

Discretion, automated decision-making and public values: Background and test of an approach for unpacking human and technological agency ¹

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Abstract. This study aims to develop a theoretical and analytical approach for studying discretion, automated decision-making (ADM) and the consequential public values. This is achieved through our proposed approach, an overview of literature and an empirical test. The context of our empirical test is decisions made about economic support in social work. The research questions are as follows: 1) What are the relevant components in a theoretical and analytical approach with this specific aim? 2) How does human, non-human and joint, ‘hybrid’, agency influence digital discretion and the consequential public values in social work? 3) What are the usefulness and prospective problems with the approach? Our approach enhances the understanding of the ground for discretion in ADM, which is seen as an emergent routine in the form of knowledge about process, and the details of human and non-human actors involved in relation to consequential public values. To develop its usefulness, the approach should primarily be applied in multiple case studies of ‘in-between’ contexts, such as social work, to generate a theory of the role of human and non-human agency in the consequential public values of ADM.

Keywords: Discretion, Automated Decision-Making, Public Values, Social Work.

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1 Introduction

How does automated decision-making (ADM) influence the discretion or right of civil servants to decide more independently and the consequential public values, such as transparency and fairness [8]? In general, the concept of discretion refers to the right of civil servants to make decisions with a certain degree of autonomy but within the limits of available laws [24]. Recently, their situation has changed due to the ability to make decisions through various forms of ADM [40]. ADM exists in the form of decision support or tools provided in the form of information technology (IT), which helps civil servants find and evaluate information or provide suggestions about what to decide [18]. The technology might even, depending on the available laws in a country [32], provide what can be characterised as ‘a decision’ [40]. ADM can be practiced through various forms of IT, of which robotic process automation (RPA) is a relatively simple category [17]. An RPA function, or a software ‘robot’, can analyse structured data in the form of, for example, information provided by clients based on its algorithms or programme. In this manner, it can perform simple, repetitive tasks, such as suggesting an outcome of such a process (‘a decision’) [17]. A more complex form of ADM uses artificial intelligence (AI) with a more independent capacity to develop its’ algorithm [39].

The influence of IT on discretion has been studied through various themes and concepts. A first theme is studies that suggest new concepts to be used in research. Busch and Henriksen [8] coined the concept of digital discretion to denote the new situation in view of the role of different types of IT. In contrast, Bullock [6] and Young et al. [39] coined the concept of artificial discretion upheld by AI in various forms of ADM in the public sector, in contrast to the concept of human discretion upheld by civil servants. A second theme is studies of the positive and not-so-positive effects of IT on discretion [4, 29]; the latter is often denominated as the curtailment thesis. In these studies, various degrees of consideration about the details of the studied context, humans and technologies appear. The third theme is a small but growing number of studies with a close view of the appearing technologies and their influence on civil servant discretion [29, 31]. Inspired by the actor-network theory [10] and the oft-cited review of algorithm studies by Kitchin [21], Ranerup and Henriksen [31] (first published online in December 2020) simply opted for an approach of ‘unpacking’ human and technological agency. They did so in a qualitative study of civil servants and clients in social work and their use of IT therein in decisions about social assistance (‘economic support for people in need’). They focused on evaluating the effects of discretion and IT in terms of public values [8].

Recently, Glaser, Pollock, and D’Adderio [16] and D’Adderio [11] proposed close studies of humans and technologies in the form of the ‘full socio-technical assemblage’ (i.e. a configuration of human and non-human actors) in conjunction with decision processes or routines that involve algorithms. As a result of a quantitative study of ADM and discretion, de Boer and Raaphorst [4] suggested further research in the form of close studies of IT and performed tasks to better explain their effect on civil servants’ discretion. Thus, close studies of human and non-human actors in decision processes, with a focus on discretion and ADM, are timely and potentially relevant. Thus, the

following question arises: how would an approach for studies about discretion, ADM and the consequential public values with a close view of the repertoire of involved technologies and humans look like?

