PHD DISSERTATION

DISCRETION AND PUBLIC DIGITALISATION

A happy marriage or ugly divorce?

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DISCRETION AND PUBLIC DIGITALISATION

A HAPPY MARRIAGE OR UGLY DIVORCE?

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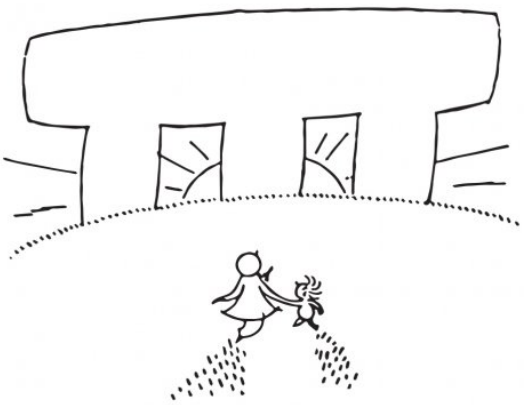
To my mum and dad
for teaching me to follow my dreams,
stay focused, and have patience:

Things Take Time.



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ABSTRACT

'The problem of discretion'. 'The need for discretion' 'The fear of discretion'. 'The benefits of discretion'. 'The control of discretion'. 'The growth of discretion'. 'The death of discretion'.

Recently, 'discretion' has been rediscovered as a central concept in public digitalisation, where it is primarily seen in terms of the impact of technologies on frontline workers' ability to act flexibly and responsively in practice. In both academic and public debates, discretion and public digitalisation are often viewed as opposing concerns and competing interests. There are those who believe that discretion is subjective and random, whereas data-driven technologies, on the other hand, are objective and evidence-based. In a related move, the Danish government is progressively working towards 'objective criteria over discretion'. This is coupled with an aspiration to use data to drive growth and the belief that emerging technologies, such as automation and artificial intelligence (AI), can make 'better decisions' than humans and enable 'faster and more efficient case processing'. In contrast, critics oppose the possibility of replacing human decision-making with algorithms because of the contingencies that arise in practice, which often require tailored approaches and discretionary decisions. The result is that we are often left with two opposing claims: that public digitalisation solves problems, or that it causes them. There is less clarity as to what might be the 'best' way to move forward.

Every time public services are digitalised and tasks are augmented or automated, decisions are also made about discretion, how it is used, and how it should be used. The decisions made here can have a profound impact on how public services are viewed, approached and delivered. In this dissertation, I demonstrate the need to develop a more nuanced understanding of discretion, to enable ways to involve the perspective of those whose work has been and increasingly will be affected by these decisions. I focus on how an extended view on discretion can be achieved by adopting an ethnographic approach to Computer-Supported Cooperative Work (CSCW) and an interdisciplinary engagement with related fields such as sociology, science and technology studies (STS) and computer science (CS). Based on three years of ethnographic fieldwork in two Danish municipalities, my dissertation empirically demonstrates the collaborative, situated, and negotiated character of discretion in social work practice, and its role in how cases are approached and information is gathered, used, shared, presented and recorded. By considering the multiplicity of discretion, and the practice in which discretion is embedded, I wish to enhance the concept of discretion from one that mainly sees the relationship between discretion and public digitalisation as singular to one that considers its multiple engagements. This entails a shift in conceptual, empirical, analytical and practical focus, from merely seeing discretion as an individual act, impacted by technological implementation - to considering its collaborative practice (and value) as part of a design process.

Keywords: *Discretion, public digitalisation, social work, situated actions, invisible work, data, classifications, values in design, co-design.*

RESUMÉ

'Problemet med skøn'. 'Behovet for skøn'. 'Frygten for skøn'. 'Fordelene ved skøn'. 'Kontrol af skøn'. 'Udvidelsen af skøn'. 'Enden på skøn'.

'Skøn' er for nylig blevet genopdaget som et centralt koncept i offentlig digitalisering, hvor det primært ses i forbindelse med teknologiers indvirkning på frontpersonale's mulighed for at handle fleksibelt og responsivt i praksis. I både akademiske og offentlige debatter betragtes skøn og offentlig digitalisering ofte som modstridende bekymringer og konkurrerende interesser. Der er dem, som mener, at skøn er subjektivt og tilfældigt, mens datadrevne teknologier på den anden side er objektive og evidensbaseret. På en lignende måde arbejder den danske regering gradvist mod 'objektive kriterier over skøn'. Dette er kombineret med et ønske om at bruge data til at drive vækst og troen på, at nye teknologier, såsom automatisering og kunstig intelligens (AI), kan træffe 'bedre beslutninger' end mennesker og muliggøre 'hurtigere og mere effektiv sagsbehandling'. I modsætning hertil er kritikere modstandere af muligheden for at erstatte den menneskelige beslutningstagning med algoritmer på grund af de uforudsete forhold, der opstår i praksis, og som ofte kræver skræddersyede tilgange og skønsmæssige beslutninger. Resultatet er, at vi ofte har to modstridende påstande; at offentlig digitalisering løser problemer, eller at det forårsager dem. Der er mindre klarhed over, hvad der kan være den 'bedste' vej fremad.

Hver gang offentlige ydelser digitaliseres, og opgaver ændres eller automatiseres, træffes der også beslutninger omkring skøn; hvordan det bruges, og hvordan det bør bruges. Beslutningerne, der træffes her, kan have en dybdegående indvirkning på, hvordan offentlige ydelser betragtes, tilgås og leveres. I denne afhandling demonstrerer jeg behovet for at udvikle en mere nuanceret forståelse af skøn, for at muliggøre måder at inddrage perspektivet hos dem, hvis arbejde har været og i stigende grad vil blive påvirket af disse beslutninger. Jeg fokuserer på, hvordan et udvidet syn på skøn kan opnås ved anvendelsen af en etnografisk tilgang til computerunderstøttet samarbejde (CSCW) og et tværfagligt engagement med relaterede områder, såsom sociologi, videnskab- og teknologistudier (STS) og datalogi. Baseret på tre års etnografisk feltarbejde i to danske kommuner, demonstrerer min afhandling empirisk den samarbejdsvillige, situerede og forhandlende karakter af skøn i socialt arbejde samt dets rolle i måden hvorpå sager tilgås og information indsamles, bruges, deles, præsenteres og noteres. Ved at tage hensyn til mangfoldigheden af skøn og den praksis, hvor skøn er indlejret, ønsker jeg at udvide begrebet 'skøn' fra et begreb, der primært ser på forholdet mellem skøn og offentlig digitalisering i ental til et, der betragter dets mange engagementer. Dette indebærer et skift i konceptuel, empirisk, analytisk og praktisk fokus; fra blot at overveje skøn, som en individuel handling, påvirket af teknologisk implementering – til at betragte dets samarbejdende praksis (og værdi) som en del af en designproces.

Nøgleord: *Skøn, offentlig digitalisering, socialt arbejde, situerede handlinger, usynligt arbejde, data, klassifikationer, værdier i design, samskabende design.*

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PUBLICATIONS

List of publications included in the dissertation:

PUBLICATION 1

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PART I

INTRODUCTION

CHAPTER 1: PREAMBLE

If you look up the word *"vilkårlig"* in the Danish-English dictionary[1], you will find the following translation: *"arbitrary, random,* ***discretionary***".

It matters how we define 'discretion'. The words we use to describe discretion, especially as it relates to public digitalisation, can have a profound impact on how discretion and its application is perceived and subsequently performed. When the Danish government claims that emergent technologies, such as automation and AI, can make *"better decisions"* and achieve *"faster and more efficient case processing"* than human social workers (Ministry of Finance, 2019, pp. 5-10), they are also making claims about the nature of discretion. This often happens without considering the perspective of those whose discretion is up for reconsideration.

'Discretion', broadly defined as the exercise of judgment and freedom to act within limits (Evans and Hupe, p. 7), has traditionally been considered a defining feature of public administration. As noted by Lipsky (1980), 'street-level bureaucrats', such as social workers, used to enjoy large discretionary freedom as they engaged with individual cases 'on the street', in the gap between policy and practice. Yet, as the focus shifts towards digitalisation, discretion is increasingly viewed as the 'weak link' in professional practice (Hardy, 2020). Across academic disciplines, scholars argue that discretion no longer belongs to 'street-level bureaucrats', but is a privilege reserved for certain groups, such as 'system-level bureaucrats' (Bovens and Zouridis, 2002). In these cases, it is often claimed that discretion is 'subjective' and 'random', and that data-driven technologies, on the other hand, are 'objective' and 'evidence-based' (Justesen and Plesner, 2018; Petersen et al., 2020). In a similar manner, it is widely accepted that digitalisation can (and should) be used as a means to reduce the discretionary freedom of street-level bureaucrats (Busch and Henriksen, 2018).

There has also been criticism of the idea that technology would play a 'controlling' role in the relationship between discretion and public digitalisation. Several studies point out that technologies are unable to support the informal dimensions of decisions, and thereby obscure the use of discretion (Jorna and Wagenaar, 2007; Evans, 2010; Høybye-Mortensen and Ejbye-Ernst, 2018). In a nutshell, discretion and public digitalisation are portrayed as having 'parallel lives'. Other studies point to 'trust issues' in the sense that even when processes are fully automated, discretion happens at the street level, when uncertainty about the operation of an algorithm persists (Pääkkönen et al., 2020).

It is obvious that researchers tend to disagree about the influences of discretion, and they often treat the relationship between discretion and public digitalisation as opposing concerns and competing interests. In spite of this, it is noteworthy that there are some similarities between the different strands of research on discretion, particularly in how they draw upon traditional views of discretion, defined as the freedom of an individual to alter pre-defined prescriptions in response to concrete cases. Despite different focuses of interest, it is this basic understanding of discretion that has remained at the heart of most debates and served as a benchmark against which new ideas are assessed. This means that, despite regular critique of top-down approaches

[1] I used Gyldendal's Danish-English dictionary to search for the English translation of the Danish word *"vilkårlig"* (which may translate to *"random"*): https://ordbog.gyldendal.dk/#/pages/result/daen/vilkårlig/expert.

to technological implementation, the concept of discretion as 'subjective' and 'random' has largely remained the same.

What is currently missing from academic and public debates on discretion and public digitalisation is a practice-oriented understanding of discretion, from the perspective of the street-level bureaucrats whose work has been and continues to be affected by the increasingly advanced technologies that alter their decisions or make them on their behalf. Thus, by considering the perspective of street-level bureaucrats, this dissertation aims to contribute to a more nuanced understanding of discretion and its relationship with public digitalisation.

The central question asked in this dissertation is:

What is the relationship between discretion and public digitalisation?

To investigate this question, my dissertation adopts an ethnographic approach to Computer-Supported Cooperative Work (CSCW) and empirically examines the ways in which discretion is articulated and used by social workers[2], as part of the 'naturally occurring' setting in which technology is brought into play. Throughout a period of three years, I have used a combination of in situ observations and in-depth interviews, and have studied the documents relate to social workers' practice. Because of this, I have been able to look at discretion from various angles, from the social workers' dynamics of behaviour to their reasoning behind it, including the influence of the broader context in which discretion is embedded. The research settings include two Danish municipalities handling child protection and welfare benefit cases. Thus, one of the purposes of this dissertation is to inform the design of technology for the benefit of social workers in these areas. The areas are characterised by high complexity and may involve many unknowns and changes over time. Nevertheless, these areas have also been at the forefront of the 'fight' against discretion and the Danish government's pursuit of digital transformation (Walsøe, 2003; Lauth, 2016; Chiusi et al., 2020).

My dissertation includes four publications, each addressing different but related aspects of discretion and its relationship with public digitisation. Following the interdisciplinary nature of the CSCW field, my research also draws on knowledge from a broader area of fields, such as human-computer interaction (HCI), sociology, science and technology studies (STS), ethnomethodology, participatory design (PD), public administration, political science, and computer science (CS). In combination, my publications empirically demonstrate the collaborative, situated, and negotiated character of discretion in social work practice, and its role in how cases are approached and how information is gathered, used, shared, presented and recorded. Together, my findings point to a need transform the concept of discretion from one that sees the relationship between discretion and public digitalisation as singular to one that considers its multiple engagements in practice. My main argument is that this entails a shift in conceptual, empirical, analytical and practical focus, from merely considering discretion as an individual act, impacted by technological implementation, to considering its collaborative practice (and value) as part of a design process.

[2] For the sake of clarity, this dissertation refers to all caseworkers as 'social workers' to emphasise the type of work they do, and clearly distinguishes between their professional backgrounds whenever necessary.

Since all relationships are situated, complex, diverse, and dynamic, this dissertation does not seek to develop a generalised argument or attempt to reveal any absolute 'truths' about discretion and its relationship with public digitalisation. A critical aspect of the comparisons I make is to ensure that debates are balanced, allowing multiple perspectives to benefit from new technologies in such a way that different perspectives, including those of practitioners, feel heard. This includes a recognition that the perspective of users is not the only perspective to be considered. Yet it is a crucial and often overlooked perspective in current discussions about discretion and public digitalisation. Thus, my objective is to provide accounts of the practicalities of discretion, from the perspective of those who perform it and who are considered the intended users of technology.

By placing the concept of discretion and studies of social work at the centre of attention, my dissertation makes a significant contribution to CSCW. Nevertheless, as I will demonstrate in the following chapters, my contributions extend beyond the field of CSCW, since my findings and their implications are also applicable in other contexts, and in practical settings.

The following reading guide provides an overview of how my dissertation will meet its aims and objectives, and sets out the relevant information obtained by reading each chapter.

1.1 READING GUIDE

In *Chapter 2*, I explain the background of this dissertation by paying particular attention to the Danish public sector and political debates around discretion in the context of public digitalisation. As such, the chapter situates the research conducted for this dissertation and sets the stage for the following chapters.

In *Chapter 3*, I present the conceptual reflections of my research. First, I review and discuss different scholarly perspectives on discretion and the need for a more nuanced understanding of the concept of discretion in relation to public digitalisation. Second, I propose an integration of discretion with CSCW studies on practice-oriented design and discuss how CSCW perspectives on plans and situated actions, invisible work, classifications, co-design, and values in design, can contribute to a more nuanced understanding of discretion and it relationship to public digitalisation. Finally, I present my contributions towards a CSCW perspective on discretion and the value of this approach for studies on discretion, and for CSCW as a research field.

In *Chapter 4*, I describe the research undertaken for this dissertation, including the field of study, the nature of the project, the site of research, and the methodology used to obtain and analyse data. Data collection primarily consist of in situ observations, in-depth interviews and document gathering. The analysis follows an iterative process and uses my ongoing interpretation and understanding to inform the direction of my fieldwork. Finally, this chapter reflects on how my research has evolved and how my position as a researcher has changed.

In *Chapter 5*, I summarise my findings from each of the publications and address their contributions to research and practice. The first publication lays the foundation for examining discretion empirically and understanding it as a collaborative achievement that is involved in every decision that social workers make during casework. The second publication expands on these findings by investigating the discretionary judgments of social workers as they create, share, and collaboratively negotiate information about citizens and hide this information from

their records. As a result, the paper raises awareness about the discretionary power of social workers, which stands in front of system design and shifts the focus from technical factors in design to moral questions about which data should be made available outside contexts of use.

The third publication builds on the previous two by examining social workers' articulation of their discretionary values as part of a participatory design setup and as part of the modelling of digital case processes. In conclusion, the fourth publication reflects on the entire research period. This publication includes an analysis of the challenges caused by the different, and often conflicting, perspectives during fieldwork and demonstrates the need for collaborative engagement across disciplines, in an effort to take a responsible approach to public digitalisation.

In *Chapter 6*, I conclude with a summary of the dissertation and a recap of its contributions, followed by questions that remain unanswered and may be pursued in future research.

CHAPTER 2: BACKGROUND

This chapter explores the background and context of public digitisation in Denmark, paying particular attention to the debates regarding discretion. The Danish public sector has specific characteristics which affect laws and policies on digitalisation and differentiate it from other nations. In this chapter, I begin by providing some of these characteristics and discuss how they have come to influence dominant views on discretion and its role in public digitalisation. I conclude with a brief summary of the dominant perspectives present in these debates, and illustrate the importance of taking into account multiple understandings (and definitions) of discretion and public digitalisation in how we think about their relationship now and in the future. Consequently, this chapter is intended to set up the following chapters and provide a background for explaining the research conducted for this dissertation.

2.1 THE PUSH FOR DIGITALISATION

Denmark is currently among the most digitalised countries in the world, and the public sector is leading by example. Denmark holds a strong position as 'world champion' in public digitalisation, according to the UN (Hall, 2020), and the government continues to make large investments to be a digital frontrunner and bring Denmark into the *"digital future"* (Ministry of Industry, 2018, p. 34).

The development of public digitisation in Denmark is considered an integral part of the government's overall goal of improving public services and, as early as 1982, technology was officially announced as a crucial means to achieve this goal (Jæger and Lofgren, 2010). The more recent push towards a digital public sector began in 1994, with the first national digitalisation strategy, *"The Info-Society 2000"* (Ministry of Research and Information Technology, 1995). The report led to a continuous stream of initiatives, all suggesting how information technology should be utilised to benefit the public sector (Henriksen and Damsgaard, 2006). Since then, the national digitalisation strategies have undergone several changes, notably in the underlying ideals that drive digital transformation and facilitate the transition. Whereas in the 1990s, the government emphasised a focus on democracy and participation, this focus subsequently shifted towards increased legality and efficiency, and along with it, a continuous effort to get more service out of a limited public budget (Henriksen, 2018). Politicians stated that the public sector needed to be slimmed down through wide-ranging modernisation programs, such as governance models like 'New Public Management' (NPM) (Schou, 2018, p. 42)[3]. Research further suggests that NPM reduced the discretionary freedom of front-line workers, since: *"If the economy […] is under pressure, discretion will come under pressure too"* (Nørby, 2016).

3 As noted by Schou (2018), Greve (2006, p. 165) argued that by 2006, NPM had become omnipresent in the Danish public sector: *"Talk to any public manager in the Danish public sector and they will use the well-known vocabulary and phrases connected with NPM: performance-based management, market mechanisms, quality systems, balanced score cards, customer orientation, e-government, performance-related pay and contracts. […] Every organization today has to have written efficiency strategies (service strategies in local government) that state what management tools the organizations use in order to fulfil their mission from politicians and citizens."*

Discretion is also seen in relation to trust, and Denmark is generally considered to be a country where people trust each other to make good judgments and have good intentions (Tinggaard, 2020). This also means that Danish professionals enjoy a high degree of discretionary freedom, compared to those in other countries. Discretion has traditionally been essential for understanding the knowledge work of professionals (Haase, 2018). Nevertheless, professional negligence and malpractice have resulted in a number of heart-breaking cases (Møller, 2018). One of the most infamous cases is 'Tønder-sagen' (the 'Toender case') from 2005. The case involved sexual abuse of children that went unchecked for years despite the municipality being served 14 separate notices about suspicions of child neglect. Several of these cases have led to public outrage and criticism of the municipalities and social workers involved (Møller, 2018), as well as the introduction of a new case management system in 2011, called 'DUBU' (Digitalisation of Vulnerable Children and Youths). The Danish government established DUBU to provide social workers with guidance in cases from A-Z, but it was equally criticised and discontinued for being 'too rigid' and for burdening social workers with bureaucratic 'check-list' tasks (Bræmer, 2015; Andersen, 2017).

Another area where debates about discretion have occurred is in the provision of welfare benefits to unemployed citizens. In this context, concerns about how discretion is exercised are embedded within a wider debate about the various backgrounds of social workers in job centres, many of whom do not have a professional degree in social work (Lauth, 2016). One headline of the time read: *"Is the caseworker at the job centre a trained hairdresser or carpenter?"* (Lauth, 2016).

Despite the importance of trust in the Danish public sector, a growing lack of trust in social workers' competence and ability to exercise discretion well has led to various strategies of oversight, constraint and regulation (Høybye-Mortensen, 2014; Ponnert and Svensson, 2016). Over the years, a belief has risen that increased scrutiny will help to improve public service delivery, and, as a growing number of tasks are digitalised, discretion is increasingly designated as the 'weak link' in professional practice (Hardy, 2020) and in the relationship between discretion and public digitalisation. This is supported by Denmark's most recent national digitalisation strategy from 2016 – "*A Stronger and More Secure Digital Denmark – The Digital Strategy 2016-2020"* (Agency for Digitisation, 2018a) – as research reveals not only that legality and efficiency have become the most frequently cited values, but also that the previous values of democracy and participation have fallen to the lowest level (Persson et al., 2017).

The Danish Agency for Digitalisation is currently working on the next digitalisation strategy, to replace the 2016 version. This strategy will not come into effect until 2022 (Hansen, 2020) and the current government (formed in June 2019 by the Social Democratic Party) have not shared information on interim agreements or progress (Oxvig and Hansen, 2020). Nevertheless, there are no indicators that the drivers for digital growth have changed. On the other hand, technological advances in automation and AI in the past few years mean that increasing amounts of work which used to belong to social workers are now being supported by or replaced by machines. This is reflected by key initiatives of the Danish government in the past few years, where the focus has increasingly been on automation and AI, and heavy investments – both financial and symbolic – are being made in data-driven public administration (Winthereik, 2020).

