGITAL SELF-SERVICE SOLUTION

	Company A	Company B	Company C	Company D
<b>Critical</b>	2	5	0	1
<b>Serious</b>	17	18	11	15
<b>Cosmetic</b>	17	14	6	13
<b>Total</b>	<b>36</b>	<b>37</b>	<b>17</b>	<b>29</b>

Of the identified problems, 11 were found across all four digital public self-solutions. Among these general problems was lack of understanding of the purpose and flow of the self-service solutions, problems with attaching files, test persons getting annoyed or confused by not being able to understand helping texts and the descriptions of the rules and regulations of the application area, leading to test persons filling in the wrong information in the text fields. And, misunderstanding data fields, also leads the test persons to fill in the wrong information in the text fields.

6) Summary of Products

Companies A and D highlight simplified processes as strengths in regards to their public self-service applications. B and D find the fact that they focus on developing applications that follow the legislation as a strength. C and D both describe it as a strength that the self-service application is integrated in one healthcare solution for all public healthcare applications. Companies A, C and D believe that a weakness of the citizen centred self-service applications might be lacking usability. This has not been made a priority by the companies as it was not a priority for the municipalities.

The applications from C and to some extent D, were significantly smaller and less complex than the applications developed by companies A and B.

Both applications from companies C and D were part of larger healthcare systems and therefore much less information had to be filled in by citizens themselves. Especially the application developed by company C was very plain and did not address any of the issues that companies A and B, and to some extent company D have tried to solve in their solutions, like adding features automatically generating decisions, or the possibility of attaching relevant documents to the application. The application from company C was created as a paper application in pdf-form. Although C and D showed a higher degree of usability, the utility of these solutions were significantly lower than the applications from A and B.

## V. DISCUSSION AND CONCLUSION

The Danish digitalisation effort has been taken to support the development process and provide each municipality with more digital self-service solutions to choose from, and enhancing usability in these solutions. For this purpose, two sets of guidance materials were created, a user journey and a set of 24 usability criteria, respectively. The aim was that this approach would facilitate competition between the self-service providers, resulting in better and more user-centred self-service applications for the citizens. All four companies involved the municipalities in the design process both in regards to the back-end of the system meant for the case workers and in regards to the self-service applications meant for the citizens. Two of the companies described involving citizens quite late in the process for testing of the features, either by going live in a few “pilot-municipalities” or conducting a usability evaluation.

Though a user-centred approach has been taken, our results correspond with the findings of Wangpipatwong et al. who found that e-government websites are lacking usability due to poor design and non-employment of user-centred design methodologies [7]. The reason for this is that the municipalities according to the companies are only focusing on this to a small extent and are not willing to pay more than the bare minimum. This shows a mismatch between what the joint IT organisation of the municipalities, and the municipalities are trying to achieve. The public self-service providers are focusing on what the municipalities are willing to pay for and want the citizens to do and not taking the user-centred approach with a citizens' perspective, unless this is being requested by the municipalities. If the user-centred approach should be a success it is important to involve the municipalities as well. They need to understand that quality and cost are complementary [8][9] and why usability needs to be a focus area and why a usable system will be a good investment though it might be a bit more expensive to develop. Bruun and Stage have found that redesigning a digital self-service application focusing on usability, can reduce the amount of time the case worker has to spend on each application, with more than 50% [23].

Jokela et. al. [13] and Mastrangelo [21] describe the importance of usability being specified in the requirements.

It is questionable whether this approach will be successful unless the municipalities learn the values of these requirements and get the understanding that usability will reduce cost over time. It seems very clear that as long as the municipalities are not demanding this focus on usability, the self-service providers will not focus on this aspect either.

To gain an understanding of the development of public self-service applications in Denmark, we have conducted a study of one application area with four self-service providers. We recognise this limitation in regards to drawing conclusions in a broad term about the entire development process. Also, we have conducted a case study involving the companies. As future work, it would be interesting to learn the perspectives of the municipalities from themselves, and not only through the self-service providers.

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