

*Presented at the 16th Scandinavian Workshop on e-Government, January 30-31, 2019,
University of South-Eastern Norway (USN). Work in progress not to be cited.*

Robot takeover? Analyzing human and technological agency in automated decision-making in social services

Agneta Ranerup

Department of applied IT, University of Gothenburg, agneta.ranerup@ait.gu.se

&

Helle Zinner Henriksen

Department of Digitalization, Copenhagen Business School, hzh.digi@cbs.dk

Abstract

This article analyzes human and technological agency in an innovative case of automated decision-making in social services. The research questions are: 1) How does professional, citizen and technological agency appear in routines with digitalization and automated decision-making in social services? 2) How can this layout of human and technological agency be characterized in terms of digital discretion and its aspired values and desired effects? A first conclusion is that human and technological agency appear in form of a repertoire of civil servants and technologies interacting with clients. A second conclusion is that many aspects of Ethical, Democratic and Professional discretion are relevant in digitalization and automated decision-making in social services. However, our tentative analysis indicates that in spite of civil servant participation in development and case-handling, the parts where they have a strong position in terms of digital discretion are somewhat reduced or changed through the technological development.

1 Introduction

Digitalization in form of a somewhat futuristic view of automated decision-making or “robotization” is gradually increasing in importance in the digitalization of public sector (Wirtz, Weyerer & Geyer, 2018). This later form of development, including active promotion by powerful political and administrative agencies (SALAR, 2018b), has a potential of enabling improved services for citizens. This development influences citizens’ encounter (Goodsell, 1981) with public services in the sense that it is not only a meeting with face-to-face interaction (cf., Hansen, Lundberg, Syltevik, 2018; Lipsky, 2010). Even more important, it changes the understanding of public sector decision-making as made up by an independent civil servant with a certain degree of discretion and transparency regarding the content of the process of making decisions (Lipsky, 2010; Tummers & Bekkers, 2014). The focus of this paper is on the content of the interaction between people (civil servants/professionals, citizens/clients) and technology (digital and automated routines), in an attempt to highlight the digital discretion (Busch & Henriksen, 2018) and agency of both (Callon, 1986; Mwenya & Brown, 2017). The empirical

context for our symmetrical analysis is automated decision-making in social services in a Swedish municipality, featuring as an instance of public service (Ranerup, 2007).

Research into digitalization of social services emphasizes a difference between technology and the encounter between the civil servant (“the professional”) and clients. In 2008, Laurent discussed the introduction of IT in the Belgian social services, suggesting the presence of two logics; “the logic of computerization” and the “logics of social work”, to be important. She concluded that computerization fits well with a professional identity associated with efficiency, and less well with proximity and personalization. A number of more recent studies explore the dichotomy technology-human in more detail. Examples include, De Witte, Declercq & Hermans (2016) who define “two worlds” in social work; one being the world of the database, the other the face-to-face interaction where the relational and narrative way of working is preserved. Another focus is on the *de facto* content of digitalization and use of technology in specific situations (Goldkind, Wolf & Jones, 2016). They found that the technologies supporting the traditional work tasks more effectively was more common than technology supporting new forms of interaction. Other studies in the area of social services have focused on the introduction of technological platforms for documentation of the management process in child and social welfare (Devlieghere, Bradt & Roose, 2017; Devlieghere & Roose, 2018). Standardized processes of technological platforms can be good for transparency, but pitfalls exist such as that the style of writing might be influenced in a negative way due to the limited vocabulary that can be used in the systems (Devlieghere, Bradt & Roose, 2017; Devlieghere & Roose, 2018). The outcome of massive investments in technology might be that communication with clients using face-to-face encounters will still be a popular option (Hansen et al., 2018). This might also be seen as an evidence for the option of preserving the meeting between professionals and clients, that often are seen as central aspect of social services (De Witte et al., 2016). A recent systematic literature review characterized social services as a context where civil servants’ discretionary practices to a lesser degree are influenced by technology (Busch & Henriksen, 2018).

The most recent technological focus in public sector is on digitalization, automated decision-making and Artificial Intelligence. In their systematic literature review of Artificial Intelligence (AI) in the public sector (Wirtz et al., 2018) distinguished between two types of AI: one more advanced and another more limited. This later, more limited type of AI includes for example structured programming or automation of decisions. It is often denominated as Robotic Process Automation (RPA) (Willcocks, Lacity, and Craig, 2017). The RPA is the primary technology in our study of an innovative case in social services. Wirtz et al. (2018) brought forward a number of challenges with AI, as for example the responsibility for decisions made by the technology, discrimination in decisions, as well as larger effects by technology use such as workforce substitution and transformation. Very recently, the Swedish national agency for local government administrations (SALAR, 2018b) promoted the dissemination of automated decision-making in form of RPA. They did so due to its’ claimed advantages of saving labour to be used for what was characterized as more important purposes.

Previous empirical studies of automated decision-making have included empirical studies of civil servants and citizens: Wihlborg et al. (2016) treated the influence of more direct automated decision-making on civil servants in national public agencies in Sweden. With reference to issues of legitimacy and professional competence, they suggested that civil servants can either make an alliance with the automated system or with the citizen. A case study of a juridical court problematized the role of contextual factors as for example skills and environment of the involved professionals (judges), but also the influence of the technology in use on the ability to exercise discretion (Busch, 2017). In contrast, a study on “automation” in the management of unemployment insurance in the US suggested that less personal interaction through the use of technology might result in reduction of biases towards clients due to the reduction in human involvement (Wenger & Wilkins, 2008). From a citizen’s viewpoint the transparency regarding the algorithms used in public sector applications is important (Brauneis & Goodman, 2017). This is especially so if the principles of openness, impartiality, equal treatment and predictability (Christensen & Lægred, 2018) are to be maintained in public sector agencies applying automated decision-making.

In sum, there is previous research with a focus on automated decision-making, discretion and digitalization in general as well as in social work. However, there is a lack of closer studies of the interaction between humans represented by civil servants and citizens/clients as well as technology in case-handling in social work. The empirical context of this study is case-handling in social services with a focus on decisions about social assistance (e.g., economic support under the Social Services Act). Our contribution will be to explore this gap in form of a symmetrical (Callon, 1986) study and analysis of human and technological agency in case-handling in social services specifically asking the following two questions:

- 1) How does professional, citizen and technological agency appear in routines with digitalization and automated decision-making in social services?
- 2) How can this layout of human and technological agency be characterized in terms of digital discretion and its aspired values and desired effects?

The remainder of this article is organized as follows: Section 2 provides an overview of our theoretical framework. The principle of symmetry is presented along with agency as it is outlined in the Actor Network Theory (ANT). Section 3 presents the concept of digital discretion which plays a central role in the understanding in the shifts caused by the introduction of RPA in social services. Section 4 introduces our case context and presents the data-collection process. Section 5 contains the data analysis in three steps: 5.1 offers an overview of the “macro actors” or agencies that make up the context of the case-handling process in our empirical case. Section 5.2 offers a symmetrical account of the case-handling process, whereas section 5.3 further discuss its’ details based on theories of discretion with an emphasis on digital discretion. Section 6 contains conclusions, limitations and issues for further research.

2 A symmetrical view of humans and technology

We apply Actor Network Theory (ANT) and its’ concepts of generalized symmetry (Callon, 1986), as well as human and technological agency, as means of establishing a relevant *focus in our*

analysis. We further apply the concept of discretion as a relevant *aspect* in our analysis of case-handling in decisions about social assistance. Very briefly put, ANT emanates from Science & Technology Studies (STS) in the 1980s (cf., Latour & Wolgar, 1986). It has been used in many disciplines and research fields including organizational science Czarniawska & Hernes, 2005a), information systems (Lyytinen & Newman, 2015; Walsham & Sahay, 1999) and e-Government (cf., Heeks & Stanforth, 2007).

