Socially Sustainable Digital Transformation in the Public Sector: a Systematic Literature Review

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Abstract

Digital Transformation (DT) has been increasingly promoted in the public sector as a possible approach to enable digital government. However, the impact of DT on citizens and public sector employees remains understudied. We propose to address this as a problem of social sustainability. This theme is at the core of the Information Systems (IS) sociotechnical research agenda. In this paper, we present the preliminary results of a systematic literature review to understand better how IS scholars can address social sustainability in the context of DT in the public sector. We identify seven emerging research themes divided into four major areas focusing on citizens, social workers, intelligent technologies, and public encounters. Finally, we present four implications highlighting guidelines for practitioners to implement a socially sustainable DT in the public sector, possible research avenues in the IS field, and a preliminary definition of socially sustainable DT in the public sector.

Keywords: Social Sustainability, Public Sector, Digital Transformation, Digital Citizen, Social Worker

1. Introduction

Citizens' demands for better and faster public services offered by governments have been rising in the last few years. We are witnessing societal changes characterized by a demographic evolution. For example, an increasing elderly population calls for more elder healthcare services, while causing a decrease in the workforce hence less tax income (OECD, 2016). Digital Transformation (DT) has been proposed as a possible solution to face these challenges, offering many advantages (Mondejar et al., 2021; OECD, 2016). However, DT projects in the public sector are usually implemented because of political pressure and tend to fail due to the complicated challenges they face, such as the necessary organizational changes and digital services provision (Jonathan, 2020). With the term public sector services (often used interchangeably with welfare sector) we refer to all those services offered by the government that aim to improve the quality of life of a citizen. Examples of services can be support in finding a job during unemployment, or sick-leave benefits. We define *citizens* as all those individuals who need to access the services offered by the government, regardless of their citizenship. DT is the fundamental enabler to reaching the digital government goal, the stage where technology and citizen preferences are combined to convey public services increasing efficiency and productivity (OECD, 2016). DT in the public sector regards the digitalization and automatization of work processes, the set up of digital channels to provide services to citizens, and the recent interest in introducing cutting-edge technologies such as Artificial Intelligence (AI) (Lindgren et al., 2021). Research in Information Systems (IS) and the neighboring fields has however demonstrated that DT has an impact on both public sector employees (also called social workers or frontline workers) and citizens that is often underestimated (Fleron et al., 2022; Schou and Hjelholt, 2019). This is reflected in the tendency to oversee social indicators in evaluations of DT in the public sector (Pedrosa et al., 2020). The IS field is uniquely positioned to contribute to counter this, by balancing technology-oriented instrumental gains with socially oriented human-centric perspectives on DT (Sarker et al., 2019). From this point of view, research on DT has an important role in addressing the United Nations's Sustainable Development Goals

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(SDG) (Mondejar et al., 2021), although most DT programs in the public sector do not directly address them (Norström et al., 2022). Nevertheless, it is necessary to be cautious because DT can also hinder SDGs (Vinuesa et al., 2020), as it might have the paradoxical side effect of bringing discrimination and more stigma on already marginalized groups (Schou and Pors, 2019). Current DT processes tend to oversee many stakeholders' needs and lack a focus on the risks related to the transformation, considering only the positive outcomes (Dobrolyubova, 2021), taking the side of those who want to implement the DT at all costs and not looking at the recipient perspective (Breckenridge, 2019). In sum, this situation triggers the consideration of DT as the outcome instead of a means toward improving the social sustainability of public services (Dobrolyubova, 2021). We define social sustainability as the process that "focuses on ensuring current and future generations have the same or greater access to social resources by pursuing generational equity" (Lago et al., 2015, p.3). In the IS literature, few studies address sustainability (Gholami et al., 2016; Tan and Nielsen, 2022), and those that do, do not usually focus on social sustainability. As a result, there is a need for further research on how DT in the public sector can be socially sustainable, both from the perspective of workers whose work practices are changed by DT (Plesner et al., 2018), and from that of citizens who must not be excluded and marginalized by DT (Agostino et al., 2022). To address this, we performed a preliminary systematic literature review incorporating many different fields and not limiting the search to IS. We aim to analyze how DT projects in the welfare sector address social sustainability and understand best practices. Therefore, we define our research question as follows: *How can digital transformation in the public sector address social sustainability?* We contribute to the IS literature by identifying and synthesizing empirical and theoretical studies on DT in the welfare sector. In doing so, we paint a broader picture of DT in the public sector and identify possible avenues toward social sustainability. We propose a preliminary definition of socially sustainable DT in the public sector and guidelines for performing such DT. Finally, we show that research on the topic is needed in the IS field.

