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"We kind of have to do our job alongside the digitalization" – on working with continuously changing tools

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Abstract. Most public organizations are engaged in digtialization to achieve efficiency and innovation. Today, most software is developed, implemented and continuously improved following an agile software development methodology. In this exploratory paper we highlight an understudied aspect of digitalization, emphasizing the need for a deeper understanding of how it affects the day-to-day work in the organization. By examining the experiences of advisors in a public welfare agency, the paper sheds light on the challenges and complexities arising from digitalization on work in practice. The findings reveal a discrepancy between the idealized view of digitalization and the practical realities faced by workers, leading to fragmented work conditions and continuously changing tools. This paper seeks to contribute to a nuanced understanding of the impact of digitalization on work practices.

Introduction

Digitalization is often expedient to increase the efficiency in public administration with regard to case handling, while simultaneously ensuring more correct handling of cases in light of the current regulations. In the context of public administration, digitalization is about "renewing, simplifying and improving" the existing services and facilitating for increased value creation and innovation (Ministry of Digitalisation and Public Governance, 2014). Digital transformation in the public sector is seen as "an important endeavour that is instrumental in public administration effectiveness as well as the promotion of democratic values and mechanisms” (Jonathan, 2020, p. 224). Often, the overarching goal of digitalization is to become a digitally transformed organization that is better equipped to withstand the stresses of a constantly changing society (Byremo and Fjellanger, 2024). Digitalization can be understood as a continuous organizational development process, i.e., a constant and never-ending process (Ribes, 2022).

Most IT development in public sector organizations uses agile methods (Jørgensen, 2024). While agile development is "relative to each organization" (Tendedez et al., 2018, p. 2), what distinguishes agile development from traditional, plan-based development models is the aim to "address the challenge of an unpredictable world by relying on people and their creativity rather than on processes" (Dybå and Dingsøyr, 2008, p. 835). As such, agile development generally refer to approaches that emphasize flexibility, collaboration, and iterative improvements (Agile Manifesto, 2001). Projects are broken down into smaller, more manageable tasks to handle changing requirements and feedback from users (Dybå and Dingsøyr, 2008; Dingsøyr et al., 2012).

In an empirical study of 14 “heavily digitalized” public organizations in Norway, Bygstad and Iden (2024) found that the most “mature” digitalized organizations “focus less on strategy and more on continuous development (...) based on the premise that the organization has a digital infrastructure in production, which is extended with new products and services, responding continuously to customer demands and new digital options" (Bygstad and Iden, 2024, p. 6). One of their informants stated that "our focus is on continuous innovation of services, I am particularly focused on exploiting windows of opportunity when they open", while another informant argued, "our job is to digitalise despite the existing technical and organizational structures. Continuous and agile development requires that we cannot wait for the old structures to change; rather we must build new structures on top of the old ones.” (Bygstad and Iden, 2024, p. 7).

Both in academia and in business, agile approaches to development processes are preferred. It is pointed out that increased flexibility and more autonomous teams will achieve the goals for digitalization in the best possible way: "It seems that the emphasis on delivering value for customers through learning along the way, earlier and frequent deliveries, better utility management along the way and more flexibility in what is delivered, are flexible elements that have a good effect on digitalization" (Jørgensen, 2024, p. 80).

In this paper we focus on the work that is done in the organization. We particularly want to understand how the people who carry out the work experience the digitalization. We aim to add to the prevailing understanding of agile development processes by showing how the continuous development is experienced by those who use the continuously changing systems to support their everyday work practice. Our aim is to suggest how CSCW can contribute to a debate on how organizational change is carried out.

The paper is structured as follows. First we briefly present our empirical case and methods for data collection, before we present our findings, focusing on how digitalization affects the work that is carried out, how workers cope with the changing conditions for carrying out their work, and how digitalization is experienced as an additional part of their work. Finally, we discuss our findings, focusing on what CSCW as a research field can contribute to the prevailing discourse on digitalization.