ANT contains a repertoire of concepts, often related to what is denominated as “translation processes” during which sociotechnical networks at various levels are negotiated and put together. In such processes ANT emphasizes the importance of humans as well as non-humans (“artefacts”) as capable of acting on behalf of humans and thus having “agency” (Caronia & Mortari, 2015). The fundamental principle is the “symmetry” between human and non-human actors (Callon, 1986; Latour, 2005). In this manner in an analysis symmetry and agency, we are encouraged to focus on not only humans but also non-human actors such as information systems and their agency or capacity to act or speak on behalf of something else. This means that information systems are not “black-boxed” or ignored as to their specific characteristics and roles, something which an oft-cited review claims to be (too) common in IS-research (Orlikowski & Iacono, 2001). Paradoxically, a recent literature review of studies using ANT found that the level of identifying, analyzing and documenting non-human (“technological”) actors varies greatly (Mwenya & Brown, 2017). Only a small fraction can be said to “take technology seriously” (Monteiro & Hanseth, 1996) in the sense that it is analyzed as an actor in a more elaborate way. In line with this analysis and theoretical view, ANT not only contains the principle of symmetry of human and non-human. An important principle is also that the researcher is free to choose his/her level of analysis (Knights & Noble, 1997). This is as long as the fundamental and classic rule in ANT about to “follow the actors” is applied (Callon, 1986; Latour, 2005).

Walsham & Sahay (1999) is brought forward by Mwenya (et al., 2017) as a study that documents and discusses actions of non-human actors. More specifically, Walsham and Sahay discuss how hardware, software and data in an Indian GIS system is inscribed with, or represent, Western values and logics rather than local ones. Still, we argue, the technological actor did not appear in forms that offer a very close significant descriptive detail. A study within the research field of e-Government, Ranerup (2007) applied the principle of symmetry in a close analysis of computerized decision-support aimed to improve citizens’ choice of funds in public pension. The target of analysis was the actions of technology, humans and their joint “hybrid” agency as perceived on the screen and from interviews with potential users. They were featured as “micro-actors” in relation to the national public agency the “macro-actor” (Czarniawska & Hernes, 2005b) and its’ policy of improving citizens choice of pension funds

During the years, ANT has been criticized for being too descriptive and non-theoretical as well as ignoring the human responsibility for technology through the symmetrical study of agency (Suchman, 2003; Walsham, 1997). Thus, the decisive principle of generalized symmetry can be criticized. The concept of agency also appears, associated with more or less controversy, in a broader social science tradition focusing on human agency only (Lundberg, 2018). However, it

can also be questioned how the non-human actor is studied empirically or “given a voice”. The question is how it is studied or followed as an actor from a methodological point of view, without letting the humans being the one and only “voice” to speak on their behalf (Mwenya & Brown, 2017; Pouloudi & Whitley, 2000). Despite this critique, its’ proponents many times apply it as we do here; in combination with other theoretical frameworks. This in order to attain a rich and well-grounded understanding of technology use of today, with a special emphasis on offering a view the technology as such in joint or hybrid relationships with humans (cf., Lyytinen & Newman, 2015; Ranerup, 2007; Walsham & Sahay, 1999). Thus, ANT in our study is a theoretical perspective that improves the understanding nuances in e-Government projects (Fornazin & Joia, 2016) in form of case-handling in decisions about social assistance.

3 Digital discretion in e-Government

The theoretical concept of “discretion” can be summarized as; the freedom or right civil servants have in decision-making in line with public laws and regulations (Dworkin, 2013). This freedom includes a positive component in form of decisions about rewards and rights of the individual. It also involves a more negative component in form of decisions about type and quantity of sanctions (Lipsky, 2010; Tummers & Beckers, 2014). In contrast, the concept of “digital discretion” refers to the new situation of civil servants and their relations to citizens in Digital Era Governance (Dunleavy et al., 2006). Digital discretion is made up of various aspects of this new paradigm focusing on how technology influences discretion by suggesting decision alternatives, limiting alternatives, providing relevant information, and perhaps even removes humans in decision-making (Busch & Henriksen, 2018). In this manner, the freedom of civil servants in decision-making and their relation to citizens are affected in various ways.

In a systematic literature review Busch & Henriksen (2018) studied articles focusing on aspects of street-level bureaucracy and discretion combined with information technologies (n=44). The review was organized around an established framework of public values, including Ethical values, Democratic values, Professional values and Peoples values (Kernaghan, 2003). In this endeavor, the societal problem treated, the purpose of using IT and the desired effect of using IT were sought after (Busch & Henriksen, 2018). Sixteen possible constellations were identified in relation to the four categories of values.

In Table 1 we have distilled 10 relevant constellations of societal problems, purpose of using IT and the desired effect that we find are sufficiently detailed to serve as an additional analytical framework in the study of RPA in social services. The definition of discretion defined above (Lipsky, 2010; Tummers & Beckers, 2014) combined with the 10 constellations (see Table 1), will be used in the second stage of our symmetrical analysis of humans and technology in case-handling in social services. Digital discretion is, of course, a concept that first and foremost refers to the capacities of civil servants. For a recent study of civil servants’ attitudes towards discretionary practices see; Busch, Henriksen & Sæbø (2018). Nevertheless, our close symmetrical analysis enables an analysis where not only civil servants can be studied. As a result of the specific situational layout of technology, its’ purpose and use by humans, as well as desired effects, the more “indirect” effect on citizens can also be discussed.

Table 1: Theoretical framework: Connecting values and aspects of digital discretion.

Societal problem	Purpose of IT	Desired effects
<i>Ethical public service values:</i> Unethical actions and corruption	Reveal reasoning behind decisions	To avoid unethical actions and corruption
Wrong decisions due to different interpretations of rules and personal factors	Enforce adherence to rules and procedures	Fair and uniform decision-making
<i>Democratic public service values:</i> Reduced acceptance of authority	Reveal reasoning and actions made by government	Increased political legitimacy
Wrong assessment of cases	Allow citizens to participate in decision-making processes	Empower citizens
Reduced adherence to rules and procedures	Enforce adherence to rules and procedures	Increased accountability
<i>Professional public service values:</i> Insufficient or incorrect information	Information processing	Increased quality of decisions
Erroneous assessments by street-level bureaucrats	Reveal reasoning and actions by street-level bureaucrats	Prevent errors
Discretion is costly and inefficient	Faster decision-making	Increased efficiency
Discretion is costly and inefficient	Empower unqualified street-level bureaucrats	Reduced costs
Erroneous and inefficient decision-making	Change work processes	Increased efficiency and quality of decision-making

4 Methods

4.1 Case

This is a qualitative interpretive study (Walsham, 2006) of an innovative case where digitalization and “robotization” are introduced in social services in a Swedish municipality. The case as such is of special interest representing the very first municipality where decisions about social assistance are digitalized and automated (Svensson & Larsson, 2017; SALAR, 2018b) in Sweden. The model, denominated as the “Trelleborg-model” has, during the last few years, been highlighted in various contexts such as innovation competitions and through a multitude of local and national seminars. Recent examples are a seminar in October 2018 at a national conference with a theme of “Lean processes” and a seminar in November 2018 organised by the Swedish Agency for Local Authorities and Regions (SALAR) dedicated to promoting RPA in social services. Here, recent experiences from the municipality and a dissemination project were communicated to managers and politicians with the intension to implement the model.