2. Background

2.1. Digital Transformation

The literature offers different definitions of DT. For example, Vial (2019) defines it as "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies" (p.5), while Wessel et al. (2021) collected different definitions and concluded that most of the definitions of DT refer to "some sort of digital technology [that] is expected to lead to favorable business outcomes" (p.7). DT not only concerns the digitalization of a service but also brings in an extensive review and revision process (Mergel et al., 2018). According to Wessel et al. (2021), DT is characterized by the "redefinition of the value proposition" and by the "emergence of a new organizational identity", where with *value proposition* it is intended how value for the clients is crafted, while with *organizational identity* how an organization defines itself. The DT concept was born in the private sector and most studies still focus on the private sector (Jonathan, 2020; Plesner et al., 2018). However, there are several significant differences between the public and private sectors (Jonathan, 2020; Plesner et al., 2018), so specific studies about DT in the public sector need to be developed (Reis et al., 2018). A redefinition of values and organizational identity for welfare organizations that need to provide the same services for citizens' well-being is pointless, and the public sector needs to be more concerned with providing a good and accessible service rather than with business outcomes.

2.2. Sustainability and DT in the Public Sector

Sustainable transformations are often defined as "developments that meet the needs of the present without compromising the ability of future generations to meet their own needs" (OECD, 2008). DT often enables sustainable transformations (Mondejar et al., 2021). However, DT processes usually disregard sustainability aspects (Messner et al., 2019). This is unfortunate because DT is envisioned as necessary to achieve sustainability as it aims to create services accessible by everyone providing facilitated and rapid access to them, diminishing the expenses from the provider's side (Mondejar et al., 2021). Lago et al. (2015) suggest a framework with four different aspects of sustainability to take into consideration when building a software system: Social, Environmental, Technical, and Economic Sustainability. Social sustainability, which includes granting current and future citizens the possibility of using the services in the same way or with even more benefits than before, is a fundamental dimension in the public sector context. Moreover, as welfare organizations usually work with vulnerable and marginalized people, the social and ethical aspects must be considered (Schiffhauer and

Seelmeyer, 2021). For example, it is necessary to address the digital divide, intended as the ability of people to access and use technology, if the citizens are requested to interact with a digital system on their own (Vassilakopoulou and Hustad, 2021), and to deal with the necessary training for social workers that have to learn the new system (Dolata et al., 2020). A digital public sector "assumes that computers can perform work tasks and support citizens in doing theirs by presenting enough information for them to have "adequate knowledge" for doing their work in a correct way" (Verne and Bratteteig, 2016, p.3). DT is a broader change. Its goal is to enhance accessibility and efficiency of public services through the usage of technologies and it involves an organizational change (Jonathan, 2020), defined by Van de Ven and Poole (1995) as the "difference in form, quality, or state over time in an organizational entity" (p.4). DT of public services generates many advantages, such as optimizing personal time, improving governmental practices, and delegating administrative tasks to citizens (Jonathan, 2020). Performing DT in the public sector leads to a change in the work practices of social workers and to the increase of the citizen's responsibility when they need to get a service (Holten Møller et al., 2020; Schou and Hjelholt, 2019), and calls for strategies and policies to address these issues (Fleron et al., 2022). If not performed in a socially sustainable way, DT can lead to hinder citizenship and even democracy (Idzi and Gomes, 2022), creating problems for citizens such as digital divide, risk of discrimination, and lack of transparency, and for governments, such as excessive costs and lack of skills and infrastructures (Dobrolyubova, 2021).