2.2 DISCRETION AS A BARRIER TO AUTOMATION

The introduction of *"Digital-ready Legislation"* in July 2018 (Agency for Digitisation, 2018b) is seen as one of the Danish government's major steps towards realising the benefits of emergent technologies, such as automation and AI. Around this time, policymakers began to problematise how current legislation stands in the way of public digitalisation, as they noted how complex legislation with several exceptions, vague terms or *discretion* may prevent an efficient and digital public administration (Agency for Digitisation, n.d.). Digital-ready legislation emerged as a new phenomenon to *"cut red tape"* by simplifying legislation to enable digital administration of rules. Digital-ready legislation received full support from all parties in the Danish parliament, who, in early 2018, made it mandatory for policymakers to assess the digital compatibility of all future laws, so that case processing can be automated as much as possible (Finansministeriet, 2018). Seven principles have been developed to help meet this goal, and among these is a reduction of discretion, or 'objective criteria over discretion' (Agency for Digitisation, 2018b).

According to policymakers, it is a prerequisite for automated case processing to design digital-ready legislation to replace 'subjective criteria' with 'objective criteria' (Justesen and Plesner, 2018). Thus, the strategy not only considers discretion as inferior to automation, but also contains implicit claims about the nature of work. It assumes the existence of a noise-free relationship between human reasoning and formal decision-making procedures and that casework can be reduced to a decontextualized operation (Webb, 2001, p. 69). Furthermore, as noted in the first publication of this dissertation (Petersen et al., 2020), it is based on a dubious attitude towards discretion, defined as an arbitrary and capricious exercise of individual authority that may be inconsistent with a successful implementation of service delivery.

The *"Strategy for Denmark's Digital Growth"* (Ministry of Industry, 2018) was launched later in 2018 and was, among other things, based on the political agreement to simplify legislation to promote automated case processing. Despite political desire, research findings show that digital-ready legislation is a dormant issue, as it creates the ill-described and heavily debated conditions for how public organisations are digitalised (Plesner and Justesen, 2021). Nevertheless, digital compatible laws continue to be a key focus for the current government, who recently stated that *"in 2021, the Agency for Digitisation will continue to contribute to new legislation being ready for digitalisation"* (Agency for Digitisation, 2021, p. 6). The removal of discretion in favour of automation has also been discussed in the media as *"necessary for success"* (Pedersen, 2018), and the professionalism of social workers has been questioned as part of political debates. For example, during a 2018 conference on digital-ready legislation in Denmark, the question *"should a computer be able to forcibly remove a child from home?"* led to heated discussions about the professional judgements made by social workers as part of complex cases involving vulnerable children and families (Frederiksen, 2018).

2.3 PROFILING AND PREDICTING WITH DATA

In addition to investments in automated case processing, Denmark has also been referred to as an 'AI nation' (Andersen et al., 2019), and in early 2019, the government launched a *"National Strategy for Artificial Intelligence"* (Ministry of Finance, 2019). Intertwined with this is an ambition to use data as a key driver of growth (Ministry of Industry, 2018) and a belief that AI, by combining data and algorithms, can make *"better decisions"* and achieve *"faster and more*

efficient case processing", based on its ability to *"mimic the way humans learn, make decisions and solve problems"* (Ministry of Finance, 2019, pp. 5-10).

Risk prediction is currently at the heart of the design of automation and AI-based systems in the Danish public sector. Besides fraud detection and prevention, child protection and welfare benefits services have been a focus in this area (Chiusi et al., 2020), as also illustrated by examples from Denmark. For instance, 'Asta', a so-called AI 'assistant', was recently introduced in Danish job centres with the captivating promise: "*With AI technology, it becomes possible for us to see what [is] required for an unemployed [person] to get a job [and it] can deliver a better match than the caseworkers will be able to"* (Schultz, 2018). In a similar fashion to Anderson's (2008) claim that 'big data is the end of theory' ten years earlier, Schultz contends:

> *Asta is comparable to when they cheat in the TV kitchen and peel the potatoes beforehand. The less manual work the chef has to do, the closer he will be to his professionalism. Peeling potatoes doesn't require gastronomic skills, and the peeling process isn't interesting to the end result. This same applies to the caseworker.* (Schultz, 2018)

Another example of risk prediction is a model to improve decision-making in the Danish child protection system. Designed by a team from Aarhus University in Denmark, the tool draws on public data and case records to predict the likelihood that a child referred to children's services will later experience a foster care placement. The tool generates risk scores (from one to ten) for social workers when making decisions about at-risk children, and is designed to improve their decisions on whether to escalate or de-escalate a child's case (Lund, 2019). Between 2018 and 2019, the tool was tested across a number of Danish municipalities as part of real cases, but without informing citizens and without having involved social workers in the design process. In one case involving a two-year-old child, a social worker estimated a high risk score of nine against the algorithm's low risk evaluation of one. It was revealed only two years later, in 2021, that the algorithm had automatically considered the two-year-old as being at lower risk due to her young age – and thus that it had a systematic bias towards older children (Kulager, 2021).

History demonstrates the trouble that results from considering the ethical implications of new technology only after it is upon us. Although there have been public scandals, the freedom to experiment with automation and artificial intelligence in the public sector has also appeared to include the freedom to fail. As suggested in a recent comment by Denmark's current Minister of Finance, there is no need to wait for the Data Ethics Council to comment on a pool of experimental cases of AI in the public sector (Chiusi et al., 2020). This is indicative of the government's eagerness to develop quickly rather than prioritise ethics (Fribo, 2019).

2.4 DATA, GDPR AND THE EU'S NEW AI REGULATION

The increasing use of predictive algorithms in both the private and the public sector has prompted regulation aimed at making them more transparent. The ability to provide information about how systems derive their predictions or classifications has long been recognised; however, recent work addresses novel challenges of increasingly complex machine learning models, whose logic and outputs are becoming harder to explain (Binns et al., 2018).

The European Union's General Data Protection Regulation (GDPR) from 2018 is making a series of remedies and safeguards on algorithmic decision-making, focusing mainly on protecting people's privacy. GDPR governs the way in which it is possible to use, process and store personal

data. The law generally prohibits solely automated decisions (i.e. without human intervention), including those based on profiling, that have legal or similar effects on individuals (Article 22). However, the restriction covers automated decisions only. In many cases, high-stakes algorithmic decisions are not fully automated. They often keep the human-in-the-loop and thus fall outside the scope of these protections. Furthermore, even when applicable, the legal requirements lack specificity about what is required (namely, meaningful information about the logic involved) and can compromise the value of this information (Busuioc, 2020).

In 2021, the European Commission released their long-awaited (and first ever) Proposal for a Regulation on a European Approach for Artificial Intelligence (European Commision, 2021). In what looks like a GDPR for AI:

> *"The regulation bans AI systems that cause or are likely to cause "physical or psychological" harm through the use of "subliminal techniques" or by exploiting vulnerabilities of a "specific group of persons due to their age, physical or mental disability." It prohibits AI systems from providing social scoring for general purposes by public authorities. It also precludes the use of "real-time" remote biometric identification systems, such as facial recognition, in publicly accessible spaces for law enforcement purposes."* (MacCarthy and Propp, 2021).

Because the EU's new AI regulation was not implemented until some time after the research for this dissertation was completed, it does not directly impact the research conducted and the findings that contribute to an improved understanding of the relationship between discretion and public digitalisation. Yet it still deserves to be mentioned, as a promising (if vague) approach towards regulating AI.

Besides legal concerns about data and their application, there may also be practical and ethical concerns. It is important to note that 'bigger' data is not always 'better' data, as discussed in Publication Two of this dissertation (Petersen, Christensen, et al., 2021). Larger volumes of data do not always enable diverse patterns to emerge if the data are suspect (boyd and Crawford, 2012). However large the dataset, if the data are misrepresentative, or in some other way poor, then the analysis will result in similarly poor results (Bergstrom and West, 2020). It might even matter that some data are unusable, unavailable, or unrecorded, since this will limit what systems can learn from. Resulting absences might raise more questions than answers. In any case, information is harder to capture 'accurately' in the wild, leaving questions about what should be measured in the first place (Pasquale, 2020). It is possible that processed data might also reflect societal biases, which could result in consistently negative outcomes for certain groups of people (e.g. Barocas and Selbst, 2016; Eubanks, 2017; Keyes, 2018). In the case of social work, profiling and predicting can have severe consequences for the lives of citizens, and especially if they do not fit into universal standards and 'match' the explicit assumptions made about them.

As noted by boyd and Crawford (2012), just because data is accessible (and processing of data is otherwise possible and legal), this still does not make it ethical. In recent years, ethical concerns have grown in the HCI and wider communities, particularly regarding issues such as fairness, accountability, and transparency[4], and lately, researchers have asked *"Who should stop unethical AI?"* (Hutson, 2021). There is still interesting work to be done in this area, and, as I argue

4 https://facctconference.org/

throughout this dissertation, much of it depends on the way we define the problem and how technology is seen as a solution (Petersen, Cohn, et al., 2021).

2.5 SUMMARY: IT'S A MATTER OF DEFINITION

This chapter has offered an overview of public digitalisation in Denmark, as seen mainly from a political perspective. In a political sense, digitalisation has been described as a means of achieving efficiency and legality within the public sector. However, from a different perspective, digitalisation might mean different things, and be used for different purposes. Following Wittgenstein[5], the meaning of words depend on the context or circumstances in which the words are used (Moyal-Sharrock, 2004). At the same time, the definitions we make about digitalisation, and words such as 'data', 'automation' and 'AI', can have major consequences for the way we think about the role of technology now and in the future. For example, 'digitalisation' and 'data' might mean something very different to the citizen than to a social worker or system developer. The term also covers a vast range of activities and changes, such as the work involved in 'making' something digital (Hockenhull, 2020).

The idea of thinking of words in terms of their multiple meanings is a central theme of this dissertation. Looking at different perspectives and acknowledging that they exist is an essential part of this. As argued in Publication Four of this dissertation (Petersen, Cohn, et al., 2021), it is important to consider and appreciate different perspectives in order to create fertile ground for alternative ways of thinking. In the same way, we can think of the multiple aspects of digitalisation, data, algorithms, automation and AI. For instance, there may be very specific uses of AI, but there exist many uses of AI, and different views of what constitutes AI in itself. Even in cases where it is not yet developed, it may already exist in how it occupies people's minds, making them act and react in specific ways to it – as is the case in Publication Two of this dissertation, where social workers hide information from the records in the fear that it might be used for predictive purposes in the future (Petersen, Christensen, et al., 2021).

In the following chapter, I further unpack this argument as I explore different concepts on discretion in the literature, and the ways in which different perspectives on discretion impact views of its relationship to public digitalisation. By employing an interdisciplinary approach, I intend to develop a more nuanced view on discretion and its role in public digitalisation than that which dominates the political discourse today.

5 Wittgenstein's linguistic turn is also considered an important influence on theory in CSCW and the disciplines that contributed to it, such as ethnomethodology and conversation analysis (Stahl, 2011).

CHAPTER 3: CONCEPTUAL REFLECTIONS

The purpose of this chapter is twofold. I begin by reviewing and reflecting upon the different ways in which discretion is conceptualised across a range of disciplinary perspectives. In recognition that each discipline has its own language, traditions, and research approaches, they address only a few of the many varieties in the relationship between discretion and public digitisation. In reviewing different perspectives on discretion, I want to assess the ways in which the relationship is perceived and subsequently performed, as part of scholarly debates. Due to my focus on the status and future relationships between discretion and digitalisation, I give emphasis to recent scholarly activity in this area[6]. Based on a reflection of the study of discretion, I propose an integration of discretion with CSCW studies on practice-oriented design and discuss how concepts from CSCW can contribute to a more nuanced understanding of the concept of discretion and its relationship to public digitalisation.

3.1 PERSPECTIVES ON DISCRETION

Discretion has been studied from a range of different perspectives, and as this section shows, the conclusions reached by previous literature are, in many ways, drawn on conceptual understandings from other disciplines (Evans and Hupe, 2020b). In previous studies on discretion and public digitalisation, discretion is mainly seen in terms of the impact of technology on the opportunity to act flexibly and responsively in practice. An often debated theme in this context is the question of whether the use of technology *reduces* or *enhances* discretion. In the following, I present three of the most common, but conflicting, views of discretion in the context of public digitalisation.

3.1.1 DISCRETION AS 'GRANTED' AND 'DENIED'

In their extensive review of disciplinary approaches to discretion, Evans and Hupe (2020) find that the most widely quoted definitions of discretion have their roots in the realm of law and justice. Legal ideas of discretion often provide jumping-off points for further analysis across disciplines – and among the most popular definitions is that of Davis (1969), for whom discretion is a failure of external control.

> *A public official has discretion where the effective limits on his power leave him free to make a choice among possible courses of action and inaction.* (Davis, 1969, p. 2)

According to this view, discretion refers to the decision space that exceeds the limits of formal authority. The law may sometimes require discretion, such as by obligating public officers to take individual circumstances into account when making decisions as part of a case. However, any discretion that is taking place outside the boundaries of rules is seen as a threat to the legal 'order', which should be constrained by 'filling gaps' in statutory standards and by using legal control instruments. Closely related to this view is the legal notion of 'justice'. Following Ross (2019), justice means that all citizens must be subject to and equal before the law, and any deviance from rules is therefore considered 'unjust', regardless of what the rules may be.

6 For an extensive literature review, please refer to the publications in Part Two of this dissertation.

The one-way communication (and shallow relationship) between discretion and rules also underlies Dworkin's well-known metaphor of discretion as the 'hole in the donut' or more specifically, as *"an area left over by a surrounding belt of restrictions"* (Dworkin, 1977, pp. 31-32). The dough stands for decisions prescribed by rules and the hole in the donut stands for the decisions that relate to situations to which the rules do not apply. As noted by Mascini (2020), the definitions offered by Davis and Dworkin are both based on the assumption that it is possible to clearly identify where the authority of a public officer begins and where it ends.

The legal perspective on discretion is often adopted by studies in public administration and public policy, to indicate the 'legitimate' space for public officials to make their own decisions about how public services are delivered (Evans and Hupe, 2020a). In this context, digitalisation is often presented as an opportunity to further reduce or remove the discretionary freedom of practitioners by automating law enforcement (e.g. Zeleznikow, 2000; Keymolen and Broeders, 2011; Cheraghi-Sohi and Calnan, 2013). The question is often not *if*, but *when* 'the robots are taking over' and how administrative workers adjust to a new reality where *"robots replace professional discretion"* (Justesen and Plesner, 2018, p. 9).

3.1.2 DISCRETION AS 'SUBJECTIVE' AND 'PROBLEMATIC'

The view of discretion as 'granted' has been challenged from a range of other perspectives. 'Street-level bureaucracy' theory (Lipsky, 1980), for example, challenges the assumption that rules are clear to operationalise and simply implemented by street-level bureaucrats. In his account of street-level bureaucracy, Lipsky emphasises the power of frontline workers to control the upward flow of information. As the 'human face' of public policy implementation, he argues, street-level bureaucrats effectively function as policy makers, as they respond to the needs that arise in practice (Lipsky, 1980, 2010). Lipsky's bottom-up approach to policy implementation became a classic and laid the foundation for a shift in the literature on discretion. It has been particularly useful in exploring how front-line employees may have more discretion than would be apparent at the time.

Studies from various disciplines and around the world adopt and extend the concept of street-level bureaucracy to capture common (and changing) features of the practice of street-level bureaucrats, such as police officers (Brockmann, 2017), nurses (Walker and Gilson, 2004), teachers (Taylor, 2007) and social workers (Rice, 2013). Terms such as 'system-level bureaucracy' (Bovens and Zouridis, 2002) and 'street-level algorithms' (Alkhatib and Bernstein, 2019) have also entered the vocabulary to give more attention to the increasing role of technology in public workplaces. Common to these studies is that they give attention to the *spaces* for discretion at the frontline.

What is often not considered in the application of street-level bureaucracy is how Lipsky perceived managers and frontline workers as belonging to distinct groups, having different priorities, values and commitments in their work (Hoyle, 2014). Lipsky often presents discretion as a problem that managers try (unsuccessfully) to control (Evans, 2015). According to this critique, Lipsky also sees managers as best placed as the key regulators of discretion, based on the view that they manage it in the interest of the organisation, while street-level bureaucrats are self-interested (Evans, 2010). Since the early days of Lipsky's work, discretion has mainly been considered at the level of the individual. The assumption that street-level bureaucrats are acting subjectively has largely been left unquestioned in the literature on discretion. Examples of

studies that assume discretion to be a subjective judgement include the works of Egelund and Thomsen (2002), Wallander and Molander (2014), and Møller (2016), who use vignettes of fictive cases on individual respondents to identify discretionary reasoning in social work. The first study by Egelund and Thomsen (2002) was undertaken in Denmark and involved 38 social workers who were asked to evaluate cases of children in vulnerable and potentially dangerous situations, as part of a questionnaire and follow-up interview. This led to different answers by the social workers and was consequently followed by a major critique in the Danish news, in which the discretionary practice of social workers was (incorrectly) criticised for its apparent subjectivity – but never examined as part of practice:

> *"Social workers judge more on the bases of their own attitudes and norms rather than assessing on the cases of professional knowledge, when examining whether a child should be removed from their parents."* (Walsøe, 2003).

In Publication One of this dissertation (Petersen et al., 2020), I argue that the view of discretion as 'subjective', 'self-interested' and 'unjust' has led to the widely-held belief that digitalisation can (and should) work as an efficient means to reduce the discretionary freedom of social workers and other street-level bureaucrats. As mentioned in the background section of this dissertation, the recent introduction of digital-ready legislation particularly supports this view, in that it aims to reduce the space for discretion by replacing 'subjective criteria' with 'objective criteria' (Justesen and Plesner, 2018).

Studies that adopt the view of discretion as a predominantly rule-guided behaviour are generally inclined to conclude that digitalisation has (and has had) a direct impact on the freedom to exercise discretion. Along these lines, a common assumption is that technology works to further restrict the discretionary freedom of street-level bureaucrats (Keymolen and Broeders, 2011) or make it redundant, as human judgements are no longer made at 'street-level', but are taken over by system developers during technology design (Bovens and Zouridis, 2002; Zouridis et al., 2020). In the same way, Busch and colleagues (Busch and Henriksen, 2018; Ranerup and Henriksen, 2020) introduce the concept of 'digital discretion' and suggest a shift from viewing discretion as a street-level practice to focus on the technologies used to influence or replace the discretionary practice of public service workers. However, as shown below, not everyone finds discretion to be reduced because of technological intervention.

3.1.3 DISCRETION AS 'COLLABORATIVE' AND 'IRREPLACEABLE'

In his case study on discretion, Evans (2010) found that even if management attempt to control and direct practice, the effectiveness of systems may be very limited in their capacity. Another study shows that technology is not simply a constraint to frontline discretion, but rather extends discretion, as it is unable to capture the informal dimensions of the decisions made by operators and thereby obscures their use of discretion (Jorna and Wagenaar, 2007). Moreover, it has been argued that rooting decision-making in a technology-driven practice ignores the complexity of actual decision-making in social work (Webb, 2001). For example, automation of work can elide or exclude important human values and necessary improvisations that depend on a narratively intelligible communication between people that is not reducible to software (Pasquale, 2019). Others find that, even in the case of fully automated processes, discretion still persists, as there may be uncertainty about the operation of an algorithm (Pääkkönen et al., 2020).

As noted above, a great deal of attention has been given to discretion and the rules and standards that influence it, but few have examined it 'on the ground', and as part of real cases. In the past few years, however, there has been a growing stream of research that adopts a broader view of discretion and examines it as part of practice. These studies are often less concerned with legal rules, and view discretion as influenced by 'action prescriptions' derived from various sources. For instance, my first publication investigates the uses of discretion as part of child protection cases in Denmark and finds that, in contrast to the formal accounts of discretion as a 'controlled' and 'subjective' (ab)use of freedom, discretion is better conceived as a collaborative achievement, influenced by the cooperation and negotiations made with various stakeholders (such as citizens, managers, and other professionals) (Petersen et al., 2020).

The concept of discretion as a collaborative achievement has since been supported by empirical findings from different, but related, studies on discretion and public sector digitalisation (e.g. Møller et al., 2020; Ranerup and Henriksen, 2020; Flügge et al., 2021). Together, these studies contribute to a step forward in proving a more nuanced discussion of discretion, its influences, and its uses. Having said that, we are still a long way from addressing – and acknowledging – the many aspects of discretion.

As noted by Evans and Hupe (2020a), the dominance of certain perspectives on discretion risks crowding out others; assuming certain problems to be the right ones to be solved and requiring a specific approach. Recent studies have helped to challenge the dominant views of discretion, as addressed throughout this chapter. Notably, the question of the controllability and subjectivity of discretion is increasingly being raised by critical studies on public digitalisation. However, the assumptions that underpin much of the traditional work on discretion are rarely challenged. A commonality exists between the different strains of research in the way discretion is viewed through the lens of *the freedom enjoyed by an individual to alter prescriptions in response to practical circumstances.* In other words, the *discretion* of street-level bureaucrats is not considered as a collaborative practice or as part of a design process.