However, the model has received negative publicity through critique by social workers in the debate, as well as in some empirical cases where it has been introduced (Persson, 2018). In this study it has been selected as an innovative case, that might contribute with insights of importance to e-Government in general.

4.2 Data

The empirical data in this study consists of qualitative interviews (45-60 minutes) with two leading politicians, three leading civil servants and two caseworkers at the Labour market agency in the municipality, working with issues related to social welfare and the decision-making in relation to case-handling in social assistance (September-November 2017). Follow up interviews were performed in October 2018 with one of these leading civil servants and two caseworkers. The interviews were recorded and subsequently transcribed.

In the interviews, open-ended questions were asked with a focus on the pre-history, origins and layout of the current model by which social assistance are managed and the design of the technology herein. For the majority of interviewees with relevant experiences, detailed questions about the content of the case-handling were asked in order to uncover the details of human and technological agency. The intention was to unravel what the clients, the caseworkers of different kinds, as well as the digital and automated routines did or could do. The majority of questions were about the current layout, whereas a few questions treated the pre-history or future layout of the case-handling model. In this manner, the intention was to capture the layout of human and technological agency, as well as any changes in the near future.

A further type of data is in form of internal reports (ten instances) from the Labour market agency 2014-2018 describing the political intensions and the result. We also used outward-looking reports about the intention with the current model by which to manage social assistance (four instances) and information on the municipality's webpage for people in need who want to apply for help. Another type of data was oral and PPT-presentations produced by civil servants presenting the digitalization being a part of this. Yet another form of data was oral presentations of the experiences from the seminars in October and November 2018 as described above. A last type of data was examinations of instructions about how to apply for social assistance provided on the municipal website as well as a tentative walk-through of the digital routine for applications. Triangulation of data was used as a method to strengthen the validity of result (Easterby-Smith et al., 2002). In practice, this means that the account in 5.2 was constructed based on all the available sources to enable the richest possible account. However, almost all types of data emanate from agencies within the municipality in contrast to external agencies. Our account is made without being an ethnographic or otherwise study of actual users' activities (cf., Madsen & Kræmmegaard, 2015).

4.3 Analysis

Our analytical focus is twofold: One focus is on making a shorter overview of actors and intensions at a national level (lawmakers, SALAR) and local level (the Labor Market Agency in the municipality and local politicians). Both feature as "macro-actors" (Czarniawska, 2005b) in

our case, serving as an important context to the details of the case-handling model. However, our more direct symmetrical (Callon, 1986; Mwenya & Brown, 2017), analytical focus is on the content of the direct interaction between human actors (civil servants, citizens) and technological actors (digital and automated routines) in case-handling in social assistance. Here, an account is made of what the different types of human and technological actors *do* in the case-handling process; from the application for social assistance to the actual decision and how it is communicated. As a second step, the details of discretion with a special reference to aspects (Table 1) of digital discretion (cf., Busch & Henriksen, 2018) from the perspective of civil servants and citizens/clients in the previous account are discussed. Brief comparisons are made with previous and future technological arrangements.

In our symmetrical account, the agency of humans (case-workers, citizens) were represented (Mwenya & Brown, 2017; Pouloudi & Whitley, 2000) by data from all types of interviewees, the internal and external reports, and other forms of verbal external communication. The agency of technology was represented by instructions on the municipal website, researchers' walk-through of the application process, as well as interviews with certain managers and case-workers with more specific knowledge.

5 Findings

5.1 An overview of macro-actors

In this section a brief overview of the macro-actors will be given, featuring as a background and context to the more detailed account in 5.2. In their capacity of passing laws the *national parliament* in Sweden is a central macro-actor. The Parliament passed a Social Services Act (Ministry of Health and Social Affairs, 2001) which regulates the processes in case-handling of social assistance. The fundamental principles of the Social Services Act (Chapter 1, §1) are that the law as a whole shall "strengthen the economic and social safety, equal opportunities and active participation in society". The individual's resources and responsibilities are emphasized. At the same time, social assistance is a help and support that the individual shall receive only during short periods. Equally important, social assistance shall be an option when the more regular forms of economic support are unavailable or too limited to meet the individual's need. The individual's obligations and rights are described as follows:

In order to be eligible to receive social assistance, an individual must do what he or she can to support himself, among other things to look for work. [...] Social assistance is made up of two parts: one is in form of a norm that applies to the whole country (the national norm), the other is in form of reasonable compensation for costs for a number of other needs (The National Swedish Board of Health and Welfare, 2013, p. 20)

In practice, this means that an individual citizen can apply for social assistance to an agency at the municipal level. Normally this agency is organized as a Social Services Center, whereas less often it is organized as an agency that looks after the case-handling of social assistance combined with labor market issues. In the Trelleborg-case, it is the *Labor Market Agency* that manages the case-handling. At the national level, SALAR runs a *technological Platform* which provides the necessary information to professionals working with applications for social assistance about social benefits that an individual client is entitled to receive. The platform

provides information about the client and shows if he or she already has sufficient economic support in form of for example pension, study allowance, unemployment benefit, as well regular incomes etcetera. This Platform is used by 90% of the municipalities (SALAR, 2018a).

During the last few years, the Labor Market Agency in Trelleborg and its' political leaders have launched a model for managing social assistance, denominated as the "Trelleborg-model". A central feature of this model is that it is considered important that the individual client gets a decision in a few days. Therefore, the application process has been streamlined and contains a *routine for digital applications*. Equally important, the "management model" and the application process focuses on interacting with the client about in which steps she/he should take towards becoming self-supporting (Trelleborg municipality, 2015b). These activities are an obligatory part of the process. Parts of the application process is handled by RPA in form of a *routine for automated decision-making* that was introduced by the Labor Market Agency in the spring of 2017. A report from the autumn of 2017 put forward a goal that 85% of the digital applications for social assistance will be handled by the RPA (Trelleborg municipality, 2017). The RPA thus acts in line with ambitions stipulated by the Labor Market Agency.

5.2 A symmetrical account of the case-handling process for social assistance

The following section contains an account of the application process for social-assistance and the expected activities from the side of humans. There is an account of the digital and manual application process (5.2.1), the process where the at least partly automated decision is made (5.2.2) and the process in the event of a negative decision when the client want to file an appeal to change the previous decision (5.2.3). Lastly, a brief overview of the regular activities is given in case an applicant has a long-term need of social assistance (5.2.4).

5.2.1 Applying for social assistance

Citizen (H): When a citizen needs to apply for social assistance he/she looks up the municipal website and its' section for digital self-services. One of these services is the Platform for applications for social assistance. Here a citizen can submit applications from home or any other place. The citizen applies for social assistance by logging in, using eID (Bank-ID). A manager explains how this was handled when this service was introduced in 2015: "And when we started, we had a person at the helpdesk that assisted in ordering Bank-IDs in connection with the applications". [Manager No. 1, September 26, 2017]

Platform for applications (T): The types of information about his/her family-members, incomes and different personal expenses like rent, broadband, medicine, childcare, home-assurance etcetera that must be part of the application are shown. Clicking on a question-mark provides additional information about the legal norms for these benefits. There are instructions in Swedish, English and Arabic, but the application can only be written in Swedish.