3. Methods

We performed a Systematic Literature Review (Levy and J. Ellis, 2006), an essential tool for providing a comprehensive summary of current literature relevant to our research question. We decided on this method as it is an instrument to have an effective and rigorous synthesis of how the topics are addressed in the literature, and which are the gaps in the field (Levy and J. Ellis, 2006). We followed the guidelines by Webster and Watson (2002) to identify and present emerging concepts.

Databases and Search Terms A literature search was conducted on 13 February 2023 in the databases *AIS Electronic Library*, *Web of Science*, *ACM Digital Library*, *Scopus* and *Compendex* by experienced librarians. The search was limited to English-language publications. The search string was built by combining terms that include welfare sector (Population) and digital transformation (Intervention) concepts. We experienced that adding keywords for the social sustainability aspect (Outcome) limited the search because outcomes were rarely mentioned explicitly in the abstracts. In addition to combining the grouped search terms with AND, we used a proximity operator to limit the number and increase the relevance of the search hits. The search string was tested and modified several times before the final search. Duplicates were removed using the AI tool *Deduklick* and some additional duplicates were removed using *Endnote*. The following search string was used in the literature search and tailored to each database: *("public sector*" OR "public assistance*" OR welfare OR "social security" OR "social support*" OR " social assistance" OR "social aid*" OR "social service*" OR "citizen* well-being" OR "digital government" OR e-govern*) AND (digital* OR comput*) W/2 (art*fact OR transformation* OR intervention* OR shift* OR evolution* OR transition* OR innovat* OR "social innovat*" OR moderni* OR technolog* OR digiti* OR digitali*).*

Selection process The selection process, shown in Figure 1, consisted of two stages: 1) screening based on abstract and title using the *Rayyan* platform; 2) full-text screening. All authors were involved in the screening process. In case of disagreements, the final decision was discussed and taken by the main author and one or more additional reviewers. Before analyzing the retrieved papers, we developed inclusion and exclusion criteria as shown in Table 1. Criteria for stage 2 are to be considered in addition to stage 1's. As this is a preliminary study, we kept only papers from and including 2018.

Table 1. Inclusion and exclusion criteria

STAGE 1
INCLUSION:
• Digital technology is involved and public sector is the context
• Impact on people: either they have to use the technology, or it has a direct impact on their life
• An IT artifact is involved
• Good practices or practical recommendations
EXCLUSION:
• Non-English language
• Thesis, books, introductions of conference proceedings, panels, papers published before 2018
• Private sector as a context
• Technologies that treat a specific disease or clinical condition
STAGE 2
INCLUSION:
• The empirical studies need to have an adequate description of the process
• The outcome has implications for social sustainability
EXCLUSION:
• Not complete papers and duplicates
• Not peer-reviewed- and low-quality papers

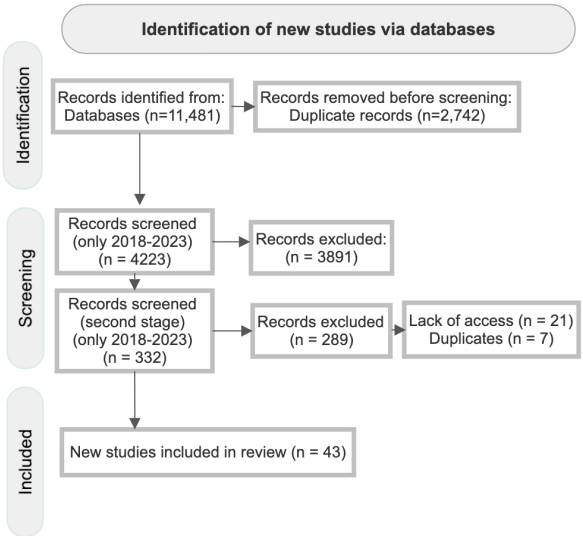

Figure 1. Selection process

Analysis We performed a qualitative analysis of the papers. First, we developed a table with key information for every paper (title, authors, publication, year, topic or RQ, methodology, data generation method, country, and participants). Afterward, we proceeded with text analysis. Codes were developed in an inductive and incremental way. Initially, we used actions or verbs as the unit of analysis, looking for good and bad practices of DT in the public sector and grouping them into codes. We subsequently elaborated themes from the codes representing the actors who perform the practices. We have identified 3 actors: citizens, social workers, and technology. In the next section, we present our findings following a hierarchical division of first actors, and then practices. We have also elaborated on practices performed by multiple actors, blending them into the public encounter theme.