I now turn to concepts from CSCW that I have found useful to address this and related aspects of discretion, which are still not well understood or conceptualised.

3.2 SETTING UP DISCRETION WITH CSCW

The CSCW community has generally paid little attention to discretion and social work as practice. On the other hand, CSCW has long been dedicated to improving our understanding of cooperative work and exploring the design of technologies with explicit concern for their intended users. In the following section, I argue that concepts used in CSCW research can also be applied to research on discretion in social work. Additionally, I will discuss how a CSCW approach to discretion can contribute to a more nuanced understanding of discretion in relation to public digitalisation, by recognising the influence of the broader context in which discretion is embedded. Specifically, I will demonstrate how my research integrates and builds upon studies of discretion with CSCW studies related to plans and situated actions, invisible work, classifications, co-design, and values in design.

3.2.1 'MAPS' AND 'SCRIPTS' AND SITUATED ACTIONS

In CSCW, the need to know more about cooperative work dates back to the 'office automation' movement in the 1970s and a recognition of the lack of knowledge about how groups work and about how technology and standards affect them. At this time, researchers in cognitive science perceived action as simply being routine activities and repeated execution of planned procedures (Randall et al., 2007). However, by paying attention to the handling of 'exceptions', CSCW studies demonstrated the necessity for practitioners to deviate from plans in order to get work done. In 'Plans and Situated Actions', Suchman (1987) famously suggested that plans may serve in the interest of *what* things should come to, but not *how* they should arrive there.

> *"Plans are resources for situated action but do not in any strong sense determine its course."* (Suchman, 1987, p. 52)

Suchman's conceptualisation of plans was seen as an eye-opener in CSCW and led many to the interpretation that systems should function as 'maps' that orient users, but in no way specify the steps towards an accomplishment of their tasks (Cabitza and Simone, 2013). It also led to a reluctance towards designing systems that regulate coordinative activities (Schmidt, 1997).

In a detailed discussion of Suchman's work, Schmidt (1997) argues that plans (or what he refers to as 'formal constructs') may play a weak role as a 'map', but depending on the situation, they may also play a strong role as a 'script' where they serve as instructions to actors of possible or required next steps. By analysing situations where formal constructs are defined and used, he shows that in some settings they are routinely applied as unproblematic guidelines or instructions, and, in these cases, they determine actions in a far stronger sense than that of a map. In other words, formal constructs in themselves are not fixed, but situated just like actions (Christensen, 2013).According to Schmidt (1997), the understanding of whether formal constructs serve as a map or a script depends on the extent to which it is possible to identify, analyse and model interdependencies in advance. Furthermore, Schmidt argues that this is not immediately obvious to the researcher, but always internal to the particular practice and *"left to the persons whose task it is to decide such matters"* (Schmidt, 1997, p. 383).

In the publications included in this dissertation, the concepts of 'maps', 'scripts' and situated actions have been found useful to help make sense of the diversity, multiplicity and (sometimes) vagueness of formal constructs in social work. It is also reasonable to suggest that the current automation agenda as we see it unfold in the Danish public sector has certain parallels to the office automation movement and may be seen as an expansion of the 50-year-old dream. As further noted by Ames in her study of 'charismatic technology', *"the same kinds of promises have been made over and over, with different technologies"* (Ames, 2015, p. 10). Visions, utopia, promises and hype have long been produced about how digital transformations may unfold in the public sector and beyond – and in ways that risk shutting down alternative paths (Jirotka et al., 2017). Suchman's notion of situated actions is striking in that it provided a counter to the view which maintains that goals define actions in a straightforward way (Blomberg and Karasti, 2013). Nonetheless, the notion of situated action and the concepts of 'maps' and 'scripts' do not provide insights on discretion and the complexity and uncertainty that characterises social work practice. As a consequence, the concepts become somewhat rigid when applied to these cases: Suchman rejects the specificatory role of formal constructs altogether, while Schmidt suggests that we have a rather binary way of consulting them.

Based on my analysis in Publication One (Petersen et al., 2020), I suggest that it may not be a question of determining the role of formal constructs *beforehand*, but instead of allowing street-level bureaucrats to use them flexibly as a 'map', 'script', or something in between, depending on the situation.

In Publication Three (Petersen, manuscript), I further build on the incongruence between plans and situated actions by examining the discretionary values of street-level bureaucrats as part of a participatory design setup. CSCW research has long paid attention to what it means to 'follow a plan'. In this paper, I seek to bring attention to the significance of discretion in the process of 'making a plan'. More specifically, I provide empirical insights into the assumptions brought into a design process in a Danish municipality and what happens when they meet the lived realities of social workers, as they become involved as experts in their own experiences. Going into the design project, the idea from the municipality was that a case process includes steps beyond the law and that these could be discovered and digitalised by bringing in the perspectives of social workers. However, the social workers questioned whether the process existed at all. In this case, it was thus not enough to think of different ways to reach an end goal (Suchman, 1987; Schmidt, 1997; Suchman, 2007). Instead, it gave rise to re-thinking of the whole idea of the process.

3.2.2 'INVISIBLE WORK' AND CLASSIFICATIONS

The concept of 'invisible work' originally emerged from feminist scholarship in the 1980s, to bring sociological attention to work that was unpaid, unrecognized and undervalued (DeVault, 2014). The concept has since evolved and spread from the home to the workplace. The interest in 'invisible work' was brought to the CSCW community because of its relevance in the design of technologies.

CSCW studies of 'invisible work' have long proved seminal in amplifying our understanding of professional work and useful in giving voice to the performance of tasks that are often left unacknowledged or unnoticed by others (e.g. Bowers et al., 1995; Suchman, 1995; Bowker and Star, 1999; Martin et al., 2007; Møller and Bjørn, 2011; Matthiesen and Bjørn, 2017). In the context of public administration, divergence from bureaucratic order is typically treated as non-compliance. However, studies of invisible work help us to suggest that a bureaucratic rule saying that something should be done may change the produced account of that work – while the work itself may remain the same (Rawls, 2010). As noted by Garfinkel (1967), there may be 'good reasons' to work around formal systems. In his view, it is the 'looseness' of manuals (like rules) that allows their generalised meaning to be appropriated for particular contexts.

Building on these insights, Suchman (2007) and Schmidt and Wagner (2003) argue that prescriptive technologies achieve their efficacy not despite, but because of, what they leave unspecified. For example, Martin et al. (2007) find that work requires continuous in-situ decisions and workarounds by operators, which, among other things, involve the creation of new categories. These may be valuable and crucial to the actual conduct of the work process – yet they are not visible outside their context of use (Martin et al., 2007). In the CSCW community, these categories have become known as 'residual categories' (i.e. 'other', 'nowhere else classified' categories).

Residual categories are not represented within any given classification system; yet classification systems often have to rely on residual categories to render themselves complete (Matthiesen and

Bjørn, 2017). For example, in their analysis of the International Classification of Diseases, Bowker and Star (1999) point to the contingencies and contests that went into the classification of viruses and the surprising non-existence of 'old age' as a formal cause of death. Research in hospitals also shows that 'subtle categories' are used to identify patients with potential cancer (Møller and Bjørn, 2011). These include phrases and concepts like *'patient lost 20 kg'* or *'weight loss'*. Both create a definition that is *not* supported by the 'formal' categories, which typically presume that the existence of cancer is 'clear'. Uncritical reliance on technology might therefore hide the complexity of real-world (and real work) decision-making (Matthiesen and Bjørn, 2017). According to Bowker, technologies affect what will, and what will not be *made visible* (Bowker and Star, 1999). Ultimately, they "*operate through being invisibly exclusionary*" (Bowker, 2005, pp. 12-14).

The concept of invisible work, as work made invisible by others than those performing it, led many CSCW researchers to attribute issues of visibility to the technologies and conclude that we need to build systems that are better at taking into consideration 'invisible' practices, based on the implicit view that systems essentially *shape* what is made visible and what is not (e.g. Suchman, 1995; Star and Strauss, 1999; Møller and Bjørn, 2011; Boulus-Rødje, 2018; Høybye-Mortensen and Ejbye-Ernst, 2018). However, with recent advances in AI, information can now be organised in more flexible ways. Bits of data can have multiple associations with other data, and categories can change over time (Gillespie, 2014). Thus, this dissertation argues that it is no longer sufficient to say that systems are simply 'incomplete' or unable to support people in doing their tasks. For instance, residual categories about age (Bowker and Star, 1999) and weight loss (Møller and Bjørn, 2011) may not be formally specified by practitioners, but this does not in itself exclude them from being included in the treatment of a patient. With current AI technology, their meaning may be derived from other patterns in the data, and they may still be considered as a cause of death or a sign of cancer.

Still, even with more flexible forms of databases, classification and categorisation remain vitally important today. There is still a premediated order that is necessary for algorithms to work, in that information must be formalised so that algorithms can act on it without any regular human intervention or oversight (Gillespie, 2014). Attributes like someone's 'real' age may be appropriately formalised and objectified in machinery, but research shows that challenges quickly emerge when the existence of stable explanations is taken as given (Sendak et al., 2020). Additional value may also be added in the interaction between people, which could cause problems to computers, as they cannot *experience* the world as human beings and the dynamics involved in these contexts (Dolata et al., 2020). It is also significant for technology design that *"if a description is not there, then intentional actions under that description cannot be there either"* (Hacking, 1985, p. 166).

In the case of social work, transparency of information is not merely a matter of reporting or disclosing information about an already existing description of a particular citizen. It also creates the person it seeks to make transparent (Flyverbom, 2019). Technology, then, becomes a crucial shaping element in that it helps to bring people into being (Berg, 1998). It may also intensify social processes of classification and control (Campolo and Crawford, 2020). In this view, to classify is highly consequential for those who are being classified – and especially if they do not fit into universal standards and 'match' the explicit assumptions made about them.

In Publication Two of this dissertation (Petersen, Christensen, et al., 2021), I share social workers' concerns about these matters, as they choose not to write down their informal classifications about citizens in a job centre. As previously mentioned in this chapter, the social workers fear how sensitive information about citizens might be interpreted and perpetuated when stored by

algorithms and might thus 'stick' with people for too long. For these reasons, while documentable and traceable to AI, the official records in the job centre are left without a fundamental understanding of how decisions are actually made. In light of the findings obtained from the study, this dissertation suggests an expansion of the concept of 'invisible work' to focus not only on the work made visible by technologies, but also on the work that is intentionally kept invisible from datasets (Petersen, Christensen, et al., 2021). Notably, recent research from the healthcare sector points to similar issues and introduces the concept of 'invisibility work' to capture how street-level bureaucrats exercise discretion to *preserve* the invisibility in their work, in contrast to the well-established notion of 'invisible work', which refers to work made visible by *others* (Petersson and Backman, 2021).

Work that is made invisible from the record, and the data used by technologies, also reflects the values brought into the design of technologies. As I will discuss next, value-related concerns represent another key focus for CSCW studies and for the research conducted for this dissertation.

3.2.3 CO-DESIGN AND VALUES IN DESIGN

CSCW research has long reminded us of the partial views held by different stakeholders, and in particular, that the voices of users are regularly silenced (Suchman, 1995; Randall et al., 2007). It is thus the aim of CSCW, and especially Participatory Design, to involve users and incorporate their values throughout the design process (Wagner, 2018). The design process is seen as an important phase for fostering value alignment between stakeholders (Paanakker, 2020) and the use of multiple perspectives is increasingly emphasised as critical to success (Blomberg and Karasti, 2012; Baumer, 2017; Khovanskaya et al., 2017). Recently, CSCW findings from a participatory design workshop revealed that, when asked to describe the value of algorithmic decision-support systems, social workers in a job centre had a different notion of value than the one outlined by the municipality. The municipality expected to focus on profiling individual citizens, whereas the social workers pushed for systems that could help to clarify case processes internally (Møller et al., 2020).

Research also shows that even in cases where values are shared between stakeholders, their logics might still conflict. Different stakeholders might value different things or assign different values to the same thing, based on their perspective (Voida et al., 2014). For example, they might not have the same assumptions and views about what are the best practices for helping citizens (Boulus-Rødje, 2019). Similarly, Boulus-Rødje's previous findings from a welfare context show that technology mainly works to support compliance with policies, while providing limited support to the knowledge practice of social workers (Boulus-Rødje, 2018). In the same direction, my research and related CSCW research is asking for a better understanding of the values of street-level bureaucrats and the lived experiences of citizens, as part of the design of public policies and technologies (Boulus-Rødje, 2019; Møller et al., 2020; Petersen et al., 2020; Petersen, Christensen, et al., 2021). Arguably, this is becoming even more crucial, since laws, policies and other standards move through increasingly advanced technologies that often alter the decisions made by street-level bureaucrats, or make them on their behalf.

> *As algorithmic decision-support systems are becoming increasingly common, the practices that shape the available dataset are important to understand in order for systems designers and data*

> *scientists to work through the structuring of data in a way that is sensitive to practice and how the data was produced in the first place.* (Møller et al., 2020, p. 3)

Looking at the public sector and beyond, current automation and AI-based systems are often driven by economic incentives and efficiency ideals, and they are routinely designed to profile people and predict their futures (Persson et al., 2017; Ranerup and Henriksen, 2019; Campolo and Crawford, 2020; Møller et al., 2020; Pasquale, 2020). They are often used to draw normative distinctions between people and may also reflect biases in society (Barocas and Selbst, 2016; Eubanks, 2017; Rieder, 2018). In some situations, technologies may also become solutions to what are, in reality, social and political problems (Beich, 2019). I directly touch upon these issues in Publication Four of this dissertation (Petersen, Cohn, et al., 2021) as my co-authors and I problematise the current ideals driving public digitalisation in Demark and call for a more open-ended approach to AI design in political contexts, which would allow multiple perspectives to enter the process.

Nevertheless, as public administrations increasingly embrace automation and AI (such as in Denmark), critical perspectives often get lost in the process, and the work going into producing training data goes unaddressed. There is, as we have seen, an extensive literature concerned with the values of street-level bureaucrats as they implement policies and deploy technologies in practice. However, research in this area finds that the values of street-level bureaucrats, such as their autonomy when making decisions, are often excluded from design decisions (Palacin et al., 2020; Saxena et al., 2020). In Denmark, several studies have examined value positions in national strategies and technology design, and more recently, in the case of automated decision-making making in social services (Rose et al., 2015; Persson et al., 2017; Ranerup and Henriksen, 2019). These studies all find legal compliance, service quality and workflow efficiency to be the most pervasive value positions from the perspective of managers and politicians. However, these studies also build on pre-defined values and consider only the perspectives of politicians and managers. As noted by Arildsen (2019), we are yet to have a discussion on whether these are the 'right' values.

Publications Two and Three of this dissertation attempt to fill the gap in the existing literature on discretion, by empirically investigating street-level bureaucrats' uses of discretion during the design of new technologies.

In the second publication, I explore the discretionary judgements made by social workers as they determine the needs and support of welfare seekers in a Danish job centre. My findings show that, for practical purposes, social workers accommodate formal categories by creating their own classifications about citizens (such as 'he smells of alcohol'). For moral reasons, the social workers choose not to write down these classifications. According to the social workers, the meaning of classifications depends on the context of use, and they express deep concern about how information might be interpreted and perpetuated when stored by algorithms and 'stick' with people for too long. This study shows that the problem of implementing AI and other emergent technologies might not only be to do with the technology itself, as previous research suggests, but might also be a human question about what data is (and should be) made available for datasets (Petersen, Christensen, et al., 2021).

Last but not least, Publication Three (Petersen, manuscript) demonstrates what happens when street-level bureaucrats enter a co-design process and the opportunities that arise from this experience, all pointing towards how we can design systems that better support their

coordinated practices, which has always been at the core of CSCW research, across the concepts listed in this section.

3.3 TOWARDS A CSCW PERSPECTIVE ON DISCRETION

My goal in this chapter has been to present different perspectives on the concept of discretion in relation to public digitalisation. Across academic and public debates, discretion and public digitalisation are often seen as opposing concerns and competing interests. Based on a combination of studies on discretion and CSCW research on practice-oriented design, I have argued that we should take into account multiple and overlapping perspectives when understanding discretion as a concept and its role in public digitalisation. Discretion cannot simply be viewed as a space of freedom determined by rules and standards, often further influenced by technology. Neither is it a subjective endeavour, in which no one but the individual practitioner is involved.

On these premises, this dissertation includes publications that discuss the different elements of discretion addressed in this chapter, at the interface between a 'happy marriage' and an 'ugly divorce' between discretion and public digitalisation. Thus, each publication builds upon, diverges from or expands on elements provided in the conceptual reflections above. By contemplating the multiplicity of discretion, I wish to transform the concept from one that sees the relationship between discretion and public digitalisation as singular, to one that considers the possibility of adversarial relationships.

In this chapter, I have shown how an interdisciplinary CSCW approach to discretion can contribute to a more nuanced understanding of discretion and its relationship to public digitalisation. More specifically, CSCW, due to its practice-based nature, can significantly contribute to current perspectives on discretion by continuing to build foundational research and insights on work practice, collaboration and co-participation in organisational settings where public digitalisation is embedded. In CSCW, studies of plans and situation actions help to explain the diversity, multiplicity, and vague nature of formal constructs. Studies of invisible work and classifications can bring attention to discretionary work, which is often undervalued and unrecorded. Last but not least, studies on co-design and values in design can contribute to the meaningful involvement of street-level bureaucrats, such as social workers, in the design process.

My chapter also discusses how CSCW as a field of study can benefit from including the concept of discretion in the study of collaborative work and technological support. Incorporating discretion into CSCW will allow this field to gain a greater role in public digitalisation and technology design in general. Inquiry focused on discretion can provide relevance to work practice and CSCW researchers' expertise and bring new relevance to the field. The matter of discretion belongs to a broader practice, upon which we cannot comment without examining in its context the practices to which it belongs. CSCW can help to find a realistic role for public digitalisation in the contexts examined, and perhaps more generally, by combining insights into what is possible (technologically) and what is desirable (practically). CSCW provides knowledge on how to build systems, what should and should not be included, and what can be done to make it useful. These are all valuable insights for studies on discretion in the public sector.

Finally, this chapter shows how CSCW can also reinvent itself by integrating discretion into the core of the scholarly discussion. Bringing CSCW attention to the study of discretion and public digitalisation can help to expand the analytical scope and range of CSCW scholarship. Based on the perspectives presented in the previous sections, this dissertation contributes to a CSCW perspective on discretion in the following ways:

1. My dissertation expands the notion of situated actions and the concepts of 'maps' and 'scripts' to provide empirical insights on discretion and the complexity and uncertainty that characterise social work practice. My findings suggest that it may not be appropriate to determine the role of formal constructs in advance, but rather that street-level bureaucrats, such as social workers, should be allowed to use them as a 'map', 'script', or somewhere in between, depending on the situation. Thus, I argue that there is certain complexity to social work and discretionary practice that require a more nuanced approach to previous studies on plans and situated actions.
2. My dissertation also builds on the incongruence between plans and situated actions by examining the discretionary values of street-level bureaucrats in a participatory design setup. As a result of empirical insights, I shift analytical attention from different paths to an end goal (when 'following a plan') to designing processes that reflect people's desired outcomes (when 'making a plan').
3. Using the concepts of 'invisible work' and 'classifications', my dissertation also expands the scope of work that other people make invisible, to explore how street-level bureaucrats exercise discretion to keep their work (and classifications) invisible to others.
4. Finally, I extend the work on co-design and values in design by empirically exploring street-level bureaucrats' articulation of discretion when designing new technologies. In doing so, I challenge the widespread tendency to place street-level discretion at the end of technology, by considering discretion as an integral part of design.

Having reviewed the concepts used in this dissertation and discussed my conceptual contributions to CSCW, I will present the research design and methods used for my empirical studies, followed by a discussion of the major findings of each study.

CHAPTER 4: RESEARCH DESIGN

> *"The representations ethnographers create, accordingly, are as much a reflection of their own cultural positioning as they are descriptions of the positioning of others."* (Suchman, 1995, p. 62).

Throughout this chapter, I will describe the research undertaken, including the field of study, the nature of the project, the site of the research, and the methodology used to obtain data for analysis. I will elaborate on how my research has evolved, in an effort to show how a study initially considered exploratory has evolved into a variety of research interests and tasks. This involves a reflection on how my own position has changed with respect to the field and others, as well as how this has affected my work.

4.1 RESEARCH DISCIPLINE

The work presented here belongs to the tradition of Computer-Supported Cooperative Work (CSCW). As its name implies, CSCW is devoted to the study of how people work together and how technology might be designed to support their work (Schmidt and Bannon, 1992). CSCW was formed in 1984 in response to concerns about collaborative uses of technologies at work, and the need for interdisciplinary approaches to technology development that took into account the intended users of technology (Schmidt and Bannon, 2013). Based on insights from early ethnographic studies (e.g. Harper et al., 1989; Bentley et al., 1992), it was becoming clear that supposedly 'routine' tasks can be complex and that the informal practices of office workers are difficult to capture, even at the 'lowest' level of organisations (Bannon and Schmidt, 1989). The realisation also arose that in order to design technologies to support users in their communication and coordination with colleagues, it was crucial to study actual work practices in real-world settings (Schmidt, 2011).