Citizen (H): The client provides information about their economic situation as above. However, as explained by a politician, providing for example proof of payments is not necessary in this application process:

You had to send in a lot of documents, that might for example be copies of statements of bank accounts [...] Now instead, we have trust in the individual. We believe that people want to do their very best. [Politician No. 2, September 25, 2017]

Instead, the accountability is safeguarded by regular check-ups:

Normally, we make a check-up of every 10th application. [In the event that all applications are controlled] all clients must send in their documents, which is why the decision-process [might be] longer than normal. [Manager No. 2, Labour market agency, September 26, 2017]

In all, 75% percent of the applications are made through this digital Platform (Trelleborg, 2017). Further, if it is the first time a citizen applies for social assistance; denominated as a "New application", he/she must provide additional information. A caseworker explains:

[T]he client must provide a few more types of information [...] Here, you provide information about where you live, if you are in a possession of a contract for your private home, how many people live there and so on. [Caseworker working with social assistance, October 9, 2018]

In future, further documentation might become a mandatory part of the application:

When you make a New application, there is the idea that you should attach a document in form of a contract for your lodgings or an invoice for your rent. [...] It has to do with the ambition to improve the control function. [...] Because we can see that it is not always that people can provide the formal contract showing their rent. [Manager No. 1, October 9, 2018]

Platform for applications (T): The Platform registers the provided information. As a second step, it suggests a range of times the next day for an appointment with a caseworker working with labor market issues.

Citizen (H): The citizen chooses a time for this appointment and finishes this part of the process.

Alternatively:

Citizen (H): A citizen is unable to make an application by him/herself and therefore goes to the helpdesk at the City Hall. Here, the citizen gets help with the digital application or with the traditional paper type. This help is offered by the civil servants with an academic degree and a special competence in the area. However, the number of people seeking help at the helpdesk is gradually diminishing:

But in the beginning, when we introduced the e-application, there was some resistance among the older clients that weren't so experienced with using computers. Some people were also unsecure about how it worked, and what you were supposed to write. But the more often they do it, the more they learn about how it works. [Civil servant at the helpdesk, October 9 2018]

Civil servant at the helpdesk (H): This civil servant offers help with the application due to, for example language problems, as well as "a feeling of being unsecure about what to write, and [because of this] write something that is wrong". [Civil servant at the helpdesk, October 9 2018]

Platform for applications (T): The technology asks for information and suggests a time for an appointment as above.

Citizen (H): The citizen chooses a time for this appointment and finishes this part of the process.

Application continued:

Citizen (H): The citizen goes to the inaugurate meeting with the caseworker.

Caseworker working with labour market issues (H):

It has two parts; the first part is that we must judge what this person has done to get an income and here we look at if he/she is registered at the unemployment agency, has applied for jobs and has a CV. [...] We try to keep this part as short as possible. Then, we try to focus on how to get a job. We try to base this part on the individual, their plans and needs. [Caseworker working with labor market issues, November 29, 2017]

The caseworker asks about the current situation, makes up an agreement about future activities, and how they will be followed-up on a regular basis. In the very early phases of the introduction of the new management model, a few caseworkers were somewhat critical about that the case-handling was transferred to the Labor Market Agency. A politician explains:

There were some caseworkers who thought that case management should be handled by social services. It should not be handled by the Labor Market Agency. [...] and this was true among some professionals [in social services]. But I think that it didn't affect our activities here.

[Politician No. 2, September 26, 2017]

Citizen (C): The citizen answers these questions and discusses alternative actions.

Caseworker working with labor market issues: He/she goes through the questions and issues that are needed and makes up a plan for further activities together with the client. As explained by a politician: “[B]ut perhaps it is so that not everyone wants the plan that you get [about becoming active in the labour market], but you get it anyhow.” [Politician No. 1, September 26 2017] A manager continues:

Yes, but the digital services are one thing, but in this model of working the clients have more possibilities to express their cause [...] through meeting a labour market secretary several times a week instead of a social worker once a month, talking about your application. So, as a citizen you get more possibilities to influence your plan and your goals as well. [Manager No. 1, October 9, 2018]

Lastly, the caseworker finishes the plan and provides it on paper to the client.

Platform for applications, the separate Routine for decisions (T): In the Platform there is now information about an active plan and how it should be followed-up on a regular basis.

5.2.2 Decision about social assistance

Platform for applications, the separate Routine for decisions (T): The routine goes through the application regarding the client's economic situation and activities in the plan. A manager explains:

The robot is programmed as a caseworker. A caseworker has been filmed and then this has been incorporated into the robot. [...] Well, it is the application form that is copied, the robot logs into our case management system ProCapita as a caseworker, copies the information from the form as a caseworker would do, and transfers them to an Excel document to make a check-up with the Social Insurance Board and the like [ie., the national Platform]. And then, the calculation is performed leading to the final decision. [Manager No. 1, Labour market agency, September 26, 2017]

A specific focus in the decision is on the “activity plan”:

Yes, the robot makes a check-up if you have an operational activity plan. If there is no such plan, we say that the activity plan is broken or there are no dates for check-ups. And then the decision is negative. [Caseworker working with labour market issues, November 29, 2017]

However; “If a person is unable to work, they must provide a certificate. [...] [T]hey might be in contact with the clinic for drug addiction or whatever it might be.” [Caseworker working with labor market issues, November 29, 2017] There is a specific caseworker that is dedicated to helping people in need with this kind of forms etcetera. The routine generates a decision that can be positive, partly positive or negative.

Platform for providing information about social benefits (T): Some of the information of relevance to his/her economic situation about benefits like study allowances and pension comes from a national Platform (see Section 5.1).

Platform for applications, the separate Routine for decisions (T): The part of the routine treating negative decisions is far more complex and is not fully developed at present. A manager describes:

So now we are designing the functions for negative decisions. It is a bit more complicated [...] but you can get a partly negative decision regarding two or three things that you apply for, a situation that the robot is unable to handle as yet. But here we are in the process of programming. [Manager No. 2, Labour market agency, September 26, 2017]

Texts and algorithms associated with the different negative outcomes have recently (in July 2018) been created: “Now we have come to the point that the robot can make negative decisions. And then we have made up sophisticated templates that can be selected when, for example, the activity plan is missing. [Caseworker working with social assistance October 9, 2018]. She continues: “Yes, I have formulated this text. Then we have two colleges that are skilled in technology issues [...] that have put it in the right place and in the right format”.

A manager describes the development:

A positive decision is much easier to program. Negative decisions are much more complex. One might get a partly negative decision regarding something that should be a positive decision. There is a large repertoire of motivations for negative decisions. So our work is about to be so much clearer about our

motivations, so they are adequate. And then about the rules of the robot for what decision to choose. [Manager No. 1, October 9, 2018]

Caseworker working with social assistance (H): Regarding some negative decisions, a caseworker must take a closer look and make a decision that is written into the technological Platform. A caseworker describes their situation:

The advantage with working in this administrative manner [...] is that you are not influenced by feelings. [...] Here, we can make something more neutral; a judgement based on the rules and regulations and what our work is based on. We have laws that we must follow. So, you can concentrate on that, instead of if people are sad, angry or threatening. [Caseworker working with social assistance, October 9, 2018]

Citizens, caseworkers, and technological routines (H, T, "Hybrid"): The final decision is thus based on the joint, "hybrid" actions of humans and technologies. This relationship can be described as follows:

Because the judgment of whether you are willing to be active in the labour market is based on the meeting [between citizens and caseworkers]. [...] So, when the formal decision is made, this is based on the judgement made by the contact with the human caseworker [Manager No. 1, Labour market agency, September 26, 2017]

Before the new management model a decision took approximately 8 days. After some time, but before the digitalization, in December 2014 a decision took one day (Trelleborg municipality, 2015a). A caseworker explains her new role:

No, I don't think that we have lost something. It is always a caseworker that stands behind a decision about an application. One can never say that a robot does that. [...] We have not lost our discretionary power. On the contrary, we are more qualified since we have improved our capacity to make judgements concerning what is reasonable. [Caseworker working with social assistance, October 29, 2017]

She continues:

Well, I think that I can use my knowledge where it is really needed. [...] The difference is that one can spend the time on expert opinions, appeals and investigations of client's debts related to rents [...]. Here your competence is needed. [Caseworker working with social assistance, October 9 2018]

In contrast to fully automated decision-making, it is argued that human competence is still needed in the process: "A strategy of automation of 80% or 100%? [We should] preserve competence in the areas we have automated." (Director of company working with the automation, Conference with focus on automated decision-making, October 6 2017).