Empirical case and methods

The Labour and Welfare Administration (WA) aims to contribute to social and economic safety for the citizens, with a focus on the citizens' employment and activity. The WA seeks to help citizens maintain a sustainable life in times of economic challenges by offering a variety of services and financial benefits related to unemployment, sickness, disability, pension, and so on. As such, their areas of administration requires collaboration and data sharing with a large number of other actors, both public and private. WA's organizational structure includes a large central Directorate where the IT department is located, and over 250 local offices distributed in the municipalities all over the country. Most services and welfare benefits are handled at a governmental level, except for social welfare, i.e., 'the last security net' for citizens, which is handled by the municipalities.

The front-line workers who follow up on citizens are generally referred to as 'advisors' as they manage the clients' cases over time, with a focus on helping the clients find or keep employment, or assess if they need financial benefits due to loss of work ability. Hence, the advisors predominantly work with helping people who are in difficult life situations with navigating their situation and the WA. The advisors in local offices have a portfolio of clients they are responsible for. In our fieldwork, we encountered advisors whose portfolio consisted of approximately 15 cases, and others who had up to 200. As a general rule, the smaller the portfolio, the more complex each case is. The advisors' job description thus focus on helping clients get the help they need within the context of WA. Their daily tasks involve meetings with clients, answering inquiries from clients or other actors related to a case (e.g., doctors, employers, and other WA units) and other case handling tasks.

To do their work, the advisors must use a number of IT systems (see Figure 1). Due to organizational change over time, the number of systems have grown, and they regularly use up to 6 different systems to handle their work tasks, in addition to other tools such as Microsoft Word, Teams, e-mail and the Intranet. *Old CMS* is a case handling system that was implemented at the beginning of the 2000s. The advisors we have interviewed state that this system is used mainly for tasks related to 'work-oriented follow-up,' e.g., registration for activation measures, case handling of applications, and reporting from meetings. In this system, there is a lot of necessary information about the clients, as well as CVs, vacancies, information on measures, etc. *Archive System* is referred to by the advisors as an archiving system that should contain all documents that belong to the client's cases. In addition, they can find information on payments and other information related to the client here. This system is also used for internal communication in the WA where the advisors can send inquiries to other WA units. *New CMS* is used by the advisors mainly as their 'view' of the client's page online. Thus, this is the system the advisors use to interact with the clients digitally, e.g., through the Digital Dialogue (messaging service) or the Activity Planner (the client's 'pathway to employment'). *Ancient CMS* is a case handling system that was developed in the late 70s and has been in use ever since. Today, this is rarely used by advisors, but in certain cases parts of a case handling process must be done here. To handle the separation between governmental and municipal services and benefits, all cases related to social welfare is handled in a separate IT system: *Municipal CMS*. Furthermore, a *Communication system* has been implemented in recent years. This system is described as an off-the-shelf communication tool that allows for communication both internally and with actors external to WA, such as employers.