In the 1980s and 1990s, the insights from early studies triggered the 'turn to practice' in CSCW and the surge of ethnographic and similar workplace studies (Schmidt, 2011). During this period, it was considered a key goal to demystify technological determinism and present its limits by emphasising the importance of the human labour 'behind' the cameras (Lewkowicz and Liron, 2019). This was made possible as social scientists began to work with computer scientists to solve problems, which had not been seen before. As previously mentioned, Suchman's (1987) study of plans and situated actions was also thought to be eye-opening in this regard and the conclusions reached by this and similar studies had an influential impact on the design process and future research endeavours. Thus, in CSCW, the technology itself is not a contribution to research - rather, what is essential to the field is knowledge about how to build the technology, how to include it, how to exclude it, and what can be done to make it useful in practice.

Since the early days of CSCW, the practice approach has been embraced by several researchers and proven useful in the development of technologies across disciplinary fields (Blomberg and Karasti, 2013; Schmidt and Bannon, 2013; Lewkowicz and Liron, 2019). Following the interdisciplinary nature of the CSCW field, research often draws on knowledge from a broader area of academic disciplines in order to address different aspects of work. In addition to CSCW, my dissertation also draws on knowledge from other fields, such as human-computer interaction (HCI), sociology, science and technology studies (STS), ethnomethodology, participatory design (PD), public administration, political science, and computer science (CS). In various ways, these

fields have contributed to my conceptual and empirical understanding of discretion and its relationship with public digitalisation. Having discussed the conceptual aspects of my work in the previous chapter, this chapter will go into greater details on the methodological aspects of my work.

In an effort to lay the groundwork for my methodological choices, however, I first want to provide some more context by considering important aspects of the research setting in which my studies took place. As noted by Bjørn and Boulus-Rødje (2015), one of the main differences between CSCW then and now is the increasing involvement of interdisciplinary researchers, who collaborate in increasingly complex settings and across multiple sites of design. As for my research, it was part of a large, interdisciplinary research project in which the collaboration between various stakeholders influenced how knowledge was acquired, integrated, and used. The following sections provide more details about these aspects.

4.2 RESEARCH PROJECT

The research for this dissertation has been undertaken in the context of the research project 'EcoKnow'[7]. The EcoKnow project, running from 2017 to 2021, consists of four work packages (WPs) and three-stage cycles, and brings together a diverse range of academic and industrial stakeholders. These include universities, municipalities, social work representatives, digitalisation consultants, and lawyers.

The problem that drove the EcoKnow project was defined in its project plan from 2017 as: constantly changing regulations in the Danish public sector on one hand, and the rigidity and inflexibility (at that time) of technological systems on the other. Against this backdrop, the intent of EcoKnow was to integrate ethnographic methods (WP1) and understandability studies (WP4) into the design of 'Effective, co-created, and compliant adaptive case management for knowledge workers' in two Danish municipalities.

More specifically, EcoKnow wanted to explore whether rule-based modelling (WP3) and data mining of case logs (WP2) could 1) allow the municipalities to digitalise rules and provide a better overview of the available paths through casework (while still being legally compliant) and 2) support an overall aim of increasing the perceived quality of case processes from the perspectives of social workers and citizens, who were involved as co-designers in the project. These foci were to be empirically investigated across the large team of interdisciplinary researchers and industry partners as a starting point for design.

My role in the research project, as part of WP1, was to contribute with ethnographic insights on work practices and design recommendations. I did this in collaboration with my supervisors, two of whom (Lars Rune Christensen and Naja Holten Møller) were involved in fieldwork, while the third (Thomas Hildebrandt) is the Principial Investigator overseeing the project and municipalities.

7 EcoKnow.org

4.2.1 INTERDISCIPLINARY COLLABORATION

In doing ethnographic studies in the context of CSCW, my research focus is on the ways in which work is accomplished in collaborative settings. In this dissertation, my main interest is in the social workers ´in the municipalities, whose work I sought to understand and whose interests I wanted to protect. My research was related to, but not determined by, EcoKnow's attention towards legal compliance. Instead, the nature of technological support was considered an open question in my work. The value of this approach will be explained further in section 4.3 on the methodological approach. However, it is worth noting here that, in addition to the perspective of social workers, I am attentive to the multiple perspectives involved in the EcoKnow project. When working collaboratively across disciplines and with practitioners in the field, my conception of responsibility is not fixed. Rather, it is based on a complex set of factors that manifest themselves in different ways.

In interdisciplinary collaboration, different knowledges inform the research processes in various ways and may also carry different understandings of what is considered the problem at hand, what approaches seem appropriate, and, in this case, how technology is seen as a solution. Thus, I am mindful that while the perspective of users is important (and often overlooked), it is also a peculiar one (Randall et al., 2007). It is an expression of certain interests that may conflict with opposing interest and may lead to discussions concerning a compromise. Hence, while it is important to take up social workers' perspectives and grant authority to their views, it is also vital to contextualise their experiences and compare them to other people's (Becker, 1967). This fits with the interdisciplinarity that is central to CSCW and its attempts to bring together social science and computer science in a joint effort to understand the nature of work with the aim of designing technology to support it (Schmidt and Bannon, 1992).

Leveraging on years of work on the difficult 'gap' between ethnography and design (e.g. Plowman et al., 1995; Forsythe, 1999; Dourish, 2006; Blomberg and Karasti, 2013; Schmidt and Bannon, 2013; Khovanskaya et al., 2017), and the multiple sites of design (Bjørn and Boulus-Rødje, 2015), I came to know the process of interdisciplinary collaboration as a continuous 'process of negotiation' (Winthereik et al., 2002). Meanings were not fixed, but emerged during conversations across disciplines and with practitioners in the field, as everyone made sense of their own and others' experiences. For example, people might use the term 'discretion' as if it were one thing, yet simultaneously mean very different things by it.

Accordingly, it is when we learn about the experiences of others that we bring to light the assumptions they are making, and by this process, create a site for conversations and negotiated meanings (Neff et al., 2017). As noted by Ang (2011, p. 790), *"A complex problem can only be addressed partially, through an ongoing and painstaking negotiation with its multiple aspects, the different ways in which it is perceived, and the divergent interests and perspectives involved."*

Following the reflections addressed so far in this chapter, I will now discuss the methodological approach I used in my research, after providing some details about the settings in which my studies took place.

4.3 RESEARCH SETTINGS

My research spans multiple research sites, due to the interdisciplinary nature of the EcoKnow project. I am, however, primarily responsible to the social workers in the two municipal settings, for whose benefit I am asking my research questions and developing my methodology. Therefore, the main research sites for this dissertation are the municipalities, namely 'Syddjurs Municipality' and 'Gladsaxe Jobcentre'.

4.3.1 SYDDJURS MUNICIPALITY

The first part of my fieldwork was conducted in Syddjurs Municipality's administration building in a small town in Jutland, Denmark. Syddjurs Municipality is a combination of the previous municipalities of Ebeltoft, Midtdjurs, Rosenholm and Rønde. The administration building in Hornslet is responsible for helping vulnerable children and families with special needs to get support. The building consists of four departments and 170 employees: 1) a family department with social workers, psychologists, therapists, healthcare assistants and an administration team, 2) a digitalisation and IT department, 3) an administration unit for school and day care facilities, and 4) an economic secretariat.

Syddjurs Municipality was already known as a frontrunner in public digitisation when they entered the EcoKnow project in 2017, and they had previously experimented with digital services and automated processes in areas unrelated to child protection services. Their technological infrastructure was highly influenced by locally developed solutions, and at the time of conducting fieldwork, they did not have a case management system in place. They had previously used an 'off the shelf' solution, but discarded it in 2013, as it did not support their existing infrastructure. Instead, the social workers used 'Acadre', a document management system, which supported them in storing and organising case notes but did not provide any process support.

When fieldwork began, the goal was to integrate rule-based modelling and process mining from EcoKnow into a locally developed case management system. This would support social workers across all cases in the family department, starting with one process at a time. Around this time, it was decided during a meeting between the municipality and the EcoKnow project to focus on two legal case processes as basis for fieldwork and design. One is referred to in §42, the law on social services, as 'loss of earnings'[8] (in Danish, 'tabt arbejdsfortjeneste') (Hørby, 2015), while the other concerns placement of children outside the home[9] and covers a wider range of legal paragraphs, depending on the consent given in the individual case and a number of other factors. Equally, 'loss of earnings' cases may also involve other legal paragraphs and begin with, lead to or follow other process simultaneously as they are being processed. Nevertheless, the reason for choosing 'loss of earnings' and 'placement of children' cases was based on the high volume of

8 'Loss of earnings' cases are legally defined as follows: *"The municipal council shall pay compensation for loss of earnings to persons maintaining a child under 18 in the home whose physical or mental function is substantially and permanently impaired, or who is suffering from serious, chronic or long-term illness. Compensation shall be subject to the condition that the child is cared for at home as a necessary consequence of the impaired function."*

9 Placement of children outside the home involves a number of legal paragraphs, and includes cases where children are placed outside the home (either part-time or full-time and with family members, foster families, or in their own place – depending on their age and many other factors determined by the concrete circumstances of the case).

these cases and the complexity involved in such decisions. It would allow fieldwork to cover a broad area of cases, by looking into both routine tasks and complex ones without clearly defined problems or solutions.

Syddjurs Municipality is where I conducted most of my fieldwork. From 2017 to 2019, I visited and re-visited the site multiple times and developed a close relationship with the participants, who were happy to cooperate and make themselves available for follow-up questions and multiple rounds of interviews and observations. I also got to know the employees managing the relationship between the EcoKnow project and social workers well, and, among other things, I was given access to their local systems based on confidentiality agreements and was frequently invited to take part in internal meetings, informal discussions, and team events.

4.3.2 GLADSAXE JOBCENTRE

The second part of my fieldwork took place in Gladsaxe Jobcentre and was initiated in Spring 2018. The job centre is part of Gladsaxe Municipality, near Copenhagen, in the capital region of Denmark. The role of job centres in Denmark is to provide a unitary employment system offering one-stop access to all citizens. Their main task is to establish a quick and efficient match between job seekers and companies (Danish Agency for Labour Market and Recruitment, 2018). At the time of conducting my research, Gladsaxe Jobcentre consisted of 240 employees, including a head of employment, administrative staff and four departments handling cases concerning cash benefits: 1) allowances and availability, 2) jobs and companies, 3) jobs and competencies, and 4) jobs and resources. Social workers in these departments consisted of a small number of trained social workers and a large group of social workers with different backgrounds. These included previous experiences as sales managers, graduates, and previously unemployed individuals. All social workers attend mandatory courses, but no prior experience in the field is required.

The municipality is a known frontrunner in adopting new technology to automate or support decision-making activities and has previously experimented with AI in areas unrelated to unemployment. Known as the 'Gladsaxe model', they had previously developed a profiling system to detect early risks of children in vulnerable families. The project, however, was heavily criticised, and in 2019 it was denied permission from the data protection authorities and put on hold (Chiusi et al., 2020). In the job centre, the social workers worked for a few years before transiting to a new case management system, replacing an old technological infrastructure. The case management system supported social workers in all aspects of their work, but did not offer any AI component. Based on wishes expressed by the job centre management, it was decided that the EcoKnow project would look into the opportunities of using predictive AI in their welfare benefits cases. Before fieldwork began, meetings were also held between the job centre management and EcoKnow project staff to decide on the focus of inquiry, and it was decided that attention should be given to social workers handling cases concerning cash benefits, as described in detail below. These cases were chosen for reasons similar to that of Syddjurs Municipality: they are high in number and often complex, thus calling attention to the need for careful examination before considering the introduction of AI.

In cases concerning cash benefits, it is a legal responsibility of the social workers in job centres to decide whether a person seeking cash benefits can take a full-time job within three months of unemployment. If the answer is yes, the person is placed in a 'ready to work' match group, also legally known as '6.2'. If the person faces challenges beyond unemployment and is found to be

(currently) unable to work, they are considered 'ready for activation measures' and placed in match group '6.3'. Activation measures are designed to get people 'job ready' and may include training courses to assess work capability and skills. If neither of these is the case, or if the applicant is below the age of 30, they do not meet the requirements for cash benefits and may be put into one of 12 additional match groups as per the Danish law of active job creation effort (Beskæftigelsesministeriet, 2016).

My involvement with the job centre was different from that of the family department in Syddjurs Municipality, in that I conducted my fieldwork there for a shorter amount of time and did not develop the same close relationship with the participants, apart from follow-up conversations to discuss my initial observations and re-affirm my interpretations. Still, I experienced a high level of cooperation from the participants, who were very open to engage and offer their time and expertise for the purposes of my research efforts from the outset.

4.3.3 COMPARABILITY OF RESEARCH SITES

The value of doing fieldwork in both municipalities as part of my dissertation is to get a broader and more diverse understanding of practices across settings. In this dissertation, however, I am interested in design for specific contexts rather than scale and generalisability.

Although both municipalities are in the area of social services in Denmark and both are subject to public digitalisation efforts, they also have differences, which are important for interpreting empirical findings. The main differences between Syddjurs Municipality and Gladsaxe Jobcentre are seen not only in terms of the nature of cases and the things that influence them, such as the legal framework and organisational standards, but also in terms of the professional background of practitioners and whether and how that matters for technological support of their work.

One must be a trained social worker to work in the family department of Syddjurs Municipality. In Denmark, social workers are characterised as those having successfully completed a professional degree in social work: an education involving both theoretical and empirical knowledge of child protection services and legal regulations in the field. In Syddjurs Municipality, the social workers who participated in our studies had several years of professional experience and many of them had been working in the municipality for up to ten years. Previous research finds that the more professional social workers are, the more likely they are to be negative towards any influence on their ability to exercise discretion (Busch et al., 2018). This was indeed the case with the social workers in Syddjurs Municipality, who had deep knowledge of everything related to their work and often expressed frustration with outside influences, such as technological support.

On the other hand, participants from Gladsaxe Jobcentre were mostly social workers without a professional degree. The job centre was characterised by a high employee turnover, and based on conversations with the social workers, many of them considered their jobs to be temporary and they rarely stayed in the job centre for more than two years. The various backgrounds of social workers, such as sales managers and graduates, are not unique to this particular job centre. Recent numbers show that only four out of ten employees in Danish job centres are trained social workers (Lauth, 2016), adding fuel to the political debates in which casework is often seen as an 'arbitrary' function, rather than a 'fully-fledged' profession (Møller et al., 2020; Petersen et al., 2020). Similarly, a study from a Danish job centre shows how this leads to increased bureaucratisation of the c social worker and a feeling that *"they might as well be replaced by a robot"*

(Boulus-Rødje, 2018, p. 27). In Gladsaxe Jobcentre, I also observed an increased scrutiny of untrained social workers, among other things seen in the technology used to support their work.

In this dissertation, I consider social workers (untrained and trained) as competent members and experts in their own practice. While acknowledging their professional background as a resource in their work, I give it less emphasis here, given my primary focus on the 'community of practice' of which they are part. Rather than presuming to de-professionalise the work that, from a political perspective, may seem ripe for digitisation, their professionalism needs to be treated with respect in order for their perspective to be allowed to influence design decisions (Møller et al., 2020). In light of these considerations, I will now discuss the methodology applied in my research.

4.4 METHODOLOGICAL APPROACH

Since the beginning of my PhD journey, my methodological compass has pointed in the direction of *practice*. Having a practice-oriented view of the field, I have been mostly concerned with the lived experiences of the people doing the work. As opposed to beginning from a technology-centric perspective, I wished to gain a deeper understanding of problems and solutions from the perspectives of the social workers in the two municipalities where I conducted fieldwork. As a result, I was able to determine what would constitute appropriate technological support in these circumstances, where it was appropriate, and where it was not. In other words, my first interest was in *practice,* and technology followed as a result.

To gain a better understanding of the practices of social workers across both municipalities, I conducted ethnographic fieldwork. In the CSCW tradition, my fieldwork is similarly termed 'workplace studies' (Møller, 2013). As noted in the introduction to the CSCW field, ethnography is a well-known and widely used approach in CSCW for specifying the role of technologies in the workplace (Harper, 2000). The ethnographic stance entails viewing the social world from the standpoint of participants, and as such, ethnographic studies always occur in the settings in which the activities of interest 'naturally' occur (Blomberg and Karasti, 2013). Silverman (2008) specifies that 'naturally occurring' refers to actions that normally happen in the world of actors, such as meetings between actors or task performance. A situation that is not 'naturally occurring' is one that is created solely by the researcher, such as when the researcher performs an experiment.

Thus, ethnography and 'naturally occurring' data can provide insights into practices otherwise not known to us (Christensen, 2013), and, as similarly noted by Christensen, an important reason for using ethnography in CSCW is that we cannot predict in advance what the relevant features of practice will be, never mind how these features apply to technology development and use (Randall et al., 2007). In light of these arguments, a significant benefit of ethnographic workplace studies in CSCW is that they aim to protect against ignoring important aspects of work in initiatives to support it, due to their concern for the actual circumstances of those who perform the work (Randall et al., 2007) and who are seen as the intended users of a technology (Blomberg and Karasti, 2013).

In terms of 'doing' ethnography, Desmond (2014) notes that *'all matters related to our ethnography flow from a decision that originates at the very beginning of the research process'*. Crucial to this is also a recognition that *what* to look at is just as important as *how* to look at it (Randall, 2018). As ethnographic researchers, we play a big role in what we choose to make 'visible'. We should

not only be drawn by the 'streetlight' but should also be looking for answers in the 'shadows' – perhaps this is where we find the questions we need to be asking. In and of itself, ethnography offers no 'right' or 'wrong' way to go about it. The reason is that ethnography is often *not* viewed as a 'method' (Randall et al., 2007) but as a way of engaging with the world that involves many methods, including observations, interviews and document analysis (Khovanskaya et al., 2017).

In the sections that follow, I will describe the methods used to collect and analyse the empirical studies for this dissertation, after providing a general overview of my empirical motivations and considerations.

4.4.1 EMPIRICAL MOTIVATIONS AND CONSIDERATIONS

As a preface to providing details on the data collection and analysis methods used in this study, this section provides some background information about the experiences and motivations that prompted me to conduct my empirical studies in Syddjurs Municipality and Gladsaxe Jobcenter. As part of my studies at Syddjurs Municipality, my focus has mainly been on the practices of social workers working with vulnerable children, while at Gladsaxe Jobcenter, my focus has been on social workers working with cash benefits cases. Throughout my time at both field sites, I paid special attention to the relationship between formal and informal aspects of social work, with a particular focus on discretionary practice.

Initially, my studies were mainly descriptive records and analyses of practice, but, due to the political dynamics of the research context and my research activities, I had other concerns as well. In this sense, my research was not just descriptive, but also took a critical turn. This happened, for instance, as I studied the ethical aspects of discretion and the value given to discretion by different stakeholders, and as I sought to give voice to social workers and social workers in the design process. In the following paragraphs, I will further elaborate on these considerations. For a more thorough explanation of the studies, please refer to the publications in Part Two of the dissertation

4.4.1.1 First empirical study

The first empirical study took place in Syddjurs Municipality between September 2017 and May 2018. During this period, I visited and re-visited the site for a total of five weeks. I conducted the initial phases of the study in September 2017 as part of my master's thesis, and as one of EcoKnow's preliminary studies on social work practice. The initial study shaped the research I conducted in May 2018, two months into my PhD studies. When I visited the municipality for the first time in 2017, my primary objective was to become familiar with the setting. The data collection began with an introduction to the organisational structure and the law governing social work practice. It included observations and interviews with the administration officer, jurist, and staff from the department of digitalisation. In addition, I read through law texts and local policies. Having become familiar with the setting, I began to reach out to the family department and the social workers, who had been made aware of and welcomed my presence.

I was initially drawn to the field in 2017 with a general interest in how social workers handle cases. This was aligned with the EcoKnow project's desire to ground the design of new case management systems in practice. At this point in time, I was seeking to understand the relationship between formal and informal aspects of work. To build an understanding of this relationship, my research investigated the steps taken in the execution of work, such as the

process of planning, information gathering, decision making and documentation, including social workers' views of good and bad ways of getting things done, routine situations, deviations from normal practice, interdependencies and collaborative aspects of work. By taking this approach, I was able to demonstrate the relationship between rules and the decision-making process, while also acknowledging the influences of the social context and the broader community of practice.