2 Context, aim and research questions

A larger aim of this study is to propose and test an approach for analysing human, non-human and joint ('hybrid') agency [10, 21] in digital discretion in ADM and the consequential public values. This is achieved through inspiration obtained from authors such as Glaser et al. [16] and D'Adderio [11], but with a focus on ADM and discretion in decision processes or routines rather than on algorithms. Thus, the gap addressed is to provide a theoretical and analytical approach to produce more qualified knowledge about discretion, ADM and the consequential public values [2, 8] in public administration. This is in contrast to high-level, distant studies [4] or studies of more unprecise contexts.

The context used in our empirical test is social work, especially regarding decisions about social assistance. In their systematic literature review of discretion and IT [8], denominated as digital discretion, Busch and Henriksen summarised the situation regarding different contexts: Researchers agree on how complex and sensitive environments make it difficult to use IT in decision-making, whereas in structured mass-transactions, even ADM is possible. The most promising avenue for further research, they argued, is the 'in-between' contexts, such as social work, where certain aspects of decision-making or discretionary practices can be taken over by IT.

The arrangements and legal framing for such economic support might vary, but they are often provided at a minimum level and sometimes with requirements of activities to enhance self-support [15]. In Sweden, civil servants at the municipal level make decisions about providing social assistance to cover expenses for food, housing, etc., based on on-paper applications. Applications for social assistance are increasingly submitted by IT ('e-applications') instead of paper and, in a small albeit rising number of municipalities, include decision support by RPA [32].

The research questions are as follows:

- What are the relevant components of a theoretical and analytical approach with this specific aim?
- How does human, non-human and joint 'hybrid' agency influence digital discretion and the consequential public values in social work?
- What are the usefulness and prospective problems with the proposed approach?

The remainder of this paper is organised as follows. First, the method is outlined. This is followed by our proposed approach and the literature background. After that, we find an account of human and non-human agency in our case study of ADM in social work serving as a test of our approach. This is followed by a discussion about the consequential public values, the value of our approach, conclusions and further research.

3 Methodology

In this study, we further develop and test an approach for studying digital discretion, ADM and public values. To strengthen our approach, a narrative literature review is performed by combining the concept of discretion or digital discretion with other relevant concepts (i.e. IT, civil servants, clients, algorithms, ADM and public values). This is also done by testing the usefulness of our approach through a case study of social work and a concluding critical discussion. The empirical case is the municipality of Trelleborg in the south of Sweden (~45,000 inhabitants), which is the first municipality to use ADM in decisions related to social assistance in 2017.

The empirical data are based on 11 interviews conducted with managers, caseworkers and politicians in the municipality between 2017 and 2019 [31] and four new interviews conducted in June–August 2020 and November 2021. Questions are asked to get the interviewees to talk about the case management process, the IT used, what the involved humans did and the result in terms of public values. Internal reports documenting the activities from the perspective of the municipal labour market agency and external reports about the new method of working are also used.

The collected data are used in a symmetric account [19] and analysis (chapters 5.2-5.3) of the application process for social assistance, with the intention of unpacking [21] the ‘assemblage’ of the types of human and non-human actors involved. In a straightforward manner, we try to ‘follow the actors’ [10] involved in the process. As a second step, in a deductive manner shown in chapter 5.3, we apply a few of the categories of IT use and purposes related to the repertoire of public values chosen from a repertoire suggested by Busch and Henriksen [8] on this account (Table 1). Finally, in chapter 6, we conduct a critical discussion of our approach.

4 Our Approach and Its’ Background

Our original simple idea for studying digital discretion and the involved human and technological actors [31] was, as noted in the Introduction, inspired by Kitchin [21] and ANT [10]. However, Glaser et al. [16] outlined a perspective to be used in studies of algorithms. They suggested what they characterised as a socio-material, performative perspective involving an ‘assemblage’ of human and non-human actors: the last type, both in the form of algorithms and IT, being part of an emergent ‘routine’. In addition, the time dimension was addressed by formulating three ‘biographical moments’: addressing and resolving performance struggles, inscribing and layering programmes of action and translating algorithms to other contexts. In this manner, they could take into account, for example, the theories and goals behind the algorithms; the roles of human actors, such as users and designers and the features of the involved technologies during the course of time. D’Adderio [11] also suggested using the concept of ‘assemblage’ but with a stronger emphasis on the issue of studying more persistent routines of different types that might be in the form of processes for making decisions. The important aspects of routines include the accomplishment of particular tasks, particular sequences