4. Findings

The full list of selected papers and themes identified in each of them is available at this link: Papers list. We selected 43 papers, including 30 journal papers and 13 conference papers. Most articles adopt a qualitative method (33), with only 1 literature review, 4 quantitative studies, 3 mixed methods, and 2 essays. The distribution of the papers in the years is as follows: 9 in 2023, 13 in 2022, 9 in 2021, 5 in 2020, 5 in 2019, and 2 in 2018. Furthermore, 25 studies report from Scandinavian countries, shared among Norway (10), Denmark (8), Finland (5), and Sweden (2), and, including them, a total of 33 papers focus on European countries.

In the following sections, we present the actors who participate in the DT (citizens, social workers, and technology), how they blend in the public encounter, and the main areas to address to perform a socially sustainable DT in the public sector. As we only selected papers published after 2018, these are to be considered preliminary results.

4.1. Citizens

We identified 3 themes concerning the citizens: *Digital divide*, *Shift of responsibility*, and *Administrative literacy*.

Digital divide The most recurrent problem in the digitalization of welfare services is the capability of citizens to access and use technology, called *digital divide*. There are multiple levels of the digital divide, from the ownership of devices to the ability to use them, and it generates many accessibility problems, even in developed countries. Literacy is the first problem to be addressed in less developed countries before dealing with digital skills (Agbeko et al., 2021; Galushi and Malatji, 2022). Moreover, some studies report that people are dependent on a next of kin to access the services as they do not own a device or internet connection (Carswell and De Neve, 2022). In developed countries, people may own the necessary devices, but they might lack the necessary advanced digital skills to access welfare services (Lindgren et al., 2019; Park and Humphry, 2019), and this may also happen among younger generations that are more accustomed to digital technologies (Larsson and Skjolsvik, 2023). The digital divide is interrelated with the socioeconomic status. Consequently, a total digitalization of public services is likely to enforce the exclusion of already marginalized groups, such as low-income people, people with disabilities, immigrants, etc. (Buchert et al., 2023; Hansen et al., 2018; Park and Humphry, 2019; Schou and Pors, 2019). People who do not fit in the system appear as individuals to be "corrected and re-integrated" (Schou and Hjelholt, 2019). Moreover, immigrants potentially face insufficient language skills and missing documents. Studies report that immigrants' lack of language skills can make it impossible to access the services (Rybnikova et al., 2022; Safarov, 2023). The public services use a specific language, so even people with sufficient language skills in everyday life may not understand the terms used in this context (Buchert et al., 2023). Often, automatic translators do not help, and there is no possibility of using English, so they have to rely on help from friends or family (Safarov, 2023). On the other hand, some refugees may lack the required documents to ask for services (Larsson and Skjolsvik, 2023; Martin-Shields et al., 2022). To overcome these

accessibility problems, the government can establish multiple solutions. Governments need to establish help desks, either in public institutions (Allmann and Radu, 2023), or in the welfare centers (Schou and Pors, 2019). Moreover, it is necessary to offer training for those who can develop the necessary digital skills and set up technical support to provide information when needed (Hujran et al., 2023). Finally, systems must be as easy and usable as possible (Allmann and Radu, 2023; Nadav et al., 2021).