The EcoKnow project and my experiences on the ground continuously shaped the topic of my research. It was my experience that some colleagues from other EcoKnow work packages expressed a special interest in rule-based approaches to technology. For example, it was the goal of EcoKnow's WP2 to explore the potential of digitalising rules in casework and attempts had already been made to model legal processes (prior to the empirical workplace studies). Meanwhile, I became aware of the dangers of overly relying on the law and other rules for determining how to go about a case. Based on my initial studies in 2017, I found that casework is always informed by the individual case and situation. In the context of child protection services, laws are often broad and vaguely defined and require *discretionary* evaluation. My insights were also followed by a wide range of other activities, including the Danish government's introduction of digital-ready legislation in 2018 and 'attack' on discretion, as explained in the background section. As a result of these insights, and previous work on plans and situated action (Suchman, 1987), discretion became the focal point of my studies, and played a central role in my ongoing research and engagement with the field. Having chosen discretion as my object of study, the objective of my first empirical study (and Publication One of this dissertation) was to provide detailed, descriptive insights into the nature of discretion.

My study also had ethical and political elements, as I used the insights from my study to shed light on the myths about the alleged 'subjectivity' and 'randomness' of discretion that were (and still are) informing political digitalisation strategies and public opinion. More details of this study are described in Publication One of this dissertation (Petersen et al., 2020).

4.4.1.2 Second empirical study

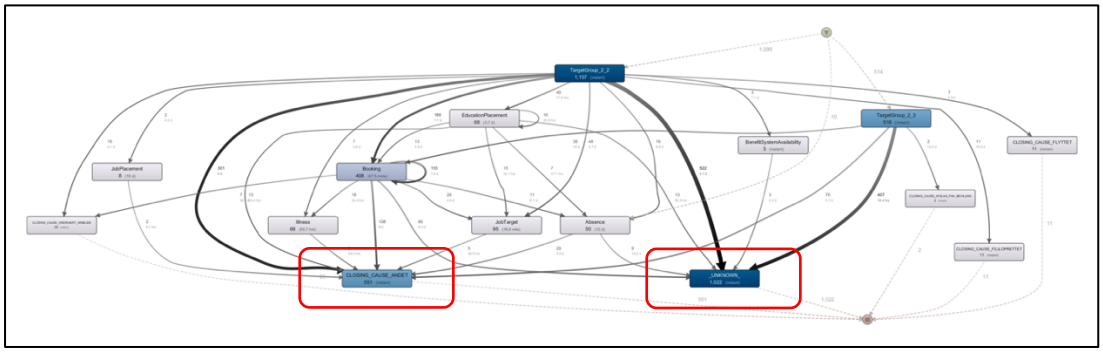
The second empirical study was conducted at Gladsaxe Jobcentre between autumn 2018 and spring 2019. My research interest in discretion and its relationship with formal prescriptions persisted and was equally relevant to this setting. Gladsaxe Jobcentre, however, had its own distinguishing characteristics, as mentioned in the section on the research setting. Thus, similar to Syddjurs Municipality, I approached the field with the same desire to learn about these characteristics.

During the time of this study, some of my colleagues from computer science, and stakeholders in the EcoKnow project, were investigating the possibility of using AI to predict long-term unemployment of citizens as part of real, anonymised cases from the job centre. This was a result of a desire from the municipality's management and followed the broader trends in public sector digitalisation of the time[10]. In this particular case, a 'good' outcome was defined as employment within a year (as per the law on active job creation efforts). According to my colleagues, however, the results of the initial experiment pointed to the lack of vital information about the cases.

10 See, for instance, Denmark's National Strategy on Artificial Intelligence (Ministry of Finance, 2019).

The data did not indicate the *reasoning* behind social workers' decisions to open, amend, and close cases. For instance, the developers told me and shared with me in the flowchart image below[11] that the most common cause of case closure was 'other', which does not indicate much and cannot be used to predict[12]. This became a practical challenge, since, among other things, the developers had to determine whether a citizen's case ended in job placement.

Image 1: Flowchart of common paths taken in welfare benefits cases in Gladsaxe Job Centre.



On the basis of the above observations and experiences, I was curious to learn about the *reasoning* behind the decisions social workers made in the cases, and how they were (and were not) communicated. My empirical study focused on analysing both the information generated by social workers and the data found in the official records, in order to evaluate the suitability of predictive AI in this context – and perhaps more generally. During the early phases of data collection, I discovered a crucial misalignment between the factors going into classifying citizens and the data available in the records. This insight led me to analytically identify the information used by social workers as part of this work and what becomes visible or remains invisible to technological tools (Star and Strauss, 1999). More specifically, I investigated how social workers *use discretion to maintain the invisibility* of sensitive information.

While this study dealt with AI matters, my main concern was with the practical aspects of work (Crabtree et al., 2000). In other words, my task was not to decide what things are, what matters, what is important, trivial, or even right or wrong. Instead, I took an ethnomethodologically inspired and theoretically unmotivated approach to activities by *'looking just to see what people are doing'* (Rouncefield, 2011). The ethnomethodological take on formal and informal descriptions of work was incredibly useful and allowed me to discover the *reasons* offered by social workers, as they decided *not* to write down information – thus making it unavailable for predictive purposes. In doing so, I also followed Harper et al.'s (2016, p. 211) recommendation that *"reasons provide the bedrock of how choices are seen, accounted for and ignored"*.

While this was a descriptive study, it also contributed to wider concerns. I used the study as the basis for my second publication, *"We Would Never Write That Down"*. The fact that I chose to record sensitive information that the social workers themselves did not record involved serious ethical considerations. I finally decided to publish my study in response to the social workers' strong opinions about the issue (of wanting to keep information off the record). If we believe the

11 Note: This chart was created for internal purposes only and is a work-in-progress image from Spring 2019, based on case data from June 2016 to December 2018.

12 For more details on the data, please refer to Publication One in this dissertation.

social workers, certain things should not be made available for predictive purposes – which is important information for anyone involved in determining the current and future role of predictive technologies, and particularly in sensitive contexts. More details on this research and on the reasoning of social workers can be found in Publication Two of this dissertation (Petersen, Christensen, et al., 2021).

In this context, it is also important to point out that before any study was conducted, participants were fully informed about the purpose and use of the research findings and the possible effects of participating. In addition to informed consent, all participants participated voluntarily and were given anonymity, and I experienced a high level of cooperation, openness, and engagement. In Gladsaxe Jobcentre in particular, social workers expressed concern about not having been involved in the creation of their current case management system. To the same end, they eagerly expressed their concerns and wanted to be heard.

4.4.1.3 Third empirical study

In addition to the first empirical study, the third also took place in Syddjurs Municipality, and ran from 2017 to 2020. It was, however, a side project to my overall research endeavours in this field. As mentioned in the first empirical study, some of my colleagues from EcoKnow had previously experimented with rule-based modelling of legal processes. Soon after, it was decided in a meeting between EcoKnow and the municipality to begin technology development based on one of those processes. The chosen process is legally referred to as 'loss of earnings' and is described in §42 of the Danish law on Social Service as the compensation paid to parents who are taking care of their child at home, as a necessary consequence of the child's impairment (Hørby, 2015)[13]. In continuation of this, the municipality decided to conduct a co-design project involving 'loss of earnings' cases in 2018. The municipality went into the project assuming that the case process for 'loss of earnings' includes steps that go beyond the law, and that these can be modelled using insight obtained from interviews and workshops with citizens and social workers who had worked on these cases in the past. The goal was to use these insights to improve future case processes related to 'loss of earnings'.

Image 2: Slide from a presentation given by Syddjurs Municipality at an EcoKnow workshop in Autumn 2018.

13 Please refer to Publication Three of this dissertation for more information on 'loss of earnings'.

Note: the slide reads *"Combining law and practice"* (top middle). *"Graph based on law text"* (middle left). *"Graph based on the actual case process"* (middle right). *"Grant §42 Loss of earnings"* (bottom left).

The municipality formed an internal project team to see through the 'loss of earnings' project and invited me to take part in the process as a *participant observer*. My fieldwork in autumn 2017 and spring 2018 provided important background information, but my participatory role was primarily devoted to interviews and workshops with citizens and social workers in June 2018, meetings between the internal project team, and the initial stages of the design of a new case management system in 2018 and 2019. Early insights from my observations provided me with important insights that spurred me to actively pursue my further inquiry. In particular, I noted that early emphasis on legal outcomes (i.e. compensation for lost wages) had unintentionally devalued the agency of social workers in the later stages of design, despite their invitation to be participatory designers. My findings showed that, to the social workers, the process of 'loss of earnings' does not exist until a case is completed, and until then, an application for 'loss of earnings' can lead to many other outcomes. As a result, despite their efforts to complete the task they were given, it was difficult for the social workers to optimise the process for 'loss of earnings'. During the workshop, they voiced concerns about the legal outcome-based approaches to processes, as in the example below:

> *We try to expand the possibilities, instead of just looking at what parents are applying for [referring to loss of earnings]. I think we put a lot of effort into saying, well, that 'it's not the only way to go. We can take other paths which, in the long run, will be more helpful to you.'* (Social worker, Syddjurs Municipality)

Based on insights obtained from the interviews and workshops, I decided to pay particular attention to the assumptions brought into the design process and how they interact with the lived realities of social work practice. Particularly, I wanted to understand the role of discretionary values by ethnomethodologically analysing the value assigned to *discretion* by different actors as part of their collaborative interactions. As a result, even though this co-design project began as an independent study in 2017, it evolved into a study of the complex relationship between rules and discretionary practice. Hence, my third empirical study advanced my previous research in that it provided empirical insights into the discretionary values of social workers as they participate in design and in the process of 'making a plan'.

Based on the above considerations, my third empirical study included an important ethical element. By conducting descriptive analyses of discretionary values, I was able to make them available as design criteria and give the social workers a voice in the design process. This was a challenging task that required ongoing negotiations with all of the parties involved. However, it was made easier by my role as a participant observer, since in this case I was actively participating in the events I observed. Further, I considered this to be my primary responsibility as a researcher who is particularly interested in the perspective of social workers. More details about this and its considerations are described in Publication Three of this dissertation (Petersen, manuscript).

4.4.1.4 From ethnographic inquiry to reflective experience

> *Regardless of our intentions, research effectively intervenes by accepting, challenging or diversifying problem definitions of the actors we study. We need to ask ourselves what this means in our particular case.* (Mesman, 2007, p. 281)

The three empirical studies described in this section provide details on different aspects of discretionary practice and their implications for technological intervention. Nevertheless, as this section has also pointed out, these studies did not take place in a vacuum. All of them have been prompted by my field experiences, but they have also been subject to various other influences. In the process of doing research, I have reflectively considered the various aspects that influenced and motivated me and their impact on my work.

In my attempts to protect the interests of the social workers, I sometimes had to separate myself from the tasks of the EcoKnow project and the other working groups. However, I also wanted my research to make a meaningful contribution to the wider project and the development of technologies within the research settings. As such, the ethical issues that have been central to my research from the very beginning have also developed in a relational, collaborative way in which multiple stakeholders have been involved.

Many practical challenges have arisen from my research activities, such as differences in power dynamics between stakeholders, including managers, social workers, and developers. During my empirical studies, I sometimes found myself in difficult situations, as varying groups perceived my work in different ways. For instance, as the following narrative illustrates, it is likely that managers and social workers have different views about what constitutes good practices in helping citizens, which can further complicate the process of navigating research in these environments.

> *In the initial phases of my fieldwork in Gladsaxe Jobcenter, I presented my findings from my ethnographic studies of casework practice. At first, my colleagues and I saw this as an excellent opportunity to make key decision-makers aware of the field. In my report, I provided detailed descriptions of casework practice, including the discretion that social workers use to interpret rules and work around systems for specific purposes. However, the job centre management did not respond well to the report. The report suggested that some social workers were not using the system as intended and one manager asked: "Does this mean all of our [social workers] have to attend a training course [in how to use the casework system]?" I am also asked to reveal the names of the social workers involved in my study.*

This and other challenging field experiences, prompted the fourth and final publication of my dissertation. The fourth publication combines the reflections of four EcoKnow researchers, as we came together to discuss our personal challenges of doing research in an interdisciplinary field, with multiple and often conflicting interests. Methodologically, this was a challenging exercise, but a useful way of tackling complex issues and re-framing them in light of our new understanding. From this perspective, what was initially seen as conflicts became useful resources for design, and generated opportunities for enhanced collaboration across disciplines and stakeholder interests (Mesman, 2007).

Based on my overall experiences and considerations from my empirical studies, the following section presents the data collected throughout this dissertation.

4.4.2 DATA COLLECTION

The ethnographic fieldwork for this dissertation took place between September 2017 and December 2019. This chapter has already mentioned that data collection began with an exploratory approach to better understand how casework is done in the two municipalities, before considering whether and how technology can be used to facilitate this work. The preliminary insights gained from my ethnographic field studies, and the broader context in which my research took place, inspired the focus of my research on discretion and my desire to understand its relationship with public digitalisation.

My empirical material includes observations, interviews, and the acquisition of documents from multiple sources. As I was gathering data, I considered all my activities as potentially being data. However, I paid particular attention to the lived experiences of *the people doing the work*. Thus, as much as the complete data contribute to my continuous research focus and inquiry, the majority of the empirical material is derived from observations and interviews with social workers in Syddjurs Municipality and Gladsaxe Jobcentre. The following describes the data obtained and analysed for this dissertation.

4.4.2.1 Observations

My fieldwork involved daily observations. Typically, my fieldwork in Syddjurs Municipality and Gladsaxe Jobcentre was divided into two stages. On the first day, I would follow a social worker and observe their daily work practices. To understand how and why they do certain things, I would follow them on that day throughout all of their activities. These activities ranged from computer-based tasks to information exchanges with colleagues and meetings with citizens. I would also follow them as they sought assistance from others, walk with them, and go to lunch with them. These activities made it clear that what appeared to be a straightforward task could actually involve numerous factors. For example, it may appear that informal conversations between social workers during their lunch break are unrelated to work, but in fact they may be where complicated cases are discussed and resolved.

During the second day, I would observe the same person I observed on the first day and conduct semi-structured interviews as a follow-up to the activities. I also used observations during interviews and meetings to keep track of the relationship between events (what participants did) and accounts of events (what participants said happened) (Jordan, 1996, p. 33). Furthermore, I was invited to participate in a number of meetings and events, including internal team meetings, training courses, and participatory design workshops with social workers and citizens.

My fieldwork at Gladsaxe Jobcentre typically began every the morning with a bus ride there and ended in the afternoon with a bus ride back home. The close distance from Copenhagen made this possible for me at the time. Meanwhile, Syddjurs Municipality is located in a small village in East Jutland and involved a four-hour train and bus ride. During my fieldwork there, I lived in a small hotel within walking distance of the municipality. Thus, by staying in the area where I conducted my fieldwork, I gained a more local perspective on my research.

Image 3: The hotel I lived in during my fieldwork in Syddjurs Municipality.

During fieldwork, my observations were documented through fieldnotes, which served as a record of the thoughts, actions, and feelings that emerged while I was in the field. For this purpose, I used a double-entry notebook, which means that I followed up each observation with my own interpretation. If I was unable to take notes during observation, I would write down my immediate thoughts and impressions afterwards. For instance, when attending a meeting between a social worker and a citizen, I was especially sensitive to the situation and did not bring my notebook. Often, these meetings were complex. For example, in one meeting, social workers had to explain to a father that he could not see his child outside hours determined by the municipality.

When deemed appropriate, I would also record my observations by taking photographs of what I observed. Photographs were used as memory triggers and to capture the social spaces within which by observations took place. In one case, during the workshops with citizens and social workers in Syddjurs Municipality, we would also use video as an opportunity to observe and re-observe the complex interactions in these situations.

Image 4: Example of photographs taken during field observations in Syddjurs Municipality.

In addition to recording my observations every day as they happened, I would describe them in detail once I had left the municipality. The information I recorded also included awareness of my own role in observations, as well as how my presence affected the situation observed. This was particularly useful while I was acting as a participant observer, such as during the design project addressed earlier in this chapter and in Publication Three of this dissertation (Petersen, manuscript). Last but not least, I would seek common ground through continuous conversations with participants and stakeholders involved in the EcoKnow project. As part of my ongoing research, I used all of these exercises to develop follow-up questions and new research questions.

The table below presents an overview of my documented observations throughout the study period. Since most observations were not time-stamped in the same way as recorded interviews, the length of the observation is used as an indicator.

Table 1: Overview of observations

Observational focus	Participants	Location	Time	Length
Organisational setting	Administration, digital consultants, developers and family department, including social workers	Syddjurs and Gladsaxe	Sep 2017	10 hours
Work practices	Social workers	Syddjurs and Gladsaxe	Sep 2017 – Dec 2019	60 hours
Participatory design workshops	Internal project team, developers, citizens, social workers, EcoKnow researchers	Syddjurs, Gladsaxe and nearby locations	May and Oct 2018	22 hours
Municipal meetings (e.g. team meetings)	Social workers, municipal leaders, third party professionals	Syddjurs and Gladsaxe	Sep 2017 – Jun 2019	10 hours
Meetings between social workers and citizens	Social workers, citizens and third party professionals	Syddjurs and Gladsaxe	Sep 17 – Nov 18	20 hours
Events (e.g. training sessions)	Social workers, municipal leaders, third party professionals	Syddjurs, Gladsaxe and nearby locations	Sep 2017 – Dec 2019	8 hours
On-going project planning	EcoKnow researchers, municipal leaders, developers	Syddjurs and Gladsaxe	Sep 2017 – May 2018	10 hours
				140 hours

4.4.2.2 Interviews

In addition to observational studies, interviews were another important way to gather information from participants in the municipalities. Interviews served as an in-depth method to enable me to better interpret other data sources and to probe deeper into the discretionary practices of social workers. Typically, I used interview guides to balance the thematic structure and leave open spaces for questions to develop as my understanding as a researcher and my engagement in the activities evolved. Several employees from both municipalities agreed to participate in interviews, resulting in a total of 40 interviews with 28 respondents. While my main interest was in the social workers in the municipalities, it was important for me to include various perspectives on discretion and public digitalisation by interviewing employees from different departments.

As mentioned above, I usually began my fieldwork with observational studies of social work practice, followed by in-depth interviews. It was common for interviews to take place in-situ in order to connect observations of work practice with a descriptive and reflective exercise on these

same practices. In these cases, I would structure the interview so that the majority of questions asked participants to illustrate how something was done in practice. At other times, the interview would take place in a meeting room or a quiet, private space due to the nature of the issue under discussion. In any case, I would leave the choice up to the participant. Typically, when I was interviewing employees from different departments, I would not observe their work practices first, as I wanted to include their perspectives on discretion and public digitalisation, but their actual work practices were outside my methodological scope.

All interviews were conducted in person, and most lasted for about one hour. The interviews were all audio recorded, and several interviews were transcribed for analysis. Furthermore, I engaged in informal conversations with other members of the municipality, the job centre, and citizens. Many of these conversations took place while I was conducting my observational studies. The following table provides details of each interview.

Table 2: Overview of interviews

Number	Interviewee	Department	Setting	Time	Length
1	Administrative officer (1)	Administration	Syddjurs	Sep 2017	49 min.
2	Jurist	Administration	Syddjurs	Sep 2017	50 min.
3	Team coordinator	Digitalisation	Syddjurs	Sep 2017	1 hour 26 min.
4	Consultant	Digitisation	Syddjurs	Sep 2017	39 min.
5	Social worker (1)	Family department	Syddjurs	Sep 2017	1 hour 21 min.
6	Social worker (2)	Family department	Syddjurs	Sep 2017	46 min.
7	Social worker (3)	Family department	Syddjurs	Sep 2017	45 min.
8	Consultant	Digitisation	Syddjurs	Sep 2017	38 min.
9	Administrative officer (1)	Administration	Syddjurs	Sep 2017	10 min.
10	Social worker (1)	Family department	Syddjurs	Sep 2017	11 min.
11	Head of department	Digitisation	Syddjurs	Sep 2017	1 hour 05 min.
12	Social worker (5)	Family department	Syddjurs	Sep 2017	11 min.
13	Social worker (3)	Family department	Syddjurs	Sep 2017	1 hour 9 min.
14	Social worker (4)	Family department	Syddjurs	Sep 2017	23 min.
15	Developer (1)	Administration	Syddjurs	Sep 2017	1 hour 07 min.
16	Social worker (2)	Family department	Syddjurs	Sep 2017	57 min.
17	Social worker (6)	Family department	Syddjurs	May 2018	47 min.
18	Social worker (7)	Family department	Syddjurs	May 2018	56 min.
19	Social worker (8)	Family department	Syddjurs	May 2018	52 min.
20	Social worker (2)	Family department	Syddjurs	May 2018	46 min.
21	Social worker (1)	Family department	Syddjurs	May 2018	24 min.
22	Social worker (1)	Match group 2.2	Gladsaxe	Sep 2018	1 hour 20 min.
23	Social worker (2)	Match group 2.3	Gladsaxe	Sep 2018	1 hour 09 min.