Platform for applications (T): The Platform receives the decision from the separate routine. A SMS and an e-mail are sent to the client. Information about how to appeal against the decision is provided in the decision and in the Platform:

The positive decisions are quite brief, it is the negative decisions that [requires further motivations]. If you have applied for rent and electricity and got a positive decision, there is not much to write. [...] If you have got a negative decision

concerning the electricity bill, it might be the dates on the bill that were wrong. [...] Yes, we have spent very much time on trying to simplify, which is why we have formulated many templates and this makes the whole thing more equivalent. [Caseworker working with social assistance, October 29, 2017]

Citizen (H): The citizen can log on to his/her account in the Platform and read the decision. In case of a negative decision, he/she can decide about if to appeal or not. In the former case, he/she can go to the helpdesk or manage the process independently.

5.2.3 Appeal against decisions

Citizen (H): A citizen can choose to appeal against a decision, but sometimes needs help. A civil servant describes: "We often feel that people would like us to formulate their appeal. And that they feel that this makes it easier for them to succeed in their appeal or something." [Civil servant at the helpdesk, October 9, 2018]

Civil servant at the helpdesk (H): There is a template when a client wants to appeal against a negative decision. A civil servant explains:

Yes, we print it so that they really understand what the negative decision was all about. And so they understand what they want to appeal against. [...] So absolutely, we explain what it is all about, but we don't write. If the appeal is not successful, this should not be something that we can be held responsible for. [Civil servant at the helpdesk, October 9, 2018]

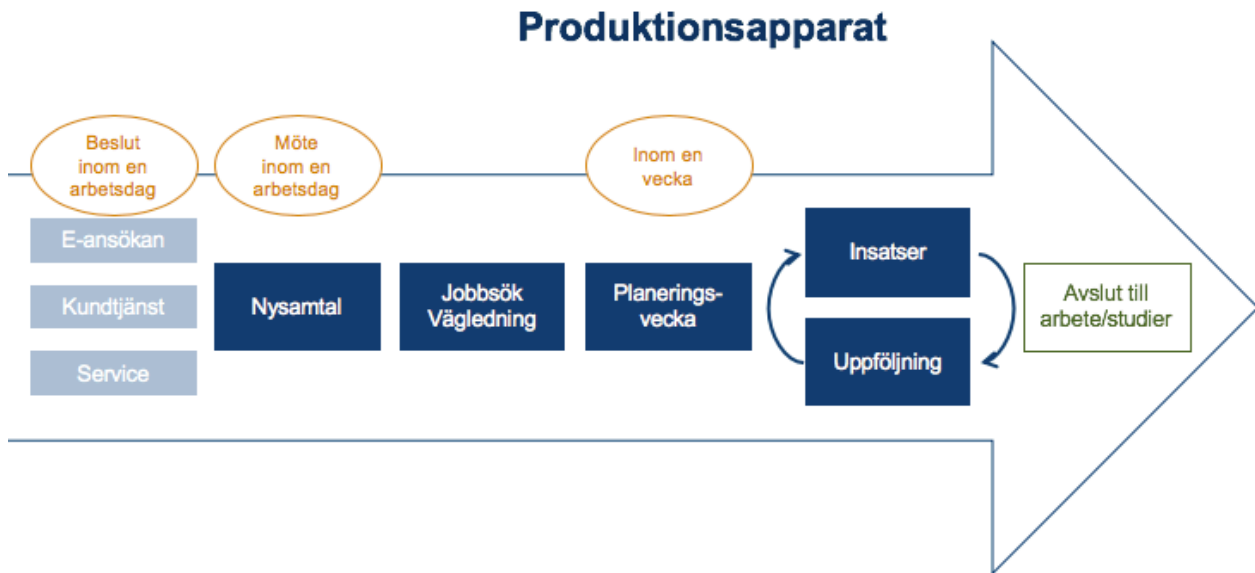
The appeal is submitted and treated manually by caseworkers working with social assistance.

Platform for applications (T): In current technology development, a function to file an appeal against decisions will be introduced. "[O]ne has the option to appeal through an e-service instead of paper. And then, an additional function is that you can attach documentation about the things that you want to use in the appeal." [Manager No. 1, October 9, 2018]

5.2.4 Regular activities in the management of applications

Caseworkers at the Open house, labor market secretaries and citizens (H): For all clients, there are regular "Open houses" with caseworkers providing help with preparing job interviews, formulating job applications and contact with employers that are in the process of recruiting etcetera. There are also shorter meetings between clients and labor market secretaries when he or she must apply for social assistance during an extended period. The process as a whole is summarized in a presentation by manager no. 3, Oct 17th 2018 (see Figure 1) as a "Production process" involving a *decision* and a *meeting* after a maximum of one day, a *week with activities* focusing on careers advice and help with applying for jobs, as well as a period of activities and *follow-up meetings* in case of longer periods when clients need social assistance. The end of process is described as "Education/Work". Further, recent reports show that the number of people that has become self-supporting and the costs for social assistance indicate a positive trend (Trelleborg municipality, 2017)

Figure 1 The “Production process”



5.3 An analysis of the case-handling process

5.3.1 Actors in the management of applications

Our case includes macro-actors (Czarniawska & Hernes, 2005b) like lawmakers, local managers and politicians as well as a national technological Platform designed to check social benefits. In addition, at the local level there is a repertoire of human micro-actors, such as caseworkers working with labour market issues, social services and clients. Technological micro-actors are the Platform for making applications, the local version of the technological macro-actor for checking benefits, the routine for writing activity plans that will be introduced in the Platform for applications and the separate, partly automated routine for decisions about social assistance. This establishes the *hybrid* (Ranerup, 2007) decision-maker as the central arrangement.

In addition, there is a complementary repertoire of humans in form of caseworkers at the helpdesk. These actors will be complemented by technological agency in form of a developed Platform for applications. In spite of the emergent development of technological agency, our symmetrical analysis (Callon, 1986) in our case shows a multifaceted repertoire of interactions involving humans and technology, both indirect as well as face to-face (Hansen et al., 2018).

5.3.2 Analyzing digital discretion in social services

Based on the symmetrical empirical account (5.2), we will now make a tentative analysis of the digital discretion in the application process. As to the *Ethical* public service values (Bush & Henriksen, 2018), digital discretion might contribute to reveal the reasoning behind decisions to *avoid unethical actions and corruption*. The contact between clients and caseworkers that handle the decisions about social assistance is only indirect; by mail or phone. Further, the automated routine for decisions in the Platform provided motivations that are further developed especially concerning negative decision. These features of the layout of human and technological agency are in line with this category of digital discretion. The adherence to rules

and procedures, safeguarding *fair and uniform decision-making* are also strengthened in the sense that the automated systems make approximately 41% of the decisions and partially somewhat more (70%) as in August 2017 (Trelleborg, 2017). In this manner, these decisions are out of hand of the individual case-worker. The adherence is also strengthened through the standardized information that are part of the digital application used by 75% of the clients. Thus, the personal factors related to clients are diminishing in importance through the lack of meetings with caseworkers working with social services and the digital applications (Wenger & Wilkins, 2008). One could therefore argue that unethical actions to some extent are avoided and uniform decision-making is enabled. The lesser influence of feelings was described as something that made a caseworker handle the decisions in a more neutral manner. This is in line with Smith (2011), emphasizing the feelings of caseworkers and their effect on decisions. However, based on our data it is not possible to determine if the decision-making as such, irrespective of if it is made by the automated routine or the human, is fair and uniform in the sense that it is law-proof (Kjellbom, 2009).