in which actions are performed, the recurrent nature of action patterns and simple regulation in the form of, for example, standard operation procedures performed by involved managers and employees [14]. Recently, Alshallaqi [1] proposed using a ‘socio-materiality’ perspective on discretion, albeit differentiating between ‘users’ (social) and ‘technology’ (material) agency. Compared to these studies, our general approach is simpler (Figure 1): It says that discretion and ADM should be studied by analysing the agency of a broad repertoire or an ‘assemblage’ of human and non-human actors, including joint or ‘hybrid’ activities, in a specific context with known qualities and tasks. The focus is on a case management process or a routine [11, 16] for decision-making in, for example, social assistance with all forms of IT instead of RPA alone. This unravels the influence of the layout of a concrete form of digital discretion on public values [8]. To strengthen the background for our approach, we will now describe recent research related to the concept of discretion combined with 1) technologies, 2) algorithms, 3) humans, 4) contexts and tasks and 5) public values being part of our approach.

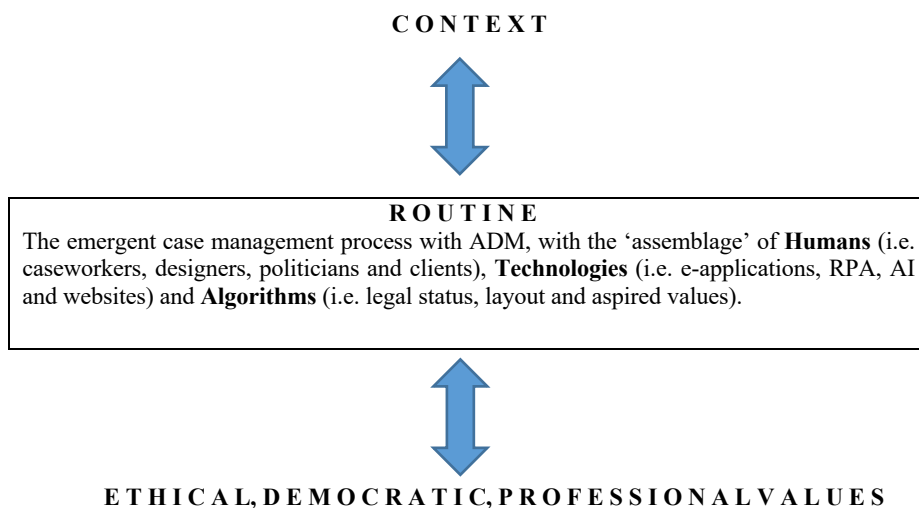


Figure 1. Relationship between theoretical concepts in our approach

4.1 Technologies and Discretion

In their systematic literature review of digital discretion, Busch and Henriksen [8] described the technologies that appeared in the included empirical studies, such as telephones, databases, websites, case management systems and automated systems. They noticed that technology ‘has certain inherent capabilities affording certain actions, [but] street-level bureaucrats do not necessarily make use of them. Various technologies are adopted in street-level bureaucracies influencing discretionary practices differently’ [8, p. 15]. However, they argued that the IT that supports automation limits discretion. As noted by these authors, IT is sometimes not described in any detail but might be decisive

for discretion. Qualitative studies of social work have highlighted that what was denominated as decision-making tools, through their design and theoretical background, influenced caseworkers' decision-making [18]. Nordensjö et al. [27] indicated that discretion and the social worker–client relationship is negatively influenced by IT policies and their use. They argued that future work should investigate whether this is balanced by gains in accountability and lawfulness.

In contrast, Bullock [6] discussed how AI influences discretion, emphasising that its' role might differ in various contexts. Ranerup and Henriksen [31], in a more pragmatic study, analysed IT and its' interaction with humans in a case study of decisions about social assistance and discretion. They found a repertoire of IT-like e-applications, case management systems and RPA, all of which played important roles.