24	Social worker (3)	Match group 2.3	Gladsaxe	Oct 2018	50 min.
25	Social worker (4)	Match group 2.3	Gladsaxe	Oct 2018	1 hour 21 min.
26	Social worker (5)	Match group 2.2	Gladsaxe	Nov 2018	1 hour 09 min.
27	Social worker (6)	Visitation (2.2+2.3)	Gladsaxe	Nov 2018	34 min.
28	Developer (1)	Administration	Syddjurs	Jun 2019	1 hour 05 min.
29	Social worker (9)	Family department	Syddjurs	Jun 2019	51 min.
30	Social worker (10+11)	Family department	Syddjurs	Jun 2019	1 hour 16 min.
31	Social worker (12)	Family department	Syddjurs	Jun 2019	45 min.
32	Social worker (13)	Family department	Syddjurs	Jun 2019	49 min.
33	Social worker (14)	Family department	Syddjurs	Jun 2019	47 min.
34	Social worker (7)	Family department	Syddjurs	Jun 2019	1 hour
35	Social worker (15)	Family department	Syddjurs	Jun 2019	52 min.
36	Social worker (16)	Family department	Syddjurs	Dec 2019	1 hour 43 min.
37	Developer (1)	Family department	Syddjurs	Dec 2019	1 hour
38	Social worker (7)	Family department	Syddjurs	Dec 2019	30 min.
39	Social worker (3)	Family department	Syddjurs	Dec 2019	41 min.
40	Social worker (1)	Family department	Syddjurs	Dec 2019	51 min.
40 interviews	**28 interviewees**	**5 departments**	**2 settings**	**3 years**	**34 hours 45 min.**

4.4.2.3 Document gathering

During and after my fieldwork, I gathered documents that acted as a valuable source of background knowledge, contextualised my observations and interviews, and provided additional information about my empirical studies. In particular, I found the documents useful for understanding local work practices and the framework within which social workers operate. Moreover, the documents provided context for understanding the purposes and exposed values of digitalisation across both municipalities.

Documents were obtained from various sources, including the internet, the municipalities and the social workers I studied. In total, I collected around 100 public and internal documents, such as law texts, internal reports, policy documents, national digitalisation strategies, local process descriptions, news articles, press releases, and e-mail correspondence. I also shared documents with my colleagues from the EcoKnow project to contextualise our experiences and to further develop our analysis as part of Publication Four of this dissertation (Petersen, Cohn, et al., 2021).

In the table below, I provide examples of the types of documents used across all settings.

Table 3: Overview of documents

Document type	Examples	Publisher
Legislations	The Danish Law on Social Services and Active Job Creating Efforts, The General Data Protection Regulation (GDPR).	The Danish government
Internal documents	Policy documents, process maps, PowerPoints, strategy maps, organisational structure.	Syddjurs and Gladsaxe
National strategies and reports	National strategy for Digitalisation, Digital-ready legislation, National Strategy for Artificial Intelligence	The Danish Government
News articles and press releases	Press coverage of EcoKnow and municipalities, public digitalisation trends, public opinion on public digitalisation.	Media outlets
Emails	Conversations between project stakeholders, meeting invitations and minutes.	Syddjurs, Gladsaxe and EcoKnow

4.4.3 DATA ANALYSIS

The analysis of data was based on an iterative process of gathering together, listening, categorising, comparing and contrasting common themes and major issues found in the data. My analysis began while I was still collecting data, as my ongoing interpretation and understanding was used to inform the direction of my fieldwork (Hughes et al., 1993). I used NVivo and open-ended coding to analyse my data, which comprised observational fieldnotes, interview transcripts, and acquired documents. The processes of analysing data in NVivo involved the creation of labels and tags which, based on how frequently the issues were mentioned or observed and the level of importance they were given, led to the discovery and development of categories.

As previously mentioned in my empirical considerations and motivations, my studies were mainly focused around descriptive records of casework practice. I found descriptive records to be especially valuable due to the limited understanding of the nature of discretion in the area of public digitalisation. Thus, in the process of both collecting and analysing data, I was inspired by the ethnomethodological approach to ethnography (Rouncefield, 2011; Randall et al., 2020). Rather than giving accounts and explanations of members' values, beliefs and judgements, my interest was to analytically examine how these are organised and produced in members' own accounts, and how they are embedded in practice (Hall et al., 2014).

As noted by Dourish (n.d., p. 2), *"It is impossible to present empirical results without a set of analytic commitments, just as it is impossible to present a design contribution without solving technical problems"*. In this dissertation, I have made it clear that my primary focus is the social workers' point of view. Generally speaking, ethnography concerns itself with the point of view of actors, albeit 'point of view' can mean many different things (Randall and Rouncefield, 2020). In my case, 'point of view' also involved reflections on moral and political issues due to the nature of my research and my role as a researcher. For example, as previously noted in my section on conceptual reflections, definitions of discretion often have their roots in the legal notion of 'justice' where any deviance from formal rules is considered 'unjust'. The development of technology for social services, in particular, has often focused on standardisation to enhance

justice. But here is the issue: To social workers and citizens alike, justice does not always mean getting the same treatment as others.

As Randall and Rouncefield (2020) note, ethnomethodology is merely a descriptive discipline and does not address political issues. Thus, to address the political aspects of my work, Publication Four of this dissertation (Petersen, Cohn, et al. 2021) used 'problematisation' as a method to problematise different and commonly held views on concepts such as discretion. As part of this publication, four members of the EcoKnow team came together to discuss underlying assumptions and the effects they have on our research. By gaining a better understanding, we could open up the possibility of imagining alternative viewpoints. In this and other cases, I used my data as an occasion for sensemaking of multiple stakeholder perspectives (Neff et al., 2017) and circulated my findings at various stages of analysis.

Several of these experiences led to interesting discussions with political implications. For example, on one occasion, when translating parts of my second publication from English to Danish, I was asked by a colleague from computer science if my mentions of *"welfare seekers"* were the correct translation of *"arbejdsløse"* (in English: *"unemployed"*). The question prompted me to reflect on my choices as a researcher and their impact on the people I study. In our conversation, I explained that my study focuses on people who are in a difficult situation, as they seek welfare benefits but are unable to take a 'normal' job. In many ways, they do not 'fit' into the normative rationale that is reflected in the Danish law on active job creation efforts, where everyone is characterised as 'employable' in one sense or another (Petersen, Christensen, et al., 2021). Thus, I consciously wanted to emphasise certain people's need for welfare benefits, rather than their unemployment status.

Using examples such as the above, my data analysis has focused on members' own accounts of the activities I studied. Nevertheless, as I gathered, categorised and compared and contrasted themes and issues identified in the data, I was also conscious of my role in representing the world in certain ways and allowed for different viewpoints to be discussed along the way.

Following a description and reflection of the research undertaken, the methods used to collect and analyse data, and my role as a researcher, the following chapter discusses the results of the publications included in the dissertation.

CHAPTER 5: RESEARCH FINDINGS AND CONTRIBUTIONS

In this chapter, I will situate the findings of each publication within the overall contributions of my dissertation. This chapter therefore also expands on the conceptual contributions discussed earlier in the Conceptual Reflections chapter. The four publications in this dissertation present different aspects of discretion while relating them to their role in public digitalisation. The publications are arranged in order of the empirical fieldwork conducted and the data analysed for the purposes of the dissertation. As a result, my publications reflect my empirical focus as it has evolved as part of my research activities over the years. Table 4, below, contains an overview of the publications, their research aims, analytical focus and current publication status.

In the following sections, I discuss the findings of each publication, including their contributions to research and practice. Lastly, Chapter 6 concludes the first part of the dissertation with a reflection on the coherent themes in my contributions and their implications for future research.

Table 4: Overview of publications

Publication	Research aim	Analytical focus	Status
1. The Role of Discretion in the Age of Automation	What characterises the nature of discretion as part of decisions made in casework? Reflect on findings in light of digitalised and automated decisions.	The ways in which discretion is seen, used and accounted for by social workers, in view of the decisions made as part of child protection cases (in particular, children placed in care).	Published in the Journal of Computer-Supported Cooperative Work (CSCW), Vol. 29, 2020.
2. *"We Would Never Write That Down"*: Classifications of Unemployed and Data Challenges for AI	What is the reasoning behind social workers' decisions not to record all data on unemployed citizens that they, themselves, use in their classification work? Discuss implications for AI as a decision-support tool in this context.	The pragmatics of classification work in a job centre. The reasons provided by social workers as they account for their decisions concerning unemployed welfare seekers' ability to work and right to receive benefits.	Published in the Proceedings of the ACM on Human-Computer Interaction, Vol. 5, CSCW1, 2021.
3. Modelling a Process that *"Doesn't Really Exist"*: Co-Designing AI with Street-Level Bureaucrats	What can we do to design a process with social workers if they do not believe that the process exists? Consider ways of re-thinking processes from the bottom up, by involving social workers and discretionary values in design.	Social workers' articulation of discretionary values as part of a participatory design process that (initially) seeks to 'optimise' a legally defined process.	Submitted for review to ECSCW 2022: Proceedings of the 20th European Conference on Computer-Supported Cooperative Work.
4. 'Thinking Problematically' as a Resource for AI Design in Politicised Contexts	In what circumstances is AI seen as a solution and to which problem, by whom, and on what grounds? Work towards a more open-ended approach to AI design by problematising political ideals in this space.	Unpack different views of AI-based technologies in the context of public digitalisation, and the process by which they are negotiated into being. Emphasis is placed on personal experiences from the EcoKnow project.	Published in the Proceedings of CHItaly 2021: 14th Biannual Conference of the Italian SIGCHI Chapter.

5.1 THE ROLE OF DISCRETION IN THE AGE OF AUTOMATION

The first publication is a peer-reviewed journal paper, published in the Journal of Computer-Supported Cooperative Work14 in January 2020 and co-authored by Associate Professor Lars Rune Christensen and Professor Thomas Hildebrandt (Petersen et al., 2020).

The paper examines discretionary practice in social work and its relationship to formal constructs such as laws and internal policies, which often serve as a foundation for digitalised processes in the public sector. The empirical material was collected through in-depth interviews, observations, and collection of documents during four weeks of ethnographic fieldwork in Syddjurs Municipality, in 2017 and 2018. The paper begins by examining public discourse on the digitalisation and automation of public services, as well as the prevailing views on discretion expressed during this process. It looks at how motivations and plans for achieving public digitalisation are tied to myths about discretion. Based on this examination, the paper addresses the need for a better understanding of discretion and the work practices that underpin it.

The paper draws on two research traditions in the study of discretionary practice. The first is initiated by Lipsky (1980) and his concept of 'street-level bureaucracy', which has since been developed further within this tradition. However, the tradition from Lipsky onwards mainly considers discretion as an individual exercise of judgement. The paper finds that, despite the attention given to discretion, there is a lack of research empirically investigating its practice as it 'naturally' occurs. The paper combines research on discretion with CSCW studies on 'formal constructs' (Suchman, 1987, 2007; Schmidt, 1997) to address the need for a practice-oriented view of discretion, and to gain a better and more nuanced understanding of its role as part of the public digitalisation agenda.

The findings of the paper are structured based on common decisions made by social workers as part of child protection cases and show how formal constructs are interpreted and integrated by social workers' discretionary enactment of law and rules. Accordingly, it illustrates the level of autonomy inherent in compliance and how it differs from earlier work on routines and exceptions (Suchman, 1987, 2007; Schmidt, 1997). In this case, it is not a question of determining the role of 'formal constructs' beforehand, as the social workers use them flexibly depending on the situation. Moreover, the results demonstrate that social workers' discretion is not solely determined by the case, but is also influenced by the context and by the many other stakeholders. Consequently, discretion allows social workers to act according to the situation and take individual needs into account, while at the same time being influenced by the community of practice of which discretion is part. Based on these findings, the paper expands on the concept of discretion and introduces it as a collaborative achievement, rather than an individual task.

By recognising discretion's complexity and cooperative nature, the paper contributes to a deeper and more nuanced understanding of discretion in public digitalisation. This paper thus makes an important contribution to the CSCW community. Additionally, the paper lays the foundation for future work on discretion and its role in public digitalisation. Specifically, it highlights two issues that are particularly relevant to any account of discretion in sensitive and complex contexts, such as social work and child welfare programs. The first issue is whether or not discretion can be eliminated from cases. It is suggested in the paper that removing discretion

14 https://www.springer.com/journal/10606

through digitalisation would be impossible because of the complex relationship between rules and practice and the many influences that shape practice outside of the formal prescriptions of work. Consequently, the paper contributes to opening up the debate about what can be automated in this and similar decision-making contexts, and dispels the myth that automation is the only solution. A second question is whether it is desirable to remove discretion. The paper illustrates the need for social workers to be capable of interpreting and modifying rules in order to treat people's differences, and the risks involved if they cannot do so. Thus, the paper raises new questions about what should be automated in the context of public digitalisation. As a practical matter, the issues of possibility and desirability are closely related, since disputes about whether it is desirable to remove discretion in favour of automation often arise in situations where eliminating discretion is difficult.

As a final point, the paper contributes directly to the EcoKnow project by presenting discretion to a number of stakeholders and incorporating it as an important factor in the design, implementation, and evaluation of technologies for the local settings we examined.

5.2 *"WE WOULD NEVER WRITE THAT DOWN"*: CLASSIFICATIONS OF UNEMPLOYED AND DATA CHALLENGES FOR AI

The second publication is a peer-reviewed conference proceeding, published in the Proceedings of the ACM on Human-Computer Interaction in April 2021 and invited for presentation at the 24th ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2021)[15], October 23-27, held virtually. The paper is co-authored by Associate Professor Lars Rune Christensen, Professor Richard Harper and Professor Thomas Hildebrandt (Petersen, Christensen, et al., 2021).

This paper is based on research conducted in Gladsaxe Jobcentre over the course of four weeks from 2018 to 2019. The purpose of this paper is to explore the informal classifications used by social workers to 'fit' welfare seekers into the formal categories applied at the job centre. This is done as part of a study that examines how discretionary judgements can be used to train AI systems to predict long-term employment for unemployed citizens.

The literature review integrates foundational literature on social classifications with more recent papers on classification work and invisible work from within CSCW. Research in CSCW has long pointed out the limits of technologies in making certain information visible (e.g. Suchman, 1995; Bowker and Star, 1999; Star and Strauss, 1999; Star and Bowker, 2007; Møller and Bjørn, 2011; Boulus-Rødje, 2018). Nevertheless, since AI can handle complexity and combine criteria in ways that were inconceivable only a few years ago, the paper argues that we need new perspectives on how to address the current issues of data and 'visibility' in light of today's technologies. Thus, the purpose of this paper is to draw upon previous work to address the current challenges of implementing AI in the public sector and within sensitive decision-making contexts.

The paper empirically shows that social workers face challenges in classifying very diverse people into rigid categories and that the logic of the categories often conflicts with the reality they observe. To overcome these barriers, the social workers make more fine-grained

15 https://cscw.acm.org/2021/

classifications of clients to guide their interactions, but these are not recorded, and so are not available to an AI system. The paper shows that social workers have strong moral reasons for not formalising and recording this information, such as the concern of permanently labelling someone in one way or another. On that basis, the paper shows how social workers exercise discretion to collaboratively negotiate and contest the meanings of formal categories, and to preserve the invisibility of their classification work.

A long time ago, Bowker and Star (Bowker and Star, 1999) called attention to the moral decisions involved when creating and maintaining classification systems, many of which end up in computer systems. Until now, these issues have mainly been addressed from the perspective of policymakers (e.g. Keymolen and Broeders, 2011; Flyverbom, 2019,) or system developers (e.g. Bovens and Zouridis, 2002; Alkhatib and Bernstein, 2019,). By offering empirical insights on the discretionary practices that shape the available datasets for AI, this paper contributes to the advancement of the concept of discretion to include aspects of a design process. Similarly, the paper contributes to CSCW research in sensitive contexts, by showing that the problem of implementing AI might not only be to do with the technology itself, as previous research suggests, but also with human questions about what data is (and should be) made available for AI. As noted by Møller et al. (2020), these practices are becoming increasingly important to understand, so that system designers and data scientists can structure data in a way that is sensitive to practice.

More generally, the paper contributes to the general debate on how AI is used in these and similar contexts. As mentioned in the background chapter of this dissertation, risk prediction is currently at the heart of the design of automation and AI-based systems in the Danish public sector. Nevertheless, if we believe the social workers in our study, some things should not be made available for predictive purposes. In contrast to the Danish government's embracing agenda, this raises some important questions regarding whose interests are served by predictive AI systems. In addition, it provokes the question of whether technological solutions to people's problems can be found, or whether what is necessary is a change in laws and other policies which drive digital transformation within the public sector. These are all essential pieces of information for anyone involved in figuring out the current and future role of predictive technologies, and especially in sensitive circumstances. There is more to this contribution than the now-standard AI critique that humans are fuzzy and do not fit into the formal, stable categories assumed by bureaucracies and AI alike. Instead, this paper suggests that if we do not think of the goal as predicting the future and replacing social worker judgements, we can open up a space for *alternative possibilities* and uses of AI.

The CSCW focus on practice-oriented research means that the findings derived from my research are highly relevant in practical settings. The findings of this paper are of special interest to any practitioner of AI who would follow the standard approaches in the field, in this context or elsewhere. Thus, I have also hoped to contribute to knowledge outside of academic fields, so as to reach a wider audience. As noted by Lang (2003):

> *"…the traditional mechanisms whereby academic researchers disseminate their work are prone to numerous communication breakdowns, and … much work which could potentially make valuable contributions to practice is haplessly lost within the vaults of academia."* (Lang, 2003, p. 21).

Due to these considerations, I have also felt a responsibility to disseminate my findings through other channels to maximise their impact. This is something I was able to accomplish with this paper, and I consider this to be an important contribution to my dissertation.

Among other things, I was interviewed in Politiken, a major Danish newspaper, which led to the following article in Danish[16]:

Image 5: Interview with Politiken, May 2021.

Kunstig intelligens er ubrugeligt på socialkontoret

Sagsbehandlere holder bevidst følsomme oplysninger ude af de offentlige systemer. Derfor kan kunstig intelligens ikke forudsige, hvem der bliver langtidsledig, viser ny dansk forskning.

KUNSTIG INTELLIGENS

JENS BOSTRUP

Folketinget har lagt op til, at der skal bruges kunstig intelligens til at udpege de personer, som har størst risiko for at ende i langtidsledighed og derfor brug for ekstra hjælp. Men den kunstige intelligens hænger overhovedet ikke sammen med det arbejde, der i praksis finder sted på socialkontorerne.

Det konkluderer et forskningsprojekt, der er gennemført i Gladsaxe Kommune, og som er offentliggjort i PACM HCI, et førende internationalt samarbejde om digitalisering.

»En stor del af arbejdet med ledige består af vurderinger, som aldrig bliver skrevet ned, og som derfor ikke indgår i grundlaget for maskinens beregninger«, siger artiklens forfatter, Anette Chelina Møller Petersen.

Det er for eksempel væsentligt, om den ledige lugter af alkohol eller bliver ked af det, når der bliver spurgt til helbredet.

»Det mest interessante er årsagen til, at den slags ikke bliver skrevet ned: Sagsbehandlerne frygter, at oplysningerne kan blive taget ud af kontekst og bruges i andre sammenhænge«, siger hun.

Sagsbehandlerne er desuden nervøse for, om oplysninger om misbrug eller fysiske eller psykiske udfordringer vil putte klienterne i en kasse, de får svært ved at komme ud af. Anette Chelina Møller Petersen har fulgt sagsbehandlernes arbejde med at vurdere de lediges risiko for langtidsledighed, deltaget i interne møder og møder med klienterne og efterfølgende lavet opfølgende interviews.

Maskinen kan ikke se risikoen

Udgangspunktet for hendes feltarbejde var kollegaers forskning, som havde svært ved at se nogen sammenhæng mellem langtidsledighed og historiske data. Det satte Anette Chelina Møller Petersen sig for at finde årsagen til.

"Det ville vi aldrig skrive ned' lyder titlen på forskningsprojektet med et citat fra en af sagsbehandlerne som forklaring på, at de relevante data og kriterier ikke kan ses i systemerne.

Sagsbehandlerne beskytter klienterne med flittig brug af kategorien 'andet', når systemet spørger til, hvilke udfordringer klienten har. »Det er faktisk den kategori, sagsbehandlerne oftest anvender«, siger hun.

> **Man kan ikke løse et politisk problem med kunstig intelligens**
> Anette C.M. Petersen, ph.d.-studerende

Forskningsprojektet beskriver to væsensforskellige opfattelser af sagsbehandlernes arbejde, de formelle regler og systemer, der meget firkantet sætter ledige i en af to bøtter: de jobparate, der kan tage et job inden for tre måneder, og de aktivitetsparate, der skal hjælpes over i den første kasse, så de senere kan få et job.

I praksis er det nærmest umuligt for sagsbehandlerne at sætte klienterne i den kasse, hvor de har brug for hjælp, fordi betingelserne i lov om aktiv beskæftigelse er så skrappe.

I strid med reglerne

Derfor har sagsbehandlerne lavet deres egne og mere rummelige kasser, der bedre beskriver de faktiske forhold. Når en klient beskrives som 'tung', ved kollegaerne godt, at hun i virkeligheden slet ikke er jobparat, men har behov for hjælp og behandles derefter.