In addition, even though human support is available from caseworkers and the Help-desk, our empirical account shows that civil servants are not direct providers of information or writing all types of texts featuring as a basis for a decision. The feelings of caseworkers are important in the sense that they were uncomfortable about the potential of being held responsible for negative decisions in case they took too much part in clients' appeals. In sum, Ethical values associated with desired effects as above is to some degree supported influencing civil servants and clients.

As to the *Democratic public service values*, the layout of digital discretion might allow clients to participate in decision-making thereby being *empowered*. The framework also includes the desired effect of revealing the reasoning and actions made by government to increase *political legitimacy*. In our case here, in the layout of digital discretion clients can be an active part in the application process, primarily through the meeting with the caseworker working with labour market issues. Here they can affect their activity plan. Several interviewees emphasized the strong focus on the individual's needs and on providing different kinds of practical support and help in connection to this. Clients are also potentially empowered through the help they can get in the application process at the Help-desk with digital and manual applications and with appeals concerning negative decisions. Thus, the human agency of civil servants being part of the digital management model are in line with these categories of digital discretion. Nevertheless, the role of technological agency is increasing through the emergent development of the Platform to explain negative decisions and file an appeal. Technological agency also contributes through providing better explanations of the grounds for decisions, especially concerning negative ones. However, these explanations have been developed by local caseworkers.

A straightforward reason for a negative decision made by the automated routine for decisions is the absence of an up-to-date activity plan. Designing and maintaining such plans is something that the client can take an active part in. The empowerment herein and transparency concerning reasoning behind actions made by government, increasingly supported by

technological agency, are thus positive from the point of view of clients. The political legitimacy might in this manner be influenced by the high value in the management model in helping clients to become self-supporting or find a job (Trelleborg municipality, 2015b).

Increased accountability due to enforced adherence to rules and procedures is, in turn, a desired effect and category of digital discretion that is strengthened through the layout of our partially automated process. It is important to remember that the automation has, as described by several interviewees, been designed in close cooperation with caseworkers. The development of automation had been going on since late 2016 and has now late 2018 reached a phase where details of motivations behind negative decisions are designed. Clients are part of the *de facto* layout of digital discretion with the assumed effect of strengthened *empowerment*, somewhat *improved political legitimacy* as well as *accountability* in relation to the management of social assistance. Nevertheless, as interviewees noted, the activity plan as such is sometimes not perceived as positive by all clients. They may see this assistance as more disciplinary and punitive rather than beneficial and humanitarian (Umney, Greer, Onaran & Symon, 2018). This is an interesting take on the presumably increased political legitimacy of the management model.

Regarding *Professional public service values* and the aspired *increased quality of decisions* through improved information processing, this is presumably an effect of the management model. This is because of the streamlined and digitalized gathering of data from the side of the clients. Simply put; due to the e-application that is used by many clients, it is now easier for the caseworkers or the automated routine to read the applications. This is an interesting contrast to research about social workers use of recommended text fields in new ways or use alternative contact channels to obtain information not provided by the system (Devlieghere & Roose, 2018).

It is important to remember that the streamlined process has been developed during the course of a process of several years, and that the digitalization as such was introduced in 2015. The perspective of the civil servants seems to be that they now have more time to spend on other things than routine processes and decisions, and can go deeper into judgements, expert opinions and appeals etcetera. The number of civil servants working with the case management of the decisions about social assistance are smaller than before and the majority of caseworkers have now a focus on labour market issues. However, in our account we can see that to a certain degree this change has been challenged in the very first phase of the change process and might cause resistance (Trelleborg municipality, 2015b). As to the desired Professional value connected to increased quality of decisions, the trust in clients meant that the standard application did not include sending in a lot of documents. However, in the layout of digital discretion, a decision has been made about changing this in the sense that rents and housing contracts must be submitted in future. Thus, our case shows that the development of technology both can include new functions that simplify or introduce more detail in the application process, related to improved information processing.

To reveal the reasoning and actions behind decisions through technology in order to attain the desired effect to *prevent errors* is also related to the new management model. More specifically, it is related to its emergent development in terms of internal routines or algorithms and their “external component” in the form of the repertoire of messages that is communicated in positive as well as negative decisions. However, human agency from the side of caseworkers is still needed in complex negative decisions. Faster and streamlined decision-making through technology use resulting in *increased efficiency* is a desired effect that also appears in our empirical account. However, it is interesting to note that it is not the digitalization and automation as such that has accomplished this since the result of providing a decision to clients in one or two days came earlier than 2017.

This is not to say that the digitalization and automation has no effect on efficiency and costs. Empower unqualified street-level bureaucrats to accomplish the desired effect to *reduce costs* is an aspect of digital discretion that can be applied through this kind of streamlined process, albeit with a sometimes not so positive result (Reddick, 2005). However, what is still needed is a small number of qualified caseworkers that look into the negative decisions etcetera. An important result of our study is also, as annotated above, the further development of the technology as such which is not only a technical issue: it is seen as a must to have at least a few expert caseworkers in each municipality to safeguard the future development of automation. In contrast, our study shows how reduced costs might be accomplished as a result of the changing focus on labour-market issues. Thus, our case indicates the streamlined process as such, and its positive economic result, might not in all its aspects be an effect of digitalization and automation.

6 Conclusions, limitations and further research

A first conclusion is that human and technological agency appear in form of a repertoire of civil servants and technologies interacting with citizens/clients. The core decision about social assistance is made by a *hybrid* involving humans and technology. However, the emergent development includes a strive for increasing the role of technology, and an explicit ambition of preserving human competence. A second conclusion is that many aspects of Ethical, Democratic and Professional discretion are relevant in digitalization and automated decision-making in social services. The client might for example perceive desired effects like fair and uniform decision-making and a potential for empowerment thanks to participation in the case-handling process, some of which enabled through technology. In contrast, at least the management model in our case here included various aspects of control that in parts might be necessary. The digital discretion of civil servants is, in turn, to a significant degree dependent on their actual role in the process. His/her competence as such is enriched during the course of the development of activities and technologies in the management model. At the same time, the actual parts of the process where civil servants have a strong position in terms of various dimensions of digital discretion seem to be somewhat reduced through the further technological development. Our case shows that the detail of the *de facto* layout of organizational aspects of the case-handling process, technology herein and political goals significantly influences digital discretion. Our tentative analysis indicates that the technological development and technological agency itself in some ways seem to be to the advantage of

citizens/clients. Figure 2 summarizes the technological and human agency in the case-handling process in social services. We find a repertoire of more general categories of technological agency that are relevant in various contexts where automated decision-making are used, as well as general and specific ("related to social services") categories of human professional agency.