4.2 Algorithms and Discretion

Algorithms in public-sector decision-making is a growing area of research. However, their agency might vary in ADM due to the design and degree of control by humans [28]. In terms of children in need, algorithms might have a prominent role in advice about who should get what type of help [26]. Other studies have focused on the legal status of algorithms in ADM and issues about transparency regarding details in their design [19]. Alternatively, the more general public values of efficiency, fairness and transparency in decision-making might be influenced as an effect of the design and use of algorithms [5]. (For a detailed description of these issues, see the section 4.5.) Thus, different types of IT might influence discretion and so do the aspects related to non-human actors as algorithms.

4.3 Humans and Discretion

Research about humans and discretion includes many categories, the most common being caseworkers or civil servants. In a large quantitative survey, de Boer and Raaphorst [4] investigated the experiences of ADM by civil servants in relation to discretion. They concluded that civil servants perceived that they became more legal and accommodative in their enforcement style through ADM. However, ADM led to less perceived discretion, and it is, therefore, important to provide more details in concrete contexts. Busch et al. [9], in turn, analysed attitudes toward digitalisation in relation to discretion. They found positive attitudes to be greater when professional aspects are promoted, whereas professional discretion is considered necessary for more complex tasks. With examples from policing, social welfare and online moderation, Enarsson et al. [12] analysed the issue of 'humans in the loop' as a complement to ADM. The difficulties in what they denominated as 'hybrid' decision-making, when algorithms and humans are combined, were emphasised.

Zouridis et al. [40] and Lindgren et al. [23], in turn, highlighted the enlarged role of IT developers in the design of discretion. This is because they are important in designing and implementing ADM as well as the information used as a ground for decision-making. IT developers are also important stakeholders in local contexts [23]. Ranerup and Henriksen [30] showed how local politicians played an active role in the context of

social work promoting the use of ADM, including the aspired effects in terms of efficiency and effectiveness.

Although discretion is a concept with the main emphasis on civil servants, clients and citizens, at large, are *de facto* involved in various ways [31]. Bernhard and Wihlborg [3] studied the issue of digital discretion and clients in the form of how professionals are related to the former when RPA is used in state administration. Caseworkers developed strategies for supporting clients to become active in the now digital application and case management processes. Thus, discretion and ADM are relevant from the perspective of caseworkers, but future studies should involve other groups.

4.4 Context, Tasks and Discretion

Bullock [6] discussed the strength of AI and humans in ADM for different tasks and contexts: ‘Tasks that are low in complexity and uncertainty are the likeliest candidates for automation by AI, whereas tasks high in complexity and uncertainty should remain under the purview of human discretion’ [p. 759]. In turn, Zouridis et al. emphasised large execute organisations that have become system-level bureaucracies, mentioning ‘internal revenue services, departments for work and pensions and social security agencies’ [40, p. 314]. They argued that ADM is often used to handle easy cases, whereas the harder, more difficult cases still require human intervention. However, studies of specific contexts of, for example, social work have concluded that discretion is not an ‘all-or-nothing’ phenomenon but a result of ‘gradations of power that exist in the relationship between managers and professional workers’ [13, p. 881].

In addition, in a case study of a court, Busch [7] specifically focused on IT and found that technology has no unilateral effect on discretion. Contextual factors, such as social complexity in a case, skills of caseworkers, need for face-to-face contact and the IT in use, are important. Thus, the context and tasks are proposed as influencing ADM and discretion. More nuanced studies of the ‘in-between’ contexts, such as social work, are required to improve the current understanding of discretion [8].

4.5 Public Values and Discretion

The concept of public values is seen as a response to new public management logics [2], since it includes other values than the economic value typically credited to the digitalisation of processes and systems in the commercial sector. It can be applied in studies of design and use in digitalisation, in general, and in ADM, in particular. There is a repertoire of frameworks that expresses dimensions or aspects of public values. For example, Bannister and Conolly [2] differentiated among duty-, service- and socially oriented values. Selten and Meijer [33], in turn, analysed values related to efficiency and effectiveness (‘sigma values’), fairness and transparency (‘theta values’) or aspects of being adaptive and robust (‘lambda values’).

The more specific issue of public values and ADM has been addressed in a few studies. Against the background of three cases of ADM, Kuziemski and Misuraca [22] discussed the public sector predicament to protect citizens from potential algorithmic harms that are at odds with the temptation to improve efficiency in case management.