Shift of responsibility Digitalizing public services transfers the responsibility for obtaining the service from governmental employees to citizens (Ranerup and Henriksen, 2022; Schou and Hjelholt, 2019). While this is an advantage for some people who do not need to go to the physical office, it may create problems for others. This has several consequences. First of all, digital public services can be accessed 24/7 from everywhere (Hansen et al., 2018; Lindgren et al., 2019), enhancing accessibility for some groups, such as those who cannot exit their house due to illness or cannot go to the welfare office in working hours (Considine et al., 2022; Lindgren et al., 2019). Others prefer digitalized services not to experience the stigma of showing up in the welfare center (Flugge and Holten Møller, 2023; Løberg and Egeland, 2021), or prefer communicating in written form because they find it easier to write about their problems than talk (Aasback, 2022; Løberg and Egeland, 2021). Secondly, digitalized services give the impression of more available public services and allow more frequent communication with social workers (Aasback, 2022; Løberg, 2021). For this reason, digital solutions are usually more efficient, providing a quicker and less time-consuming service for citizens (Hujran et al., 2023; Rybnikova et al., 2022). However, research also points to downsides. For example, some people are very anxious about using digitalized services and have a great fear of making mistakes that can lead to the loss of social benefits that they need (Safarov, 2023; Schou and Hjelholt, 2019), and the lack of confirmation, such as seeing a worker opening the case, creates more anxiety in the waiting time (Skaarup, 2022). Furthermore, people needing assistance in using digital technology feel uncomfortable as they do not "fit in the system" (Schou and Pors, 2019), and the non-digital solutions are usually really slow (Lindgren et al., 2022). Moreover, personal networks play a significant role. Hujran et al. (2023) show that the adoption and satisfaction of e-government services are heavily influenced by the opinions and recommendations of family members, friends, and colleagues and that people are keener to use digitalized services when they see the benefits in doing so and the services themselves are "user-friendly, effortless, understandable and flexible" (p.14). They also suggest setting up a feedback channel for citizens.

Administrative literacy Another concern regarding digital public services is that people do not understand administrative processes even if they can use digital tools (Lindgren et al., 2022; Safarov, 2023). The unfamiliarity with the system is even a greater problem than digital skills for immigrants who do not grow up in the system, and it is difficult for them to look for information on the internet as the information is continuously changing (Buchert et al., 2023; Safarov, 2023). Moreover, when people go to the welfare office to get help, "there is no longer the time or space to help citizens that might not be able to understand particular problems or administrative procedures right away" (Pors and Schou, 2021).

4.2. Social Workers

We identified two themes concerning social workers: *Change of practices* and *Attitudes toward new systems*.

Change of practices The digitalization of public services leads to a change in work practices for social workers. Instead of having mostly meetings with citizens, the predominant tasks are now related to information processing on the computer (Andreetta and Borrelli, 2022; Lindgren et al., 2019). Moreover, their work changed from being specialized counselors to teaching citizens self-service solutions, leaving no time for specialized follow-up of citizens in need (Schou and Pors, 2019). However, some social workers recognized that some citizens could not become digital citizens and performed the requests for them, acting against the policies (Jørgensen and Schou, 2020). Lindgren et al. (2022) explain that when citizens contact the welfare center by phone, workers try to assess the citizen's digital skills level, and depending on that, they either try to push them toward digital solutions or invite them to physical meetings. Andreetta and Borrelli (2022) add that social workers "refuse their role as mere paper-pushing bureaucrats, who ask for documents, fill in forms and templates, and write reports and official notices." (p.10). Rybnikova et al. (2022) observe that DT brought multiple advantages in the daily work: "speeding up communication between employees and supervisors, reducing bureaucracy by simplifying daily activities, reducing the volume of printed materials, and making information more easily accessible for employees and citizens alike" (p.13), as well as time-saving. Moreover, as digital applications have standardized data, it is easier for workers to read and assess the information (Ranerup and Henriksen, 2022). Furthermore, employees can take care of more

requests in the same amount of time (Considine et al., 2022), and the reduction in waiting time increases citizens' satisfaction and enhances the work atmosphere (Kuhlmann and Heuberger, 2023). Digitalization also establishes more standardized rules according to which social workers make decisions because they feel more monitored due to the additional documentation in the system (Hansen et al., 2018). Moreover, standardized systems and practices do not allow personalization in service provision (Andersen, 2022).