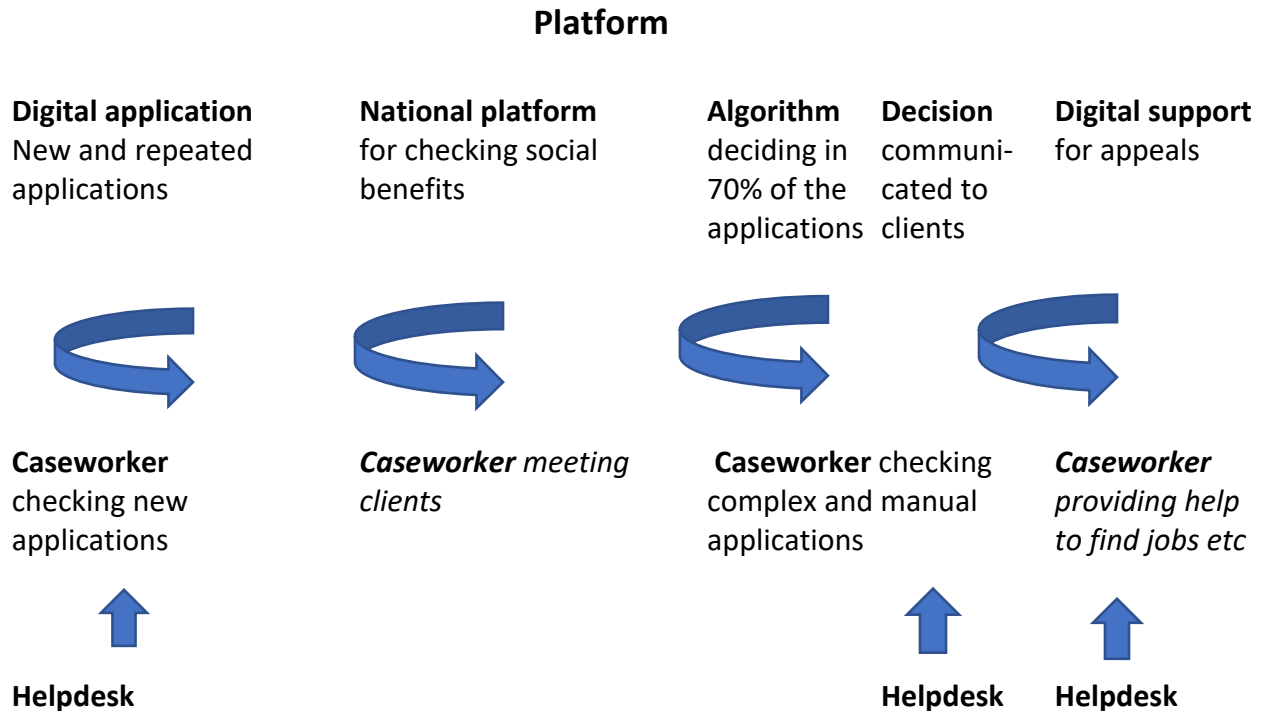


Figure 2: An overview of technological and human agency in social services: context specific types in italics.

Our contribution is a detailed analysis of the roles of human and technology in general, and of digital discretion in particular (Busch & Henriksen, 2018), in a case of automated decision-making in social work. Our study complements others with a more distant focus on the *de facto* contexts of automated decision-making in public sector (cf., Busch, 2017; Wihlborg et al., 2016; Wirtz et al., 2018). The symmetrical (Callon, 1986) perspective has enabled an analysis that “takes technology seriously”, in a way that transcends more common theoretical perspectives of accountability and transparency emanating from political science and the like. This quality does *not* indicate that the role of humans will disappear in interaction (see eg., Hansen et al., 2018) and responsibility (see eg., Suchman, 2003) in a sensitive context such as social services, where the meeting between humans are central in contrast to technology (Laurent, 2008; Witte et al., 2016). Lawmakers, politicians and designers are all responsible for the limits of technology use of presumably weak groups like clients seeking social assistance, as well as the role of professional’s competence and discretionary power (Bush & Henriksen, 2018). Our symmetrical analysis has also enabled a more developed focus on the larger consequences of digital discretion from the perspective of citizens/clients.

In a study of electronic client records in social services De Witte, Declercq, and Hermans (2016) defined “two worlds” the database world and the face-to-face world. Proximity and personalization are often seen as central in social work (Laurent, 2008). Our study shows that meetings between humans might still be an important part of digitalized and automated case-handling, but that their focus might change. A central issue is of course how the weak and needy clients can be detected in a changed “layout” of how social assistance is managed. One answer is that they could be detected during the course of the close interaction with civil servants that might, but not must, be a part of new management models (Figure 1).

One limitation is of course the lack of interviews with clients in the empirical study. This must be remedied in research with an intention to capture the perspective of professionals and clients. Another limitation is the focus on one innovative case and a relatively limited number of interviewees herein. Further studies should include a larger number of caseworkers in at least two, but preferably at least four, cases. In this manner, a model of appearing categories of digital discretion in contexts like these could be constructed. Not less important, in line with ANT, each case makes up an independent actor network in which technological and human actors are enrolled and mobilized with a more or less successful result (Callon, 1986). This is indeed a powerful reason for additional multi-case studies.

References

- Brauneis, R. & Goodman, E. P. (2017). Algorithmic transparency for the smart city. *SSRN Electronic Journal* <https://doi.org/10.2139/ssrn.301249>
- Busch, P. A. (2017). The role of contextual factors in the influence of ICT on street-level discretion. In *Proceedings of the 50th Hawaii International Conference on System Sciences*, IEEE.
- Busch, P. A., & Henriksen, H. Z. (2017). Digital discretion: A systematic literature review of ICT and street-level discretion. *Information Polity*, 1, 1-26.
- Busch, Henriksen & Sæbø (2018). Opportunities and challenges of digitized discretionary practices: a public service workers perspective. *Government Information Quarterly*, 35 (4), 547-556.
- Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fishermen in St Brieuc Bay. In: Law, J. (Ed.) *Power, action and belief: A new sociology of knowledge*. London, UK, Routledge.
- Caronia, L. & Mortari, L. (2015). The agency of things: how spaces and artefacts organize the moral order of an intensive care unit, *Social Semiotics*, 25 (4), 401-422, DOI: 10.1080/10350330.2015.1059576
- Christensen, T., & Lægreid, P. (2018). An Organization Approach to Public Administration. In: E. Ongaro & S. Van Thiel (Eds.), *The Palgrave Handbook of Public Administration and Management in Europe* (pp. 1087-1104). Basingstoke (UK): Palgrave MacMillan.
- Czarniawska, B. & Hernes, T. (2005a). *Actor Network-Theory and organizing*. Liber & Copenhagen Business School Press.
- Czarniawska B. & Hernes T. ed. (2005b). *Constructing macro-actors according to ANT*. Malmö: Liber förlag.
- Devlieghere, J., Bradt, L., & Roose, R. (2017). Policy rationales for electronic information