As a result of their systematic literature review of digital discretion and public values, Busch and Henriksen [8] distilled 16 categories of IT use and purposes related to the four dimensions of public values proposed by Kernaghan [20]: ethical, democratic, professional and people values (also developed by MacCarthaigh [25]). In short, ethical values provide a guide to what are ‘good’ actions, and representative values are integrity, fairness, loyalty and honesty. Democratic values refer to good connections between the opinions of people and the actions of public administration. Representative values are rule of law, accountability and representativeness. Professional values or professionalism mark civil servants as professional persons. Representative values are effectiveness, efficiency, service, leadership, excellence, innovation and quality.

Table 1. Digital discretion parameters (adapted from [8]).

Societal problem	Leads to	Purpose of IT	Desired effects
Ethical public service values			
Wrong decisions due to different interpretations of rules and personal factors	Unfair and random decision-making	Enforce adherence to rules and procedures	Fair and uniform decision-making
Democratic public service values			
Erroneous assessments of cases	Wrong decisions	Allow citizens/clients to participate in decision-making processes	Empower citizens/clients
Professional public service values			
Discretion is costly and inefficient	High public expenditures and reduced efficiency	Faster decision-making	Reduced costs
Erroneous and inefficient decision-making	Reorganisation of public services	Change work processes	Increased efficiency and improved quality of decision-making

Peoples’ values refer to respect for people in different contexts and with different needs. Representative values are caring, fairness, tolerance, compassion, courage, and humanity. The purpose of using IT from the perspective of ethical values is about avoiding unethical actions and corruption to reveal the reasoning behind decisions. From the perspective of professional values, it can be about increasing efficiency by using IT for faster decision-making (Table 1) [8].

In a study of ADM in decisions about social assistance, Ranerup and Henriksen [31] applied 9 out of the 16 categories of IT use and purpose. The aim was to test Kitchin’s [21] idea of uncovering the full ‘assemblage’ of actors. Nevertheless, compared to

Busch and Henriksen [8], despite the fewer categories of IT use and purposes being related to the public values the result led to more simplifications being seen as necessary. This is even more so in the present study, since we want to improve the granularity of our approach for analysing ADM in our unpacking of human and non-human actors, as described above (Figure 1), and in the research overview in this chapter. Therefore, we address the ethical, democratic and professional values through a limited number (four) of categories of IT use and purposes in relation to these (Table 1). Our chosen categories represent a selection of what we consider as core values and purposes related to the desired effects of fair and uniform decision-making, empowerment of citizens and efficiency, as well as quality of discretion.

5 Empirical Test of the Approach

5.1 Context and Background

The Social Services Act (2001:453) implemented in Sweden states that the provided support shall ‘strengthen economic and social security, equal opportunities and active participation in society’ (Section 1). Social assistance is considered a short-time minimum support where an individual’s responsibilities and activities are emphasised and decisions are handled in case management at the municipal level.

The municipality of Trelleborg introduced a new work model regarding social assistance and reorganisation, meaning that a Labour Market Board rather than a Social Board would handle these issues [34]. The application process was streamlined to provide quick service, and e-applications were introduced in 2015. These changes were made based on a larger programme to improve the efficiency and effectiveness of the case management of social assistance. The goal was to help people in need to become self-supporting (for a full view of aspired intentions, see [30]). In 2016, ADM by RPA was introduced in a few areas of public administration, and in early spring of 2017, it started to be used in simple decisions about social assistance.

5.2 Human and Non-human Actors in the Application Process

Clients. Clients can apply for social assistance on paper or through a device for e-applications on the municipal website. Here, they need to log in using a personal Bank ID. In 2020, up to 85% of the applications were submitted through this device (Personal communication, Manager no. 1, 25 June 2020).