En sagsbehandler fortæller, at hun i strid med reglerne lempede på kravet om to jobansøgninger om ugen, fordi hun vurderede at klienten 'lene' ellers ville bryde sammen. Bare det at komme ud af sengen var ifølge sagsbehandlerens vurdering en næsten uoverstigelig opgave.

»Mange af sagsbehandlerne siger, at de forsøger at gøre deres bedste for deres klienter på trods af lovgivningen og presset fra politikere og ledelse«, siger Anette Chelina Møller Petersen.

Men er det ikke meget fint, hvis kunstig intelligens kan tvinge sagsbehandlerne til at følge loven?

»Det er netop målet med automatisering af beslutningerne. Men vores forskning viser, at det ikke kommer til at fungere. Man kan ikke løse et politisk problem med kunstig intelligens. Den indsigt kunne bruges til at genoverveje automatiseringen og måske også selve lovgivningen«, siger Anette Chelina Møller Petersen.

Er sagsbehandlerne politisk uenige i den gældende lovgivning, eller forsvarer de deres faglighed?

»Flere taler om at 'modarbejde' et system, der ikke fungerer. Men jeg har udelukkende hørt socialfaglige argumenter, såsom behovet for at tilføje nuancer og se på menneskers konkrete situation«.

Gladsaxe Kommune er enig. »Konklusionen var, at det ikke ville give mening at bruge AI på området. Vi har aldrig selv brugt AI på området og har heller ikke planer om det«, skriver kommunikationschef Ulla Baden i en mail.

jens.bostrup@pol.dk

På jobcentrene skal de forsøge at skelne mellem stærke og svage ledige. Den proces kan ikke automatiseres, for der er for mange menneskelige faktorer i spil. Arkivfoto: Marius Nyheim

In addition to my research being covered by the media, my findings also had a real-life impact, as HK17, a Danish Trade Union, contacted me with the following message and invited me to present my findings to their senior management. The following is an excerpt from the email I received from HK's Head of IT Development:

> *We have a great interest in how technological development affects our members' job content and thus HK's core services. Here, your research is an important contribution to the foresight we would like to have, both in terms of the specific task solution in the job centre and also in terms of which problems/opportunities your general findings point to.* (Translated email excerpt from HK, May 2021).

16 For the sake of clarity, the above headline reads: "*Artificial Intelligence is useless in the social security office*". My research, however, does not indicate that AI is in any sense useless. AI is many things, and despite warning against predicting long-term unemployment, the paper points out other possible applications of AI. In addition, the paper does not make any claims about social security offices in general, but rather about job centers specifically. The article was also published online on Politiken.dk, with a slightly different headline: https://politiken.dk/viden/Tech/art8192731/Derfor-virker-kunstig-intelligens-ikke-Sagsbehandlere-holder-følsomme-oplysninger-for-sig-selv

17 https://www.hk.dk/omhk/about-hk

Last but not least, the lessons from this paper have also made a direct contribution to EcoKnow, the technologies developed within this project, and Gladsaxe Jobcentre. The Principal Investigator of the EcoKnow project wrote: *"The ethnographic work has been extremely useful. It has challenged the idea that data from the case management systems reflect practice and thus also how it can be used to improve the perceived quality of the casework"*. Furthermore, in direct response to my interview with Politiken (included in the article above), the Head of Communications at Gladsaxe Jobcentre stated: *"We concluded that it would not be appropriate to use AI in this case. We have never used AI in this area and have no plans to do so"* .

5.3 MODELLING A PROCESS THAT *"DOESN'T REALLY EXIST"*: CO-DESIGNING AI WITH STREET-LEVEL BUREAUCRATS

The third publication is a single-authored manuscript submitted for review to ECSCW 2022 and the Proceedings of the 20th European Conference on Computer-Supported Cooperative Work.

This paper is based on three years of ethnographic fieldwork (2017-2019) in Syddjurs Municipality. This paper, as mentioned previously in the research design chapter, focuses on a co-design project conducted by the municipality in 2018. As seen from the perspective of the municipality, the project combined legal processes with the experiences of citizens and social workers involved in its implementation. This project aimed to develop an 'optimal' process model, which would be integrated into a new case management system and be used in future cases. However, citizens and social workers' perspectives posed a challenge to the entire idea of a process. This paper shows not only that the process seemed different to citizens and social workers, but also that the social workers questioned whether the process existed at all.

According to the findings from this concrete setting, it did not make sense to simply think of different ways to reach a goal (Suchman, 1987; Schmidt, 1997). Rather, the insights from social workers led to a re-evaluation of the entire design process. As a result, this paper contributes to previous CSCW research into the incongruity between plans and action by looking at the process of 'making a plan.' This is accomplished by studying discretionary values among social workers in a participatory design setting. As previously noted in the conceptual reflections chapter, the concept of discretion has previously been envisioned as the freedom of street-level bureaucrats to amend prescriptions based on concrete cases encountered 'on the streets'. As such, this paper develops the concept of discretion beyond the previous two publications in that it explores how social workers articulate their discretion in the context of design.

The paper also makes a valuable contribution to political debates on public digitalisation and casts into question the very idea of digital-ready legislation as unproblematic. This paper shows how social workers can switch from one process to another, and combine them in different ways, based on the changes they hope to enact. Therefore, to social workers, it is not about different ways to reach a predefined end goal. Instead, social workers aim to influence outcomes, which requires an open-ended approach and discretion in the evaluation of each situation. Hence, the paper suggests that early design decisions should include discretionary values, and that participatory design should engage users to learn about their work practices, but also allow them to participate in important decisions about the problem to solve, and how technology is used.

Finally, this research paper makes a crucial contribution to the EcoKnow project and the case management systems designed for the study's particular setting by suggesting a shift in focus from legally defining outcomes to the case processes that produce them.

5.4 'THINKING PROBLEMATICALLY' AS A RESOURCE FOR AI DESIGN IN POLITICISED CONTEXTS

The fourth and final publication included in this dissertation is a peer-reviewed conference proceeding, published in the Proceedings of CHItaly 2021: 14th Biannual Conference of the Italian SIGCHI Chapter (CHItaly '21) and invited for presentation at the CHItaly 2021 – Frontiers of HCI conference18, July 11-13, in Bolzano, Italy. The paper is co-authored by Associate Professor Marisa Leavitt Cohn, Professor Thomas Hildebrandt and Assistant Professor Naja Holten Møller.

This paper has several purposes. First, it discusses the increasing use of AI to support political decision-making in the Danish public sector and how the hype around what AI may achieve often influences which problems AI is used to tackle. The paper notes how different epistemological views carry different understandings of what is considered to be the problem at hand, and how ethnographic perspectives often fail to match the dominant ideals and uses of AI, such as risk prediction. These issues have also been addressed in part in the other publications in this dissertation. This paper, however, takes a different approach by focusing directly on the political context in which EcoKnow operates.

Next, the paper reflects on the authors' own experiences while working on the EcoKnow project. Following Mesman (2007), we present three moments that had an important impact both on us as ethnographers and on the EcoKnow project. These moments show: 1) how the work discretionary practices of social workers turned out to be problematic during our encounters with industry and municipal partners, as they did not align with the 'charismatic' promises of AI; 2) how reliance on legal processes challenged the inclusion of social workers' perspectives in the design process; and 3) how the charismatic promises of AI became visible through the multiple forms of 'readiness' defined outside the project, which came to work against the ethnographic approach of recognising a breadth of factors that influence work beyond rules and standards.

The paper then uses 'problematisation' (Bacchi, 2012) as a method to address our challenges in a new light. The analysis was conducted by combining data from the entire period of fieldwork and using collective learnings to help us find solutions to our problems. In addition to this being an incredibly challenging exercise, it was also the most difficult paper I had to write as part of this dissertation. Putting together the findings involved multiple rounds of debates and disagreements between the authors - and was, therefore, also a great learning curve and exploration towards a shared understanding.

Finally, problematisation allowed us to realise that what initially appeared as individual challenges encountered in fieldwork actually formed part of a larger problem: in our case, the politicised context that lent voice to particular ways of approaching AI technology for public service delivery. In particular, we found how a national focus on 'readiness' to digital change (as seen, for example, in the Danish government's 'digital-ready' legislation (Agency for Digitisation, 2018b) had sneaked into the EcoKnow project and continued to have effects well into the life of the project. As such, this paper is also an example of the difference made by who gets a say in AI design and how we must remain attentive to the power relations between

18 https://chitaly2021.inf.unibz.it/

different knowledges. Using problematisation to understand the ideological framework in which we operated as ethnographic researchers, and in the project as a whole, is what eventually allowed us to understand the purposes it serves - and though this understanding, we were in a better position to respond.

As a result of our findings, this paper serves as a bridge between our initial and revised understandings of our challenging experiences in the field. Although these experiences are crucial for shaping research and addressing and negotiating challenges during fieldwork, they rarely find their way into research outputs (Howcroft and Trauth, 2008; Lechelt et al., 2019). Building on this, and on the ongoing discussion in CSCW and HCI about 'bridging the gap' between ethnography and design (e.g. Plowman et al., 1995; Forsythe, 1999; Dourish, 2006; Blomberg and Karasti, 2013; Schmidt and Bannon, 2013; Khovanskaya et al., 2017), our contribution is a methodological discussion of how researchers and designers might collaboratively engage with problematisation to develop an open-ended approach to AI design in political contexts, such as child protection cases and welfare benefits cases.

Having discussed the findings and contributions of each publication in this dissertation, the following Chapter 6 concludes the first part of the dissertation with a reflection on the coherent themes in my contributions and their implications for research and practice.

CHAPTER 6: CONCLUSION

In this dissertation, I have argued for the necessity of a more nuanced understanding of discretion in relation to public digitalisation. With an eye to the Danish public sector, I have reviewed and discussed different scholarly perspectives on discretion, and proposed the integration of discretion with CSCW studies on practice-oriented design. CSCW research has long shown that decisions about technology design are based upon assumptions about work. The same can be said of the discretionary practices of street-level bureaucrats, such as the social workers whom I studied. In the contexts of public digitalisation, discretion is a hot topic; however, the definitions are limited and often overlooks the perspective of social workers. When the Danish government claims that emergent technologies, such as automation and AI, can make *"better decisions"* than human social workers, they do so without first building an understanding of how decisions are, in fact, made in practice.

Using ethnographic data collected over a three-year period from two Danish municipalities, this dissertation challenges the dominant discourse of discretion by combining studies of discretion and practice-oriented research from within CSCW. In academic and public debates, discretion is often viewed as a 'subjective' and 'random' engagement with pre-defined prescriptions in practice. Thus, public digitalisation efforts have long been focused on reducing the authority of street-level bureaucrats through the introduction of increasingly advanced technology in casework. My dissertation, however, contradicts the common understanding of discretion. My findings suggest that discretion is a collaborative accomplishment, as it occurs in everything social workers do, from gathering, organising, using, sharing, presenting, and recording information. In contrast with previous studies, my results also indicate that discretion is not *just* about finding different ways to reach a pre-defined end goal. More especially, social workers use discretion to explore possible opportunities and influence the outcomes of cases - before, during, and after technological changes occur. As a result of my dissertation's cumulative findings, I suggest a shift of perspective; moving from considering discretion purely as an individual's implementation of policies and technologies, to seeing it as a collaborative achievement and an integral part of designing technological change. The results of my research lead me to answer my research question in the following section.

6.1 STATUS UPDATE: IT'S COMPLICATED

My dissertation is guided by the research question: What is the relationship between discretion and public digitalisation? To put it simply, it is complicated. The relationship between discretion and digitalisation is situated, complex, diverse, and dynamic, just like any relationship. Similarly, there is no single way to define it. The solution that works in one case may not be the solution in another. Depending on the technology, the complexity may also vary. Instead, my comparison of discretion and public digitalisation is meant to shift the current perspective of this relationship from one that places power and responsibility on the one hand, to one that acknowledges the mutual interdependencies that develop across different perspectives and in practice, over time. Therefore, it is not enough to say that public digitalisation simply "enables better decisions" or that it cannot assist street-level bureaucrats in their practical work. Emerging technologies, such as AI systems, have evolved over the past few years and have become capable of handling complexity in ways that were unimaginable only a few years ago.

In addition to opening up new possibilities, these technologies are also capable of altering how public services are viewed, approached, and delivered. While my dissertation recognises important limits of the technologies, such as the predetermined order that is necessary for algorithms to work (Petersen el al., 2021), their potential is forcing us to think carefully about how we want to design public services and welfare systems in the twenty-twenties – and whose interest they serve. More crucially than ever, we need to consider the perspective of those who are directly involved in the implementation of these systems. To achieve this goal, different stakeholders and key decision-makers must have a genuine willingness to include and take serious the perspective of currently excluded groups, such as the social workers – and be willing to invest the time and money required.

It is the hope that this dissertation, by providing nuances to the relationship between discretion and digitalisation, may contribute to more balanced debates, and enable multiple perspectives to benefit from new technologies in a way that allows for all voices to be heard, including the voice of social workers. In this context, the concept of discretion may be viewed as one way of fostering interaction that maximises human skills while still leveraging on the powers of computational support.

To reach this goal, this dissertation takes a modest, but significant step with its conceptual, empirical, and analytical contributions, as well as suggestions for future research. The contributions are presented in detail in the previous Chapters, as well as in the publications which are included in Part Two of this dissertation. However, for the sake of clarity, the main contributions are reinitiated below.

6.2 SUMMARY OF CONTRIBUTIONS

This dissertation makes several contributions to both research and practice. To begin with, it makes a number of contributions to CSCW as a research field, particularly by introducing the concept of discretion as a research object and social work as a field of study. Second, it makes both empirical and analytical to the study of discretionary practices in social work and their implications for technological support. Moreover, my contributions extend beyond CSCW, as my findings and implications are important for a wide variety of academic fields and practical purposes. A short recap of my contributions are given below, followed by some suggestions for future research.

6.1.1 CONCEPTUAL CONTRIBUTIONS

My conceptual contributions speak directly to the assumptions surrounding the relationship between discretion and public digitalisation, and particularly to the tendency to place discretion at the end of technology implementation. Current research suggests that discretion follows design, as street-level bureaucrats, such as social workers, tailor standard procedures to the context of situated practice. My dissertation empirically shows that this view ignores how discretion may be used collaboratively to infuence or inform design.

Re-framing the relationship between discretion and public digitalisation and bringing CSCW attention to the study of discretion and public digitalisation can therefore help to expand the scope of CSCW scholarship to these areas, which have not yet received much attention from CSCW scholars. My dissertation further contributes to a CSCW perspective on discretion by building upon and expanding the following CSCW concepts: 1) My dissertation expands the

notion of situated actions (Suchman, 1987, 2007) and the concepts of maps and scripts (Schmidt, 1997), by shifting attention from different ways of 'following a plan' to the ways in which social workers might exercise discretion as part of 'making a plan'. 2) Using the concepts of 'invisible work' (e.g. Bowers et al., 1995; Suchman, 1995) and 'classifications' (e.g. Bowker and Star, 1999), my dissertation also expands the scope of work that others make visible, to explore how social workers exercise discretion and make moral judgments to keep their work (and classifications) invisible to others, outside contexts of use. 3) Finally, I extend the work on co-design and values in design, particularly influenced by Participatory Design, by empirically exploring social workers' articulation of discretion when co-designing new technologies.

6.1.2 EMPIRICAL CONTRIBUTIONS

In addition to conceptual contributions, my research extends the empirically informed literature on discretion in the context of public digitalisation. Previous work has given a great deal of attention to discretion and the rules and standards that influence it, but few have taken a broad perspective on discretion to examine it 'on the ground', and as part of 'naturally occurring' events. My research contributes by providing empirical insights about the discretionary practices and values of social workers in Danish municipalities - before, during, and after a design process. The empirical contributions I make are not only relevant for design, but also for technology in general. In more detail, they are related to the knowledge of how to build the technology, what features to include, and how to make it useful in practice.

My contributions also goes well beyond empirical knowledge on discretion, as I have empirically examined different aspects of practice in social work. One example includes the findings from Publication Two of this dissertation (Petersen, Christensen, et al., 2021), which contribute with new knowledge on the work that social workers 'would never write down', and their moral protest against the idea of using citizen-related information to make any kind of prediction. Another example includes the reasoning offered by social workers in Publication Three (Petersen, manuscript), when justifying their disapproval of pre-defined outcomes of cases.

Lat but not least, my contributions also relate to the analytical framework within which my empirical work is conducted, and which has implications of broader significance.

6.1.3 ANALYTICAL CONTRIBUTIONS

Due to my own analytical commitments, my empirical findings also contribute with alternative approaches to the study of discretion and public digitalisation, and challenge the analytical assumptions and orientations of current research in this area. Typically, prior studies of discretion lack a critical assessment of the definitions they use and their assumptions. When certain perspectives are dominant, there is a risk that they will suppress the influence of other perspectives, assuming that certain problems need specific approaches (Evans and Hupes, 2020). Furthermore, the approaches risks imposing theories on the situation of others.

Thus, in taking an ethnomethodologically inspired approach to ethnography, this dissertation expands the analytical scope of discretion by refraining from giving accounts and explanations of members' values, beliefs and judgements, and instead analytically examining how these are organised and produced in members' own accounts, and how they are embedded in practice (Hall et al., 2014).

Finally, my dissertation uses 'problematisation' (Bacchi, 2012) as an analytical 'reflector tool' to reveal the political influences on research into discretion and public digitalisation, and contribute with a discussion of how researchers and designers might collaboratively engage with problematisation to develop an open-ended approach to the design of emergent technologies in these and other sensitive contexts.

6.3 DIRECTIONS FOR FUTURE RESEARCH

Despite the important contributions my dissertation makes to the relationship between discretion and public digitalisation, we are still a long way from acknowledging and addressing the many nuances of discretion and its engagement with technology. As I have argued throughout this dissertation, much of it depends on the way we define the problem to be solved and how technology is seen as a solution.

I hope my findings will inspire researchers to conduct additional empirical studies on discretionary practice, which will foster the development of new technology and help us to know more about its limitations and scope. The CSCW discipline has an important and timely task: to work towards an appropriate balance – both for the social workers whose discretion is up for consideration, and certainly also for the citizens whose lives are affected by the decisions that are made. This involves regaining the trust of social workers in the eyes of key decision makers and turn focus back to an emphasis on democracy and participation as key drivers for digital growth.

Since I began my PhD studies in 2018, an increasing number of studies have begun to consider the practical aspects of discretionary reasoning and use and supported the findings of this dissertation (e.g. Møller et al., 2020; Ranerup and Henriksen, 2020; Flügge et al., 2021). Together, these studies contribute to further nuanced discussions about discretion, its influence, and its use. Nevertheless, we continue to see a wide tendency to treat discretion and public digitalisation as opposing concerns and competing interests. There is more to this than all the ongoing optimism and hype about AI and the promises it will make everything better. It also refers to the opposite critique that it will not work at all. In a recent Danish news article, it was stated that "*Artificial Intelligence is useless in the social security office*" [19]. Several of my findings in Publication Two (Petersen, Christensen, et al., 2021) are described in this news article, in which I highlight possible applications of artificial intelligence to my research and address the nuances of technological support. In this way, the example illustrates how easily nuances are overlooked. Thus, I believe that the question I address in this dissertation continues to be pertinent going forward.

Furthermore, it should be clear by now that that discretion is not the only practical link that can be made between public digitalisation and social work practice. The next generation of research might take a broader view to understand how social workers make decisions and what other types of factors influence them.

Similarly, future research may also consider the perspective of citizens. This is particularly relevant as part of sensitive cases, such as those involving child protection and welfare benefits,

[19] https://politiken.dk/viden/Tech/art8192731/Derfor-virker-kunstig-intelligens-ikke-Sagsbehandlere-holder følsomme-oplysninger-for-sig-selv

where people's needs, actions and outcomes (and in many cases, their future) are often defined by others – including the social workers who are responsible for their cases. Just as the definitions we make about discretion and public digitalisation can have major consequences for the way we think about their role now and in the future, so can the words used to describe citizens. Similarly, these words may not be the same ones that citizens would use to describe themselves.

Finally, future research might similarly engage in understanding the perspectives of others, for example, the system developers who are responsible for translating and transforming social workers' records into machine-readable formats.

Combined, these studies may contribute with new insights into public digitisation and its relationship to various aspects of work, thus enhancing our ability to understand and facilitate technological change.

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PART II

PUBLICATIONS

PUBLICATION 1

THE ROLE OF DISCRETION IN THE AGE OF AUTOMATION

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The Role of Discretion in the Age of Automation

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Abstract. This paper examines the nature of discretion in social work in order to debunk myths dominating prevalent debates on digitisation and automation in the public sector. Social workers have traditionally used their discretion widely and with great autonomy, but discretion has increasingly come under pressure for its apparent subjectivity and randomness. In Denmark, our case in point, the government recently planned to standardise laws to limit or remove discretion where possible in order for automation of case management to gain a foothold. Recent studies have focused on discretion in the public sector, but few have examined it explicitly and as part of real cases. As a consequence, they often leave the myths about discretion unchallenged. Inspired by the literature on discretion and CSCW research on rules in action, this study reports on an empirical investigation of discretion in child protection services in Denmark. The results of our analysis provide a new understanding of discretion as a cooperative endeavour, based on consultation and skill, rather than an arbitrary or idiosyncratic choice. In this manner, our study contradicts the myth of discretion inherent in the automation agenda. Correspondingly, we ask for attention to be given to systems that integrate discretion with technology rather than seek to undermine it directly or get around it surreptitiously. In this age of automation, this is not only an important but also an urgent task for CSCW researchers to fulfil.