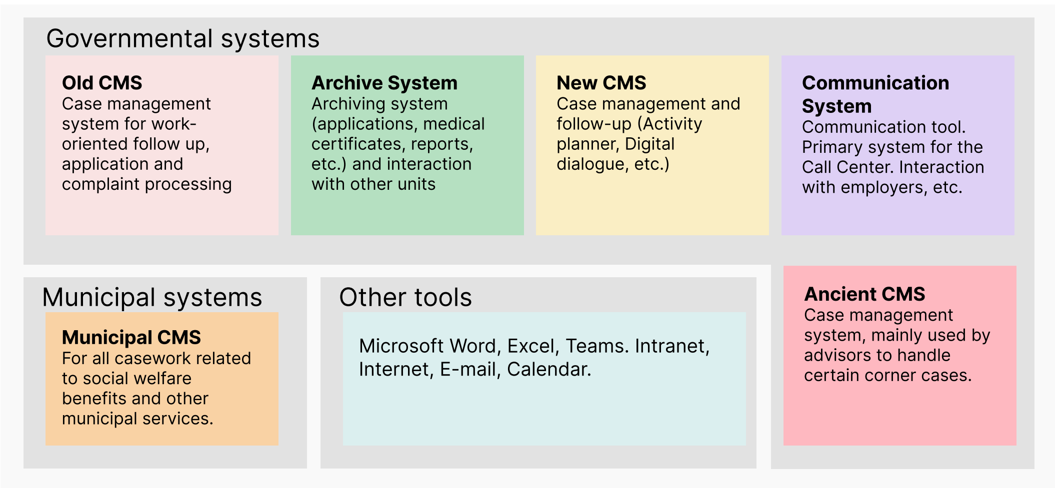

Figure 1. An overview of the systems in use on the front-line.

Methods for data collection

The data we build on in this paper are mainly from interviews and observations of advisors working on the front-line, conducted between 2019-2023. In addition, our overall understanding of their work situation is based on interviews with the other groups of employees, e.g., people who work with IT-support or training in the local offices. In total we have interviewed 7 advisors and 7 employees in other roles. We have conducted semi-structured interviews where we have focused on asking questions related to the employee's role and tasks in WA, particularly on how the employee uses the digital systems in their everyday work. Some of these interviews have included groups of employees. The interviews have been transcribed and analyzed for problems and themes relating to changes in the work practice. All participants have been made aware of the study's content and signed a consent form, and the audio recordings have been stored according to the current guidelines for research data.

The observations of advisors working were made at the participant's workplace. The length of the observations varied depending on what the individual advisor had time and opportunity for, but we estimate that each of the observation sessions lasted between 2-6 hours. The researcher who made the observations sat with the advisors while they carried out their tasks, asked questions, and talked about the work along the way. In addition, the researcher was allowed to participate in certain meetings attended by the advisor. The data from the observations are documented in the researcher's field notes. As the advisors most often work in an open office environment, we considered it unethical to make audio recordings of these.

Digitalization in practice

This section presents our analysis of the collected data.

Fragmentation of work

> "If I am to process a complaint on [the refusal of a financial benefit], I find the actual complaint and GP's documentation in the Archive system, and then there are conversation reports in New CMS, and then I have to go through Municipal CMS to see if the client has received social welfare benefits, and then I do the actual casework in Old CMS."

The digitalization in WA has made it possible to more efficiently cooperate with external actors such as medical professionals and employers with regard to the documentation that is needed in the handling of each individual case. Furthermore, in recent years, online self-services has made it easier for clients to, e.g., send applications, send inquiries to the WA, and manage their cases. Such developments have contributed to the growing number of IT systems in use at the front-line, as new functionality has required technology that was not available in the older systems. Additionally, when cases are handled digitally, i.e., are made up of bits and pieces of digital information and documentation, it has become more convenient for WA to distribute the decision-making power between WA units. For instance, their 'second-line' units mostly make the final decisions on granting or refusing citizens financial benefits.

For the advisors on the front-line, this fragmentation of their work has lead to changes in practice. Throughout their day, they work with clients' cases in increments, e.g., by answering an inquiry from one client before registering a complaint from a different client. However, to make the right decisions and guide their clients successfully, they depend on maintaining an overview of individual clients' cases. To accommodate the fragmented nature of cases and work tasks, one advisor kept a Word document as a 'living documentation' for each of her clients, where she kept her notes regarding the case for easy access and a better overview. Similarly, due to the many different systems, their work tasks are also fragmented in themselves: while doing one single task they regularly navigate between several different systems and tools, as exemplified in the quote above.

Change is fast-paced and continuous...

> "It's problematic if you think you have learned a routine, and just do it as you remember because it can be wrong as the routines change so often."