Municipal website. The device for e-applications asks for information about family members, income and personal expenses, such as rent, childcare and home insurance. The design process is described as follows:

We had a communication plan, we had meetings. The IT function was involved and caseworkers from the section that formally handle the decision [...] A group of citizens was selected to participate in the tests and provide their reactions [...] Basically, these are the ones that must understand, not us. (Manager no. 1, 26 September 2017)

Clients. The clients provide the requested information. If they are unable to complete the application and need assistance, they can go to a help desk at the City Hall. From the beginning, no paper documentation was needed in the new applications. However, since May 2019, a formal contract for housing and rent is being requested. In addition, the submitted applications are regularly checked. A manager explained,

Normally, we check every tenth application. Then these clients must send in their documents, which is why the decision process might take longer than normal. (Manager no. 2, September 26 2017).

Municipal website. The application is registered in the internal case management system and in the personal account *My Pages*. A few times for a next-day appointment with a caseworker working with labour market issues is suggested.

Clients. The clients can choose the appointment time. A client attends meetings with a caseworker working on labour market issues and answers the caseworkers' questions and discusses alternatives.

Caseworker who works with labour market issues. A plan for further activities is put together and continuously evaluated, with the aim of finding a job, education or other activities related to becoming self-supporting. A caseworker described what happened,

First, we must determine if the applicant tried to obtain work. [...]. We try to keep this part as brief as possible. Second, we try to focus on how to get a job. We base this part on the individual citizens' competences, plans, and needs. (Caseworker who works with labour market issues, 29 November 2017).

A manager continued, 'What I wanted to say is that the plan is a joint product [i.e., actively involving clients and caseworkers]' (Manager no. 1, 12 August 2019). The caseworker continuously registers in the case management system if the applicant is found to be active to become self-supporting.

Municipal website: The plan about becoming self-supporting was originally provided on paper, but from the autumn of 2020², it has become part of the client account *My Pages*. This has been a complex process due to GDPR and the fact that the plan is individual, whereas the application is made in a way that it can include several people. The case management system holds the information provided by clients, the caseworker working with labour market issues and the actual RPA device itself. The algorithm used by the RPA can, during the spring of 2017, handle rather simple positive decisions. The RPA is made to log into the information in the internal case management system, copy the information and make the required checks formulated by its program or algorithm.

This system does what our instructions says it should do. Everything comes from the regulations that we have [...] It is about building a system based on different variables: Income; yes or no. Rent; yes or no. So it is very logical (Manager no. 2, 26 September 2017).

The RPA solution and programming are provided by a large company Valcon.

We have written what we want and they have worked with this. And then we have had days when they visit us and actually do the work. And then the caseworkers are available for advice. (Manager no. 1, 9 October 2018).

² According to a later informant interview this function was implemented in March 2021.

Additional information about social benefits that the clients receive, such as unemployment benefits, pensions and student allowances, is provided by a national platform for information on social benefits.

Clients, caseworkers, algorithms and technologies: The final stage of the decision about social assistance is made by the RPA and its algorithm for approximately 25% of the (digital) applications and partially so for 75% of the applications in 2019 [37]. However, '[N]o negative decisions are made by the RPA alone' (Manager no. 4, 3 November 2021). Negative decisions are made possible as part of the RPA regarding some cases in June 2020 (e.g. partially negative decisions when the approved rent can be 4,000 Skr but not the sum of 5,000 Skr applied for). Very difficult decisions are handled by a caseworker, and communication with clients is offered through telephone and e-mail. A caseworker described his situation,

No we haven't lost anything. A caseworker stands behind the application.[...] We have not lost our right to decide, but on the contrary improved our capacity to make judgements about what is reasonable costs. [...] Because we can say that it not reasonable to have an electricity bill for 2000 Skr when last month it was 500 Skr (Caseworker no. 1, 29 November 2017).

In the municipality, this decision involving caseworkers, algorithms and technologies is seen as legally binding. This is because the meeting between the client and the caseworker working with labour market issues is seen as a central component and a ground for the decision in 'full' ADM. However, caseworkers check most decisions to safeguard their quality (Manager no. 4, 3 November 2021). The time spent on the administrative case management of the applications has, according to the consultants, gone down by up to 85% [38]. The decision is submitted to *My Pages* on the municipal website. Since 2015, most applicants have been receiving their decisions after one day [34].

Municipal website: The personal account *My Pages* shows the decisions with provided motivations, which have been further developed over the years.