- systems: An area of ambiguity. *British Journal of Social Work*, 47, 1500-1516.
- Devlieghere, J., & Roose, R. (2018). Electronic information systems: In search of responsive social work. *Journal of Social Work*, DOI: 10.1177/1468017318757296
- De Witte, J., Declercq, A. K., & Hermans, K. (2016). Street-level strategies of child welfare social workers in Flanders: The use of electronic client records in practice, *British Journal of Social Work*, 46, 1249-1265.
- Dworkin, R. (2013). *Taking rights seriously*. A & C Black.
- Dunleavy, P., Margetts, H., Bastow, S. and Tinkler, J. (2006). New public management is dead—long live digital-era governance, *Journal of Public Administration Research and Theory*, 16, 467-494.
- Easterby, M., Thorpe, R. & Lowe, A. (2002). *Management research. An introduction*. 2nd edition. London, Sage.
- Fournazin, M. & Joia, L. A. (2016). Techno-government networks: Actor-Network Theory in Electronic Government research. In: Scholl H. et al. (Eds.) *Electronic Government. EGOV 2016*. Lecture Notes in Computer Science, vol 9820. Springer, Cham.
- Goldkind, L., Wolf, L., & Jones, J. (2016). Late adapters? How social workers acquire knowledge and skills about technology tools. *Journal of Technology in Human Services*, 34 (4), 338-358.
- Goodsell, C. T. (1981). The public encounter and its study. In: Goodsell, C. T. (Ed.) *The public encounter: Where state and citizen meet*, pp. 3-20.
- Hansen, H-T., Lundberg, K. & Syltevik, L. J. (2018). Digitalization, street-level bureaucracy and welfare users' experiences, *Social Policy & Administration*, 52 (1), 67-90
- Heeks, R. & Stanforth, C. (2007). Understanding e-Government project trajectories from an actor-network perspective, *European Journal of Information Systems*, 16, 116-123.
- Kernaghan, K. (2003). Integrating values into public services: The values statements as centerpiece. *Public Administration Review*, 63 (6), 711-719.
- Kjellbom, P. (2009). *Rule of law and flexibility in municipal guidelines for social assistance* [Rättsäkerhet och flexibilitet i kommunala riktlinjer för ekonomiskt bistånd]. *Retfærd*, 4 (127), 80-103.
- Knights, D. & Noble, D. (1997). Networks and partnerships in the evaluation of home banking. In: McMaster, T. et al., (Eds.) *Facilitating Technology Transfer through Partnership Learning from Practice and Research*, Chapman & Hall, London.
- Latour, B. (2005). *Reassembling the social: An introduction to Actor Network-Theory*. Oxford, UK, Oxford University Press.
- Latour, B. & Woolgar, S. (1986). *Laboratory life: The construction of scientific facts*, Princeton, NJ, Princeton University Press.
- Laurent, V. (2008). ICT and social work: A question of identities? *The Future of Identity in the Information Society*. Springer.
- Lipsky, M. (2010). *Street-level bureaucracy: Dilemmas of the individual in Public Services*, Russel Sage Foundation, 30th anniversary edn. New York.
- Lundberg, K. (2018). The welfare subject in the “one-stop shop”: Agency in troublesome welfare encounters. *Journal of Sociology & Social Welfare*, XLV (2), 119-139.

- Lyytinen, K. & Newman, M. (2015). A tale of two coalitions – marginalising the users while successfully implementing an enterprise resource planning system, *IS Journal*, 25, 71-101.
- Madsen, C. Ø. & Kræmmegaard, P. (2015). The efficiency of freedom. Single parents' domestication of mandatory e-Government. *Government Information Quarterly*, 32, 380-388.
- Ministry of Health and Social Affairs (2001). *Social Services Act (Socialtjänstlagen)*. 2001: 453. Stockholm.
- Monteiro, E. & Hanseth, E. (1996). Social shaping of information infrastructure: On being specific about technology. In: Orlikowski et al. (Eds.), *Information Technology and Organizational work*, Chapman & Hall, London.
- Mwenya, J. K. & Brown, I. (2017). Actor-Network Theory in IS-research: Critique on application of the principle of generalized symmetry, *SAICIT '17*, September 26-28, Thaba Nchu, South Africa.
- Orlikowski, W. & Iacono, S. (2001). Research commentary: Desperately seeking the 'IT' in IT research: A call to theorizing the IT artifact. *Information Systems Research*, 12 (2), 121-134.
- Persson, E. (2018). The successful Trelleborg-model causes resistance: "Too much copying" [Succémodellen i Trelleborg möter motstånd: "Man kopierar"]. *Arbetsvärlden*, January 12, <https://www.arbetsvarlden.se/succemodellen-i-trelleborg-moter-motstand-man-kopierar/> [accessed 2018-09-30]
- Pououdi, N. & Whitley, E. A. (2000). Representing human and non-human stakeholders: On speaking with authority. In: Baskerville, R., Stage, J. & DeGross, J. I. (Eds.) *Organizational and Social Perspectives on Information Technology*, IFIP TC8 WG8.2 International Working Conference on the Social and Organizational Perspective on Research and Practice in Information Technology June 9–11, Aalborg, Denmark
- Ranerup, A. (2007). Electronic government as a combination of human and technological agency: Testing the principle of symmetry, *Information Polity*, 12, 153-167.
- Reddick, C. (2005). Citizen interaction with e-Government: from the streets to servers? *Government Information Quarterly*, 22 (1), 38-57.
- Suchman, L. (2003). *Human/Machine Reconsidered*. Centre for Science Studies, Lancaster University, UK.
- SALAR (2018a). *Digital service for social assistance SSBTEK* <https://skl.se/integrationsocialomsorg/>
- Ekonomisktbistandforsorjning/ssbtekdigitaltjanstforekonomisktbistand.2998.html
- SALAR (2018b). *Robot Process Automation – Saving time for value-adding activities* [Automatiserad ärendehantering. Att frigöra tid för värdeskapande arbete]. Stockholm: SALAR.
- Smith, M. L. (2011). Limitations to building institutional trustworthiness through e-Government: a comparative study of two e-services in Chile. *Journal of Information Technology*, 26 (1), 78-93.
- Svensson, L. & Larsson, S. (2017). *Digitalization in social services – an overview* [Digitalisering och social arbete – en kunskapsöversikt.] Lunds Universitet.

- The National Swedish Board of Health and Welfare (2013). *Social assistance. Handbook for social services* [Ekonomiskt bistånd. Handbok för socialtjänsten]. Stockholm.
- Trelleborg municipality (2015a). *Report 2014* [Årsanalys 2014]. Trelleborg.
- Trelleborg municipality (2015b). *Just continue! A way to better quality* [Orka fullfölja. Det är en kvalitetsfråga.] Trelleborg.
- Trelleborg municipality (2017). *Plan 2018. Labour Market Agency*. [Verksamhetsplan 2018. Arbetsmarknadsnämnden]. Trelleborg.
- Tummers, L. & Bekkers, V. (2014). Policy implementation, street-level bureaucracy, and the importance of discretion, *Public Management Review*, 16(4), 527-547.
- Umney, C., Greer, I., Onaran, Ö., & Symon, G. (2018). The state and class discipline: European labour market policy after the financial crisis. *Capital & Class*, 42 (2), 333-351.
- Walsham, G. (1997). *Actor-Network Theory and IS research: Current status and future prospects*. In. Lee, As et al., *Information Systems and Qualitative Research*, Springer.
- Walsham, G. (2006). Doing interpretive research. *European Journal of Information Systems*, 15 (3), 320-330.
- Walsham, G. & Sahay, S. (1999). GIS for district-level administration in India: problems and opportunities, *MIS Quarterly*, 13 (1), 39-65.
- Wenger, J., & Wilkins, V. M. (2008). At the discretion of rogue agents: How automation improves women's outcomes in unemployment insurance. *Journal of Public Administration Research*, 19, 313-333.
- Wihlborg, E., Larsson, H., & Hedström, K. (2016). "The Computer Says No!" – A case study on automated decision-making in public authorities. *Proceedings of the 49th Hawaii International Conference on System Sciences*, IEEE.
- Willcocks, L., Lacity, M., & Craig, A. (2017). Robotic process automation: Strategic transformation lever for global business services? *Journal of Information Technology Teaching Cases*, 7 (1), 17-28.
- Wirtz, B., Weyerer, J. C. & Geyer, C. (2018). Artificial intelligence and the public sector – Applications and challenges, *International Journal of Public Administration*, DOI: 10.1080/01900692.2018.1498103