The daily work on the front line is characterized by IT systems that are constantly changing. We were told that in a given month, the IT department performed 1400 'production settings'. While most of these are 'under the hood', it illustrates the pace of development. Most changes made to the IT systems are small, but they occur in an already complex environment. An important focus for the software development in WA is phasing out the older case handling systems, i.e, Old CMS and Ancient CMS as they are built on technologies that are 'dying'. The goal of getting rid of the old systems dictates the kinds of changes that face the advisors: information and functionality are moved to newer systems.

The advisors experience the development as fast-paced. From one day to the next, functionality and information can be moved from one system to another, or there is a new routine to do a process. An example of a type of functionality that has recently been moved to a different system are what is called 'case handling notes', i.e., forms and text that the advisors write to supplement the input in a case handling process. Earlier, these notes were made in Old CMS, but now they are mainly found in Archive System. To make sure that the advisors store the notes correctly, they have access to an overview of which notes should go into what system. According to one advisor, the process of moving the notes have caused confusion beyond the location. She explained that some of the functionality has also been re-named: "Before, there was something called 'letter menu' and that was what we used when we wrote these notes. But now we have something called 'note menu' *and* something called 'letter menu', and these are different things. 'Letter menu' is not 'letter menu' as it used to, but for sending outgoing letters. So if I write a case handling note in the 'letter menu' (...) it will get sent to the client." By the looks of it, the scope of the change is not easy to understand. Some changes may cause uncertainty and complications for the advisors in practice.

Even though there is generally more resistance to certain changes among employees who have been working in the agency for many years, the more recently employed advisors experience the changes as cumbersome, as there is 'always something new'. The IT department are apparently aware of how the continuously changing IT systems can cause frustration and difficulties for users. An example on how they attempt to inform the users of recent changes is through an easily accessible overview in New CMS, where the users can read about changes and how it may affect their routines. When observing an advisor navigating in this system, she accidentally clicked the button and was presented with a list of recent changes. She immediately exclaimed, "what is this?" and said that she was not aware that the button existed.

A different example that illustrates the ever-changing systems is from an advisor who was doing a routine task that spanned several different systems. Even though she does this task regularly in her work, she used what she termed a 'recipe' for the task, i.e., internal documentation describing the workflow, including what needs to be done in each system, which buttons to press, and which text fields need to be filled in. While executing the task, she occasionally returned to check that she was doing everything as described by the recipe. She explained that she prefers using the recipes, as the systems change so often that she does not care to learn routines by heart. Similarly, a different advisor mentioned how, when a database of routine descriptions were moved from one system to another, he needed to learn new techniques for finding the information he was looking for. In the old database, he used his visual memory when looking for entries, but when the new system was implemented, he was required to search for the entries by means of text. As such, he needed to know which keywords to use instead of remembering what the list of entries looked like visually.

Several of the advisors illustrated the large number of system changes by imagining going on holiday for a few weeks. They said they would be "bewildered" upon their return, and that coming back to work would be "a complete crisis, because then you are so far behind" with the developments. While the changes themselves are not always difficult to grasp, it is the totality of changes over time that seem to be challenging for the users.

...but improvements are slow

While the experience of digitalization generally suggests a fast-paced development, the advisors simultaneously express that larger changes and new (innovative) functionality takes a long time before they are implemented in practice. They have an understanding of the overall plan for the digitalization efforts that will affect their work in practice. For instance, they know about the eventual phasing out of the older systems and other, larger bits of functionality that are planned.

Since the beginning of our fieldwork, the advisors have awaited a technical solution that makes writing a certain kind of case handling document simpler. The new solution will delegate some of the tasks in the current process to the clients, while the advisor is supposed to have a supervising role in the process, i.e., checking if the client's inputs are correct, and approving the document before it is used in further case processing. Such a solution would make extensive changes to their work in practice, as the way they do it today require them to, e.g., gather information from a variety of systems, having conversations with the client beforehand, and store it in the correct system.