So we have improved the openness about how the text about the decisions are formulated. And the rules behind when the robot should choose a certain message. [...] It is mainly the caseworkers that have worked with this. [...] And we have asked the help desk about when people come with a negative decision, what is it that they don't understand? [...] And the new law about public agencies in May has much to say about that we should communicate in a way that is easy to understand. (Manager no. 1, 9 October 2018.)

Small improvements have the intention '[T]o help the applicants to do right when they apply, so that they don't get a negative decision due to this' (Manager no. 4, 3 November 2021). This helps the applicants and caseworkers, making the process quicker and less resource-consuming.

There is a strive to build up internal competence about RPA in the municipality:

We have a RPA-developer in the municipality and will probably get one more [...] to safeguard that they make the adjustments that we need. And it is of course not AI but it does only exactly that we tell it to do and it is closely connected to our e-service (Manager no. 4, 3 November 2021).

Furthermore, since July 2019, the platform contains a device for filing appeals against negative decisions.

Clients: The clients can log into their accounts and see the decisions and motivations. They participate in agreed-upon activities with the aim of becoming self-supporting. If needed, they can submit a renewed application and continuously attend meetings with caseworkers dedicated to providing support. During the last few years, these activities have been further simplified in terms of all steps in the e-service process, as well as to provide support from teams with a focus on defined parts of the labour market. Activities have been initiated about sharing these services with a nearby municipality [35, 36]. The clients in this adjacent municipality are handled in a separate section of the internal case management system. These arrangements include help to become self-supporting and activation plans.

5.3 Analysis of Public Values in the Application Process

One selected instance of ethical public service values [8] in our study is about using IT to enforce adherence to rules and procedures, with the desired effect of *fair and uniform decision-making* (Table 1). The involved caseworkers use ADM as a decision support [18] or in a limited number of instances for the full decision with additional check-ups. The IT, algorithms and explanations for decisions are continuously developed [29], but internal competence related to RPA is strived for. Appeals against decisions can be made by a new IT device. What has been considered fair and uniform decision-making has demanded that paper documentation of housing and rents be provided. Many more complex decisions are still not fully made by the ADM. In contrast, the data included in the applications are those provided by clients (sometimes with the help of caseworkers at the help desk), and not collected in a more abstract manner from information about a large number of clients to provide input to an AI device [26]. We see a repertoire of types of IT and what they can be used for in the role of supporting humans to act in line with the laws and regulations rather than replacing them.

One selected instance of a democratic public service value applied is about using IT to allow clients to participate in decision-making to *become empowered and avoid wrong decisions*. As emphasised by Ranerup and Henriksen [31], client participation and empowerment are enabled through the available e-services and the help desk. However, the recent high uptake of e-applications also means that social assistance in this manner becomes more of a regular type of public service. In addition, the plan about how to become more self-supporting has recently become part of the digital infrastructure that can be easily accessed by clients. The explanations for decisions have, as mentioned, been continuously developed through caseworkers who have direct contact with applicants and know their needs and questions. However, this is a more indirect study of citizen empowerment and accountability enabled by the layout of digital discretion [27], which is also primarily a concept focusing on civil servants. Caseworkers sometimes make ‘unwelcome’ decisions regarding economic support or required activities from the clients’ side. Digital discretion in line with a democratic public service value does not remove this obligation from civil servants.

Instances of professional public service values applied are about using IT to *accomplish reduced costs* as well as *increased efficiency and improved quality*. The streamlining and design of the case management process or routine has, from the perspective of politicians and designers alike, had the aim of accomplishing a faster process. However, in this way, the risk of ‘costly discretion’ was noticeably counteracted to a significant extent before ADM was introduced in 2017. An open issue is, thus, about the actual effect of ADM in terms of faster decisions, in contrast to other forms of reorganisation and streamlining of case management processes [30]. The instance of democratic public service values about allowing clients to participate in the form of, for example, checking applications, plans and decisions through the digital infrastructure (*My Pages*), is also in line with this value, since caseworkers’ time to handle questions by phone and otherwise might be saved. However, whether or not this happens needs to be further studied.