Attitudes toward new systems Social workers are positive about using technology when it makes their work more efficient or improves it (Busch et al., 2018). However, not everyone wants to adopt digitalized solutions (Rybnikova et al., 2022; Vogl, 2020). Social workers are afraid to lose their jobs as their performances can be controlled, and low performances can bring penalization (Kuhlmann and Heuberger, 2023). Moreover, Fleischer and Wanckel (2023) noted that digital overload could affect the employees' autonomy in the job, which is crucial for satisfaction. Governmental employees need digital skills and specialized training to be able to use the new systems and learn how to deal properly with citizens' personal data (Nadav et al., 2021; Rybnikova et al., 2022). Social workers reported that it is important to have technical support in case of necessity, that there is a good reason to switch to digitalized practices, and that the system works well, especially from the usability point of view (Nadav et al., 2021). Nadav et al. (2021) explain that workers would appreciate a demo version to try out the system before using it in their real work and a feedback channel where they can communicate with the system providers. Finally, it is necessary to control the increasing workload caused by DT. Citizens expect faster answers and more connection with social workers, which adds a burden on the social workers' side (Aasback, 2022; Løberg, 2021). Moreover, even if sometimes less time is required to deal with the "simple cases", it is difficult for the workers to transfer their time to another task, such as following closely vulnerable citizens (Løberg, 2021) and more different tasks are created (Rybnikova et al., 2022). In some cases, DT even caused an increase in the time necessary to process each case due to more complicated procedures and required documentation (Kuhlmann and Heuberger, 2023).

4.3. Technology: Data and AI

Digitalizing public services allows the collection of a bigger amount of citizens' data compared to pre-digitalization. The availability of these data enables the usage of AI for automated decision-making and streamlining of services. By learning from datasets, AI-based systems can identify patterns and solve complex problems with increased efficiency and quality, without human intervention (Vogl et al., 2019). However, these datasets may be incomplete and can lead to responses being inappropriate or inaccurate, and often also biased towards the majority (Jørgensen, 2023; Park and Humphry, 2019). Most people are not aware of the availability of their personal data (Allmann and Radu, 2023), and social network data may be used to double-check citizens' data by social workers or integrated into datasets and used to make decisions (Hansen et al., 2018; Jørgensen, 2023). Throughout these data, governments can predict citizens' behavior, or citizens can be excluded from services due to the information in the systems, often discriminating against those who are dependent on welfare benefits (Andreetta and Borrelli, 2022; Larsson and Skjolsvik, 2023). Moreover, data are not always handled according to proper privacy rules from welfare agencies as they do not often ask consent to use the data (Andersen, 2022; Jørgensen, 2023), and "suggest that the state may be exempted from the purpose limitation principle, and use data captured from a variety of contexts [...] to perform a legitimate public task" (Jørgensen, 2023, p.10). Jørgensen (2023) suggests that it is necessary to understand when the usage of AI leads to inequalities and discrimination, improve the algorithm to avoid that, and give the citizens the possibility to access their data and see how they are used. The interaction between a citizen and an automated system where an algorithm has made the decision is characterized by an asymmetrical power relationship, as it is difficult for citizens to understand how outputs were created because of the lack of transparency, and how to negotiate the results (Jørgensen, 2023; Lindgren et al., 2019). So, it is mandatory to have explainable and transparent systems (Vogl et al., 2019). Automated systems can be assigned simple and easy tasks and thus leave interesting tasks for frontline workers (Aasback, 2022; Lindgren et al., 2019; Ranerup and Henriksen, 2022). However, the consequences of assigning simple tasks to such systems can lead to higher stress levels for the employees as the remaining tasks for them to solve are the difficult ones (Lindgren et al., 2019). In addition, experts were still needed to control the results of automated decisions on complicated cases (Ranerup and Henriksen, 2022), and in case social workers disagree with the system, there are complicated bureaucratic procedures to change the decision (Vogl, 2020). Nevertheless, automated decision systems can also help provide uniform and standard decisions, augmenting the service quality (Ranerup and

Henriksen, 2022). Moreover, the availability of this amount of data allows for understanding the general trends and helps policymakers and governments in their decision-making (Vogl et al., 2019).