In 2019, one of the advisors explained that "They [i.e., managers and the IT department] have talked for a long time about how, when we write this [document], we will no longer do it the way we do it today. It will change (...) and they have talked about this for a long time, but for the time being, nothing has happened." In 2020, a different advisor said that "This [document] will be made by the client himself. It will come in New CMS but it has been postponed indefinitely. We will probably receive it little by little." In 2023, we were told that "There will come a new way to make these [documents], but they have talked about it for, what.. ever since I started [in 2018] about how there will be an easier way to make these [documents] and that the client will do it directly from their Activity Planner (...) They have worked on this for years and years, but it still has not happened. There was a solution, but it was taken down as it was not quite right in terms of privacy".

Similarly, in recent years the agency has developed a new deviation handling system, i.e., a system used to report on, e.g., issues with privacy, and for reporting cases where clients behave in threatening or discriminatory manners. The old deviation system was 'really difficult' to use, and it was suggested that deviations were under-reported due to the system. One of the advisors exclaimed that, "They have talked about this for a hundred years and finally it is happening", suggesting that this has been a long-awaited system. As such, digitalization is simultaneously experienced as a perpetual process, and as a process where the advisors may wait for years for changes that they hope will make their work more efficient.

Juggling work and digitalization

> "The development is going so fast. There are probably things that are good, but we don't know how to use them. The digital things take the focus away from a lot of other things — we kind of have to do our job alongside the digitalization"

The advisors' work days are largely governed by how many clients they follow up, how complex the cases are, or how much managerial responsibility they have. There are constant inquiries from clients, employers and doctors, and questions that need to be assessed are sent from other WA units. The advisors at the local offices say that "inquiries come through all channels" all day, and that "it feels like it never stops", meaning that they always have something to do at work.

At the same time, they must constantly deal with changes in the IT systems, learn new or changed functionality or which work routines they must change. In the previous sections, we have provided examples of both small and larger changes. Generally, the smaller changes comes with information from the IT department or managers on how to use the new or changed functionality. One advisor expressed that, "We get information from so many places about new things or things that disappear. There's either an e-mail, or information at a regional level, or news on the Intranet, or... it can be so many places", suggesting that keeping an overview of the changes is difficult.

In cases of major system changes, the training is often more extensive. In such cases, they may have groups of advisors involved at various stages of the process, and employees may need to attend full-day courses to learn the new systems. However, when it comes to all the less extensive changes, the advisors themselves have to set aside time for training, sign up for courses and become familiar with the new functionality. This is in stark contrast to how digitalization was carried out some years ago: "Earlier we went to courses for every new screenshot and every new process. Now we just get a message that 'this is new' and we have to use it", explained an experienced advisor. The individual responsibility for training was an ongoing challenge: "When you work on the front-line and you advise up to 200 clients, you don't have a lot of time to sit down and read about what has happened to the IT systems, and that may be an issue on a daily basis".

Discussion

Tokkonen et al. (2023) note that the drivers for digitalization as a means to introduce changes to work practices are regulation-driven and therefore mandatory, or they are technology-driven and represent more radical changes. These drivers can be seen as pressure for certain changes, or as opportunities to the organization — in WA we see both types. In the introduction we referred to the government's rationale for digitalization of public organizations like the WA as creating a better and efficient administration that is more accessible to citizens, has better IT systems, and aligns with societal developments in general (Ministry of Digitalisation and Public Governance, 2014; Bygstad and Iden, 2024). We also referred to research in software development arguing for agile development as a way to continuously renewing the organization through iterative improvements (Jørgensen, 2024; Tendedez et al., 2018; Dybå and Dingsøyr, 2008). The drivers for change in WA are both imposed by government and made possible by technical development, and are also in line with technically driven changes in other organizations in contemporary society both concerning the aims and the methods.