A reorganisation of the process or routine, including new roles for caseworkers with an emphasis on decisions about applications or providing support, has occurred. The process has also changed through IT and streamlining. Regarding the desired effect of improved quality in the routine, in general, and decision-making, in particular, the IT and algorithms have continuously been developed by designers and caseworkers [29]. However, the activities required to enable clients to become self-supporting have also been developed. In particular, in an analysis of digital discretion, one must take into account the ‘state of the art’ of the full repertoire of IT, its design and use, but also how the time that is saved by ADM is spent. In the area of social assistance, such activities are important examples.

6 Conclusions, Limitations and Further Studies

This paper outlines and tests an approach for close studies of the ‘assemblage’ of human and non-human actors in the analyses of ADM, discretion and the consequential public values in decision processes or routines [11, 14, 16, 21]. Chapter 4 outlined our approach and its components using related research. How, then, does human, non-human and joint, ‘hybrid’ agency influence digital discretion and the consequential public values in social work? Chapter 5 presented our test and analysis of the test result. We conclude that the *joint capacity* of an ‘assemblage’ of continuously developed human and non-human actors is decisive for the *de facto* discretion in ADM, as shown by our case. However, the decision as such might also be made by a ‘hybrid’ in situations where ADM by involved actors is seen as critical in the final decision. This is because the meetings between caseworkers working with labour market issues and clients in our empirical case are defined as central for the outcome. An instance of relatively ‘full ADM’ can, thus, be based on the appearances of ‘humans in the loop’ [12].

Regarding ethical values, there might be a repertoire of components in the ‘assemblage’ of an emerging infrastructure for a case management routine that can be of help in fair and uniform decision-making [5]. Regarding democratic values, clients might be empowered by the participation enabled by different types of IT, but the discretion of civil servants is preserved in the form of their capacity to make ‘complex’ decisions

and their obligation to play an active role in more or less appreciated decisions and activities. Regarding professional values, ADM and discretion might also be influenced by the reorganisation of the process as a whole (in our case, for example, the full repertoire of IT and its actual use in the case management process and the support provided). An important conclusion is, therefore, that studying digital discretion as a routine [11, 16] enlightens the changes influencing decision-making in the remaining non-digital parts, as well as the situation of civil servants and clients herein, the latter with an option to remain non-users. Last, due to our approach and the result of our empirical test, we conclude that ADM and (digital) discretion are influenced by the continuous redesign of non-human actors (i.e. e-applications, further developed algorithms, infrastructure for offering access to decisions and explanations and plans), as well as other more human or organisational parts of the routine (i.e. meetings and forms of support).

Thus, what are the usefulness and prospective problems with the approach? Ironically, in our case, we detected an instance of a later phase in Glaser et al.'s approach [16]: 'Translating algorithm to other contexts' in the form of an arrangement for handling a case management process of a nearby municipality. Our approach has rightly not been about analysing phases in a development process, as in Glaser et al.'s [16] study, but about capturing important historical facts behind the routine for case management. However, our approach of uncovering the 'full assemblage' of actors, including notes about history, might be questioned for containing data about different points in time. However, the significant advantage is that the case management routine [11, 16] is at the centre of attention. This supports the value of detailed studies of actors and actions [1], in contrast to more distant or undefined situations [4].

Our case study shows the ways in which ethical, democratic and professional values [8] are influenced by the repertoire of IT in the routine, its design and use related to digital discretion. However, multiple forms of agency and public values must be accounted for. There is a need to focus on a few categories of IT use and purposes related to public values (Table 1). In the present study, we selected four out of a total of 16 categories [8]. This study is limited to one case of social services. Further studies should apply the approach to several cases in, for example, social services and their arrangements in the 'assemblage' of actors [11, 16]. This will enable evaluations of the detailed configurations of actors in the routines, comparisons and the creation of typologies of design related to the digital discretion parameters, as described above. Of course, the simpler and more complex contexts [6, p. 40] regarding the organisation of discretion, in contrast to the 'in-between' level of social services, are also relevant for further studies [8]. However, the account and analysis of 'in-between' contexts might contain content to enable a result in terms of theorising the identified components of the 'assemblage' that influence digital discretion and the resulting values.

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