4.4. Public Encounter

The public encounter is the moment of encounter between social workers and citizens. DT introduced the digital public encounter alongside the traditional physical one, bringing technology as the third actor. The digital public encounter can be a video meeting, phone call, or digital chat. Both digital and physical solutions have upsides and downsides. As already said in Section 4.1, digital public encounters have multiple benefits for citizens, allowing them to save time and money, attain faster services, and have impersonal contact without showing up at the welfare center. Digital public encounters can also reduce frontline workers' potential bias derived from seeing the citizen (Flugge and Holten Møller, 2023), while others prefer a physical meeting with a frontline worker who can guide them (Lindgren et al., 2019). Furthermore, even if digital communication may save time for welfare workers, the necessity of much more documentation of every contact with the citizen takes away the gained time (Andersen, 2022; Løberg, 2021), and the information about citizens is much more fragmented (Løberg and Egeland, 2021). However, sometimes frontline workers can manage to document the contact during it, for example, during a phone call, and can also look at the information in the system while on the phone (Flugge and Holten Møller, 2023). Finally, if the encounter is organized as a video meeting, solving technical problems may take longer than talking about the citizen's problems (Flugge and Holten Møller, 2023). Physical meetings allow workers to see the citizens and understand implicit information that citizens may not tell, inferring them from behavior, clothing, and body language, and have a deeper understanding of the situation by combining this information with the one in the documents (Flugge and Holten Møller, 2023; Løberg and Egeland, 2021). Furthermore, it is easier to be sure that the citizen has understood all the administrative information during a physical meeting (Flugge and Holten Møller, 2023), and the workers themselves can use facial expressions to show their understanding or compassion (Løberg and Egeland, 2021). In addition, physical contact allows frontline workers to empathize more with citizens, seeing them as people and not only as names in the system (Løberg and Egeland, 2021; Skaarup, 2022). However, these emotions can affect the way the case is documented (Løberg and Egeland, 2021). As the preference for digital or physical public encounters varies among citizens, the best option is to offer both possibilities and let citizens choose (Flugge and Holten Møller, 2023; Løberg, 2021). Finally, given the increase in digital public encounters, social workers need more training on how to get the information they need even without physically seeing the citizen (Flugge and Holten Møller, 2023; Løberg and Egeland, 2021).

5. Discussion

The findings show that it is necessary to address social sustainability when performing DT in the public sector. This is because DT is significantly reshuffling the interaction between the involved actors. For example, the frontline worker does not deliver the service directly, but citizens increasingly serve themselves through the digital portals provided by the state (Schou and Hjelholt, 2019). In this way, the citizen is supposed to become a digital citizen. Nevertheless, not everyone is able to become a digital citizen: people who are less able to use technology, people with disabilities, and immigrants are often left behind, and governments must ensure that citizens do not lose access to services due to the digitalization (Lindgren et al., 2019). Moreover, on the one hand, citizens need to acquire knowledge about how the administrative system works (Safarov, 2023). On the other hand, social workers have to embrace digital solutions and use them to offer better services, and their work practices need to change accordingly (Schou and Pors, 2019). In addition, their role as specialized counselors must be maintained as people still seek the assistance of an experienced person and cannot be substituted by a machine, because the datasets that machines use cannot take into consideration information such as facial expressions (Ranerup and Henriksen, 2022). Finally, the usage of AI in the public sector offers various opportunities, but it is necessary to ensure that data are collected and used with citizens' consent and utilized to enhance citizens' rights (Jørgensen, 2023).

Based on the findings, we suggest four implications for practitioners and researchers to address the needs of citizens and social workers.