In this paper we have wanted to describe a side of the digitalization which is both understudied and relevant to CSCW as a research field. CSCW has traditionally been concerned with studying work practices, i.e. how people actually do their jobs (Grudin, 1994; Button and Harper, 1995; Suchman, 1987; Schmidt, 2011). We believe this perspective is missing in a discourse that constantly praises digitalization managed by organizations where IT development teams are increasingly autonomous and flexible (Byremo and Fjellanger, 2024; Jørgensen, 2024; Bygstad and Iden, 2024). WA is an example of a public organization that follows the principles of agile IT development, and where the changes made to the systems hit their users accordingly. Keeping up with digitalization is perceived as a process that must be done while simultaneously doing the work they are employed to do.

Our empirical studies of advisors' work practices have enabled us to analyze digitalization from the point of view of the front-line of WA, i.e., employees whose job it is to realize the public welfare services. We have seen that there is a difference between the prevailing understanding of digitalization and how it is best carried out and the understanding of the work of the front-line advisors in the WA. Their everyday work practices are characterized by complex work tasks that are (supposed to be) supported by a large number of IT systems, and where the systems are changed in partly unpredictable — and important — ways. We have shown how the digitalization over time have led to work conditions characterized by fragmentation, both in terms of tasks, case information, and cooperation. We see a parallel to the classic example by Bowers et al. (1995) where the new system in a printshop is analyzed. The new system is designed for accounting purposes, and it turns out that the workflow suggested by the accounting perspective differs from the printshop workers' view of a smooth "workflow from within". Their workflow would allow them to divide jobs and utilize the printing machines' capacity and schedule breaks without stopping the machines. This is not possible in the workflow "from without". We see a similar difference in the view of digitalization "from without", i.e., outside of the advisors' work, and digitalization "from within". A similar discussion is found in Verne and Bratteteig (2016): they suggest that automation efforts should depart from the work processes instead of what is easy and/or possible to automate.

Tokkonen et al. (2023) shows that the activities concerned with designing changes in work practices, like software development, is usually done at an organizational level. The people at the work practice level of the organization — the advisors — can be seen as "mere subjects to change, expected to adopt and support it" (Tokkonen et al., 2023, p. 820). Even if the agile software development processes involve actual user representatives throughout the process, the experience of the advisors still reflects the feeling of being subjects to change; they can identify with the overall goals of the digitalization (e.g., getting rid of old systems), but in practice, their work tools are rapidly and constantly changing and they have little power over when and how the changes will be implemented. Bråten and Andersen (2023) confirms that the flexibility and fragmented nature of large agile software development projects lead to less involvement and influence by users and trade union representatives (see, e.g., Åkesson et al. (2023); Thomsen and Åkesson (2013)).

The organization of software development as a number of agile teams each focusing on one theme or "product" leads to introduction of changes when they are ready from the agile teams and not when they fit with the advisors' work. The different systems change at different rates, i.e., rates that fits the development teams. We argue that the way the development processes are organized has led to a fragmentation of the work on the front-line in WA. However, the changes that are made may not fit with the work practice of the employees who are carrying out the work, i.e., those who put WA's policy into practice (Lipsky, 2010). The fragmentation of work can lead to a feeling of incompetence and vulnerability because they are dependent on using the systems to do their work. They also worry about coming changes in their work and of unemployment (Åkesson et al., 2023, p. 8). The advisors are expected to deal with and learn most of the changes by keeping up with the news, but in their busy everyday work, they do not always have the time to keep track of the changes until they affect their work explicitly.

In large public organizations, an aspect that increases complexity is often that the systems are used by employees in many different roles, at many organizational levels. Developing systems that take everyone's work activities into account is indeed challenging, but as we know that digitalization is a continuous, possibly ever-lasting process, should we not try to shed light on digitalization from several perspectives, and aim to maintain the workers' control of their work? Digitalization is not going to finish (Ribes, 2022). A debate on how organizational change should happen and what digitalization is for will benefit from more studies of the work practices that are affected by the changes introduced by digitalization.

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