Do not assume that everyone can go digital: some individuals may not be able to use digital solutions, even after training. Thus, providing the possibility of accessing the service in the old way is necessary, and this must be non-stigmatizing. Therefore, it is crucial to ensure that physical encounters remain possible despite the introduction of digital solutions and that citizens can choose the best option. In less developed countries, the focus should be on providing, first literacy and then digital skills, as well as developing the

necessary technical infrastructure, to ensure a successful deployment of digital public services in the future. Our recommendations for research are to involve diverse citizens in participatory studies to understand different needs and focus on developing hybrid solutions that do not exclude anyone. Possible research questions to address are: *How can the public sector embrace technology without replacing non-digital solutions?* or *How does the necessity of hybrid services affect public sector work practices?*

Help citizens embrace digital solutions: governments need to provide adequate support to people who are willing to use digital solutions. First, systems must be as easy as possible to be usable by the greatest number of people. Furthermore, they need to be set up in a way that citizens get confirmation of their actions and updates on the status of their requests. Moreover, governments need to establish training programs for citizens to provide the necessary digital skills, including how to manage their personal data, and administrative literacy. Governments also need to establish help centers for citizens, in the form of welfare offices or other institutions such as public libraries. At the same time, systems should provide remote technical help and a feedback channel. Special support should be provided to immigrants, who face additional challenges due to language and lack of administrative literacy, so multiple language options should be provided, as well as solutions to help them develop administrative literacy. Our suggestions for researchers are to experiment more with participatory design practices involving diverse citizens and try to understand how technology could be used in training citizens. Possible research questions are: *How can a system be designed to better fulfill diverse citizens' needs?* or *How could technology be used to help citizens learn administrative literacy?*

Support social workers: While not all individuals can access or use digital solutions, social workers often function as technical support, which creates new tasks for them. This calls for a rethinking of the tasks for workers to ensure an adequate workload. In addition, social workers need training to acquire the necessary competencies for supporting citizens. Finally, technical support needs to be available for them. Our suggestions for researchers are to be more active in the field, such as using ethnography or similar research methods, to understand the social workers' work practices and how they can evolve in a sustainable way during DT. Possible research questions are: *How can work practices in the public sector be adjusted to empower social workers through DT?* or *What are the best practices for training social workers to ensure that they get the most out of DT?*

Use AI and data to benefit citizens and workers: AI technologies offer many opportunities, but it is important to make sure they do not discriminate against vulnerable populations and use data according to regulations respecting citizens' privacy. In addition, using automated systems for decision-making calls for transparent and explainable solutions for citizens. Implementing technologies based on AI has proved to help automate easy tasks, thus contributing to releasing resources for social workers. However, it is still necessary to have social workers handle the more difficult and complex cases, understanding that AI is a tool that can support decision-making, but not substitute the human component. From a research point of view, there is a need for a deeper understanding of how AI can be used to benefit the public sector, augmenting citizens' possibilities and supporting social workers in the best way. Therefore, possible research questions are: *How can the public sector embrace the new AI technology with benefits for citizens?* or *How can social workers deal with the new AI technologies?*

In conclusion, we define a *socially sustainable DT in the public sector* as a process that embraces technologies to simultaneously: 1) Generate better services for citizens to avoid marginalization of vulnerable groups, respect data regulations, support citizens, and know that not everyone can go digital; 2) Empower social workers, giving them tools to support decision making and deal with the cases, without substituting them with machines or increasing their workload.

6. Conclusion

This study is only a preliminary outcome for a more extensive literature review project and shows preliminary findings analyzing only papers from and including 2018. We selected and analyzed 43 papers, provided 4 implications for practitioners and researchers, and a preliminary definition of socially sustainable DT in the public sector. Findings also show a gap in the IS literature on the topic, as none of the papers comes from IS journals. However, it is promising that most studies are based on qualitative methods and thus provide in-depth insight into DT processes in different public sector contexts. Nevertheless, we push IS scholars to embrace the topic more systematically. The main limitation of this study is that we considered only papers published from 2018, potentially excluding some important studies published before. We will address this limitation in a complete and more extensive study that we are performing. In addition, the papers report mostly from Scandinavian countries. This was expected, as these countries lead the way

in the digitalization of the public sector and social sustainability. The results, and hence the suggested implications, might not represent countries outside of Scandinavia. Furthermore, researchers should take example and start investigating the DT impact on social sustainability in other countries.

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