Keywords: Social work, Decision-making, Discretion, Administrative work, Casework, Rules in action, Automation, Digitisation, Digital-ready legislation

1. Introduction

Decision-making is considered to be at the heart of social work, involved in everything social workers do throughout assessment, planning, execution and evaluation, in relation to the development and well-being of children (e.g. O'Sullivan 1999; Ebsen 2018; Nyathi 2018). As Lipsky (1980) demonstrated, these decisions are made with room for discretion to interpret and modify formal rules concerning which activities to inspect, which evidence to examine, which inferences to draw and which actions to take (Black 2001). In Denmark, for example, social workers have traditionally been given a great deal of autonomy to use discretion, but their decisions have increasingly been accused of being subjective and random. Discretion is considered pivotal in this sense (Høybye-Mortensen 2013) and lack of trust in social workers' competence and ability to exercise discretion well has led municipalities to increasingly rely on manuals in an attempt to regulate their discretionary freedom (Høybye-Mortensen 2014, p. 73; Ponnert and Svensson 2016). A belief has risen that increased scrutiny will help improve the practice

of social work, and recently discretion has become the prime target for automation in the public sector.

In the summer of 2018, the Danish government reached an agreement to simplify new legislation in order to promote automated case management. This is seen as part of the government's overall strategy of developing a more digital public sector. In this respect, great emphasis is placed on digital-ready legislation, because current laws are seen as an obstacle for change (Digitaliseringsstyrelsen 2018). As a prerequisite for automated case management, digital-ready legislation is designed to replace 'subjective criteria' with 'objective criteria' (Justesen and Plesner 2018). As part of this strategy, every possibility to phrase criteria in a manner that minimizes the use of discretion is to be used (Digitaliseringsstyrelsen 2018). This strategy explicitly considers discretion inferior to automation, but it also contains a number of more implicit claims about the nature of discretion. For example, it assumes the existence of a noise-free relationship between human reasoning and formal decision-making procedures and that casework can be reduced to an entirely objective and decontextualized operation (Webb 2001, p. 69). Furthermore, it is based on a dubious attitude towards discretion, defined as an arbitrary and capricious exercise of individual authority that may be inconsistent with a successful implementation of service delivery.

Many studies have discussed the significance of discretion in the public sector and reported on its impact on rules. The majority of these studies are interested in the space left for frontline employees, such as social workers, to use their discretion. However, most of them study discretion in silos and extracted from real-life application. Hence, they seem to pass on the myth of discretion without examining it further. We believe this is an issue that may be caused by a lack of exploration and understanding of the implicit and often 'taken-for-granted' details of decision-making and its distribution in social work practices. Research in CSCW has drawn attention from a number of academic groups interested in technology development particularly due to its focus on the practices of cooperative work and the need to study the work domain closely. Although CSCW research has generally paid little attention to discretion, its long-standing focus on rule-based practices has been found useful for this study because it helps to recognise the actual use of discretion from the standpoint of the social workers who are the ones making the decisions about what to do. Based on our findings, we argue that the widely held idea of discretion as inferior to automation is based on a misconception about discretion itself. By foregrounding the backstage elements of discretion, we examine its nature as part of decisions made in casework. This unpacking of discretion is important, because it strengthens its position against the idea of eliminating it. We also hope it will provide sceptics with sufficient reason to doubt the current assumptions made about discretion and give them greater confidence in the judgement of the operatives to whom decisions are delegated.

The remainder of this paper is structured as follows: Section two will describe related research on discretion and rules in action and introduce the main analytical outlook of the study. Section three will describe the research setting and methods used to conduct the study. Section four will describe the myth of discretion as encountered

in this study and provide some amplifications. Section five will present the findings derived from the empirical analysis. Finally, section six will present a discussion of the findings and implications for CSCW which we hope will be acknowledged when developing technologies with automation at centre stage. What might be the consequences, for example, of attempting to remove social workers' discretion and leave their decision-making to an algorithm? Assuming that discretion can be reduced or removed in some areas, what will be lost and what will be left? We will also consider not only the possibilities but also the desirability of bringing discretion under control. Upon providing our perspectives, we will conclude this paper by presenting our final remarks and suggesting a future research agenda for CSCW researchers.

2. Related research

In this section we present an overview of related work in order to evaluate the findings across studies and to identify the open issues that motivate our work. We will start with an account of the literature on discretion as it relates to administrative work, before we go on to consider CSCW research on rule-based actions. The three areas covered below include 1) perspectives on the relationship between rules and discretion, including 2) the influence of growing digitisation and 3) how we conceive formal constructs such as the law versus how they are carried out in practice and according to the current casework situation. We conclude the related work section by showing how the seemingly diverging research streams dealing with these topics can be used in combination as a resource for our analysis.

2.1. Rules and discretion in social work

The discretionary power of front-line workers has been recognised since the 1940s (Kosar 2011). It was later formalised by Lipsky in his working paper on 'street-level bureaucrats' from 1969 (Lipsky 1969) and explicated more comprehensively in his book from 1980 on the same topic (Lipsky 1980). Prior to this work, the interest in lower-level employees was often ignored or dismissed by the bureaucracy (Zang 2016) and it was assumed that rules were easy and clear to operationalize and that they were decided from the top and simply implemented by practitioners (Gilson 2015). Lipsky contradicted this view and argued that the true power lay in the individuals who exercise wide discretion as they carry out the actions required by the rules. Lipsky's bottom-up approach to policy implementation became a classic and laid the foundation for a shift in the literature on discretion. It has been useful in exploring how front-line employees may have more discretion than would be apparent. It gives meaning to rules as being abstractions until they are realised when applied in practice (Zang 2016) and highlights the significance of discretion by positioning it as an unavoidable aspect of the application of general knowledge (Wallander and Molader 2014). Subsequent research followed in the footsteps of Lipsky, such a Wagenaar (2004) who places discretion at the core of administrative

work and calls the end-goals of processes 'effectuations' and 'enactments' of the 'hidden' and often 'taken-for-granted' practices that discretion is a part of.

The concept of discretion has since been developed further and building on the tradition of street-level bureaucracy, the concern in the literature shifted to the increased demands for standardization and efficiency in social work practice (Ponnert and Svensson 2016) and its impact on discretion. In Denmark, for example, social workers have traditionally been given a great deal of autonomy to use their discretion, but their decisions have increasingly been accused of being subjective and random and their use of discretion is considered pivotal in this sense (Høybye-Mortensen 2013). Lack of trust in social workers' competence and their ability to exercise discretion well has led to increased reliance on manuals in an attempt to regulate their discretionary freedom (Høybye-Mortensen 2014, p. 73; Ponnert and Svensson 2016). An often-debated theme in this context has been the question of whether the discretionary power of social workers have been reduced or eliminated. To avoid an all-or-nothing approach, a few researchers have analysed different aspects of discretion to explain its extent and variation. In their investigation of discretion and the causes that permit it, Vega et al. (2013) distinguish between 'formal' and 'informal' discretion where formal discretion is allowed within rules and informal discretion exists outside the body of rules. They argue that formal discretion occurs when policies and procedures are broad and vague and among other things can generate misinterpretations. Informal discretion, on the other hand, is the result of inadequate evaluation mechanisms of rules (Vega et al. 2013, pp. 105–106). Building on this, they find that while the context that permits informal discretion cannot be changed, more concrete and focused policies and procedures could minimise formal discretion (Vega et al. 2013, p. 113). Other studies have found that discretion is not necessarily lost when more rules are applied, because the space for discretion is not static but constantly changing depending on each situation (Evans and Harris 2004). As a case in point, Svendsen (2016) found that legal criteria are not always prioritized in social workers' decision-making in Denmark. To help explain the various ways in which discretion can be carried out, Høybye-Mortensen (2014, p. 75) further divides discretion into three levels, ranging from 1) low degrees of freedom where there is freedom to make a judgement in relation to the use of rules, across 2) slightly greater degrees of freedom where ultimate freedom is given to make decisions within applicable rules, to 3) high degrees of freedom where both decision and the criteria for decision-making are left in the hands of the social worker.

Analysing discretionary space may help us to understand social workers' experience of the rules regulating the processing of cases and what there is freedom to do (Høybye-Mortensen 2014, p. 75) as well as where this freedom exists. However, it says nothing about what it means to use discretion and how that freedom is used. To answer these questions, Wallander and Molader 2014, p. 2) suggest extending the focus beyond the structural dimensions of discretion towards "discretionary reasoning". Discretionary reasoning may also be referred to as the epistemic aspects of discretion (Larsson and Jacobsson 2013) and can be described as "the cognitive activity carried out by an agent when he or she is making judgements and decisions

under conditions of indeterminacy" (Wallander and Molader 2014, p. 2). In this sense, discretionary space is concerned with the type of decisions social workers are given to handle during casework, whereas discretionary reasoning is about the justifications of these decisions (Berrick et al. 2015). A few studies have examined the reasoning of caseworkers and come up with conclusions that extend beyond the traditional idea of discretion as a space within which to exercise judgements. Based on empirical cases of debt handling in Sweden, Larsson and Jacobsson (2013) find that while the structural and procedural aspects of discretion to some extent have been brought down by an increase in standards, it has not changed the epistemic aspects of discretion. As an example, they describe how the discretion for case-workers to decide and plan their work process has been reduced, but that they still use discretion in the way they interpret and select what is important and not, such as in the way they reason and argue during decision-making (Larsson and Jacobsson 2013, p. 14). Another examination of decision-making within child protection services in Spain found similarities in the criteria based on which decisions are made, but differences in the weight they should be given and how they are interpreted by the social workers (Taylor and Whittaker 2018). The point here is that discretion is possible, and what is important is how it is used. However, this has not prevented legislators from trying to increase the regulation of discretion and more recently, it has become the prime target for digitalisation and automation of administrative work.

2.2. Digitisation of social work

According to Plesner et al. (2018), the digital transition of public services must be seen in relation to a constant reform pressure in various political areas, as the reforms also include changes that have implications for digitisation projects, such as when the Danish government reached an agreement in 2018 to simplify new legislation in order to promote automated case management wherever possible (Digitaliseringsstyrelsen 2018). Digitisation is often presented as an opportunity to further reduce or remove the discretionary freedom of social workers (e.g. Zeleznikow 2000; Keymolen and Broeders 2011; Cheraghi-Sohi and Calnan 2013) by replacing 'subjective criteria' with 'objective criteria' (Justesen and Plesner 2018). Here, computers are explicitly viewed as 'objective' and thus more reliable in contrast to discretion which is often accused of being subjective and random (Høybye-Mortensen 2013). Furthermore, a number of implicit claims are made about the nature of social work, such as assuming the existence of an objective and decontextualized case processing and a noise-free relationship between subjective reasoning and formal decision-making procedures (Webb 2001, p. 69). In this world, the social worker has little to do with making decisions, as the aim of rules is precisely to reduce discretion. Others argue that discretion cannot be removed, but only transferred to new actors. For example, Bovens and Zouridis (2002) find that while many decisions may no longer be made at 'street-level', they have been taken over by technology and programming developers who now hold the discretionary

power as 'system-level bureaucrats'. In a more recent paper, Alkhatib and Bernstein (2019) draw on the theory of street-level bureaucrats to phrase the tension between human reasoning and algorithmic decision-making. They introduce the theory of 'street-level algorithms' as the algorithmic systems that make decisions on behalf of people and in a critique of the same, they point out that, unlike street-level bureaucrats who reflexively refine their decision criteria as they reason through a novel situation, algorithms at best refines their criteria only after a decision is made. In this view, discretion has been transferred into something that is no longer discretion.

Most hold that the increasing technological advances hinder the ability to exercise discretion, but some argue for a different point of view. In his case study on discretion, Evans (2010) find that while management attempts to control and direct practice, the effectiveness of the systems is very limited in its capacity. He points out the mistake of believing that software claiming to be emblematic of management control will inevitably result in this control (Evans 2010, p. 381). Another study shows that technology is not simply a constraint to frontline discretion, but rather extends discretion, as it is unable to capture the informal dimensions of the decisions made by operators and thereby obscures their use of discretion (Jorna and Wagenaar 2007). Moreover, it has been argued that rooting decision-making in a technology-driven practice completely ignores the complexity of actual decision-making in social work (Webb 2001). For example, automation can elide or exclude important human values and necessary improvisations that depend on a narratively intelligible communication between people that is not reducible to software (Pasquale 2019). Besides, it may not always achieve good governance as the use of discretion could optimise the individualised services based on specific citizen needs and unique situations (Varavithya and Esichaikul 2005).

Despite a great deal of attention given to discretion and the rules and standards that influence it, there seems to be a lack of research empirically investigating its practice as it naturally occurs. The concept of discretion is central to many of the previous studies in administrative work, but few have examined it explicitly and as part of real cases. Since the early days of Lipsky's study of public bureaucracies and the individuals who work within them, discretion has mainly been considered an action at the level of the individual as permitted by law, regulations and established practice. This view has largely been left unquestioned in both public, academic and political discussions (see, for example, Wallander and Molander (2014) and Møller (2016) who use vignettes of fictive cases on individual respondents to identify discretionary reasoning). We believe this is an issue that may be caused by lack of exploration and understanding of the implicit and often 'taken-for-granted' details of decision-making and its distribution in social work practice. To understand this better, we will now proceed with a brief summary of existing work addressing this concern.

2.3. CSCW perspectives on rule-governed action

While the CSCW community has paid little attention to discretion, it has been dedicated to improve our understanding of the practices of cooperative work and

to the exploration and design of technology with explicit concern for their intended users (Suchman 1989). The need to know more about cooperative work dates back to the office automation movement in the 1970s and a recognition of the lack of knowledge about how groups work and about how technology and standards affect them (Redaelli 2015, p. 38). At this time, researchers in cognitive science perceived action as simply being routine activities and repeated execution of planned procedures (Randall et al. 2007, p. 216). The research at this time was largely influenced by assumptions like those of Zisman (1977), who wrote:

> 'Once a clerk is told about a situation, s/he can consult a predefined procedure (formally or informally) to determine what action should be taken by the organisation. The organisation does not rely on the clerk to decide what to do; instead the organisation provides a procedure which instructs the clerk how to react to the situation.'

The office automation literature embedded models of work in systems as if they were 'computer-executable versions of what actually happened' (Pycock 1999) and reduced work practices to routinised workflows. Not surprisingly, the idea that formal constructs (such as plans, rules and procedures) adequately or fully describe action quickly ran into problems, and they did not have the impact or acceptance that was initially expected. By paying attention to the handling of 'exceptions', study after study demonstrated how it was often necessary to deviate from plans in light of the unfolding situation to get work done (Rouncefield and Tolmie 2016, p. 76). In direct contrast to the view of cognitivism, Suchman (1987, p. 178) proposed that: 'actions are always situated in particular social and physical circumstances so that the situation is crucial to the action interpretation'. Her situated approach suggests that formal constructs can never determine action. In her view, they function as 'resources for situated action but do not in any strong sense determine its course' (Suchman 1987, p. 52). In that sense, they are formulated in the perspective of the end result to be achieved (for example the well-being of a child), but with little focus on how to reach that end. This complaint also attacks the individualistic bias in office automation and other methods at that time by acknowledging that action is essentially a collaborative achievement (Suchman 1987, p. 47). Suchman's work and shift in perspective was an eye-opener in CSCW. It strongly impacted the community and several researchers have built on her insights. It led many to the generalised interpretation that systems should simply function as 'maps' that orient actors' behaviour, but in no way specify the steps towards an accomplishment of their tasks (Cabitza and Simone 2013, p. 501). It also led to a reluctance towards designing systems which regulate coordinative activities (Schmidt 2011).

In a detailed discussion of Suchman's work, Schmidt (2011, pp. 144–145) argues that formal constructs may play a weak role as a 'map', but depending on the situation they may also play a strong role as a 'script' where they serve as instructions to actors of possible or required next steps. By analysing situations where formal

constructs are defined and used, he shows that in some settings they are routinely applied as unproblematic guidelines or instructions and, in these cases, they play the role of a script that determines actions in a far stronger sense than that of a map. In other words, formal constructs in themselves are not fixed, but situated just like Suchman demonstrates for action (Christensen 2013). According to Schmidt (2011), the problem with Suchman's viewpoint is to be found in the way she adopts the cognitivists' reading of formal constructs as abstract generalisations and therefore leaves this view unchallenged. Instead, he argues that formal constructs are to be understood as 'normative devices', meaning that 'they provide criteria for whether or not a particular action is correctly executed' (Schmidt 2011, p. 366). They do not necessarily require interpretative work as argued by Suchman, as this only takes place when doubt arises concerning the sense of a formal construct or its application of use (Schmidt 2011, p. 145). Through a conceptualisation of formal constructs as normative devices, it was, as noted by Redaelli and Carassa (2018, p. 139), in Schmidt's interest to shift the focus from the how the significance of a formal construct is worked out in its situated use (Suchman 1987) to the study of how the activities that surround a formal construct depend on what it entails.

In Schmidt's opinion (2011, p. 145), the understanding of whether formal constructs serve as a map or a script depends on the extent to which it is possible to identify, analyse and model interdependencies in advance. It is furthermore not something that can be taken to be immediately obvious to the researcher as it is always internal to the particular practice and 'left to the persons whose task it is to decide such matters' (Schmidt 2011, p. 383). It is, therefore, a matter of empirical determination and something that can only be measured through direct association and first-hand participation in operational practice. According to Schmidt (Schmidt 2011, p. 142), a key issue with Suchman's perspective on situated action and the empirical studies that followed, is that none of them investigated the use of formal constructs in the everyday routines for which they are designed and therefore the findings do not warrant the general conclusions that have so far been drawn. Consequently, he claims that CSCW researchers need to investigate further 'what the rules of a particular practice actually are' by considering 'how the stated rule is observably used in the setting' (Schmidt 2011, p. 366 and 383). This task has later been picked up by Redaelli and Carassa (2018) who studied the practices of rule formulation in a ground control tower by demonstrating how circumstances not anticipated or provided for by plans are resolved.

Based on an acknowledgement of the contributions and limitations of the literature on discretion and cooperative rule-based actions, this study combines the two streams of research to inform the study of discretion in social work. We investigate both what constitutes the formal guidelines for making decisions about child protection services and the actual practices of how decisions are made as well as who is involved in making them. The primary benefit of this approach is that it allows us to show the relationship between rules and decision-making, while recognising the influence of the social context and the broader community surrounding discretion. In

doing this, we hope to provide a better understanding of the nature of discretion and the implications it might have for automation of case management in the public sector and perhaps more generally.

3. Method and setting

To analyse discretion, we performed a four-week explorative field study in a Danish municipality between autumn 2017 and spring 2018. The empirical material for the study was generated through observations, in-depth interviews and document collection. Observational notes served as a record of the thoughts, actions and feelings that arose during the time of the fieldwork. A double-entry style notebook was used for this purpose, meaning that each specific observation was followed up by an interpretation. Observations were performed on a day-to-day basis and used as a method in interviews and at meetings to keep track of the relationship between events (what participants do) and accounts of events (what participants say they did) (Jordan 1996, p. 33). We performed full day observations of the activities of five different social workers and participated in ten meetings, including internal team meetings and meetings between the social workers and other professional as well as citizens. Around 50 public and internal documents were collected during the research process and they served as an important source in developing an understanding of the municipality's local work practices and the framework within which the social workers operate. These documents covered e.g. law texts, internal reports, policy documents and process maps.

Interviews were used as a personal, in-depth method that allowed us to interpret the findings collected from other data sources better and to dig deeper into the decision-making processes, including the factors and indications that influence them. Interviews were carried out in situ where possible and after doing the observations, typically in the afternoon or the day after. Interview guides were used to balance thematic structure with room for participants to express their perspective and subjective understanding. The interview guides left an open space for questions to become constructed in the interplay between our evolving understanding as researchers and the set of activities we participated in. Furthermore, they were structured so that the majority of the questions required participants to answer by showing how a given aspect of work was performed in practice. Several employees from different departments agreed to participate in an interview, which led to a total of 21 interviews with 13 different participants. These included the five social workers whose activities were also observed, two lawyers, one administrative officer, one secretary and four employees from the digital and IT department. Most interviews lasted for about an hour and all interviews were audio-recorded and transcribed for analysis. While the complete empirical material functions as background knowledge, this paper mainly reports on the observations and interviews with the social workers, all of which hold a bachelor degree in social work and, at the time of fieldwork, had between six to ten years of professional work experience, except one who had only recently graduated.

The analysis was based on an iterative process of gathering together, listening, categorising, comparing and contrasting common themes and major issues found in the data. The coding of data involved the creation of labels and tags which, based on how frequently the issues were mentioned or observed and the level of importance they were given, led to the discovery and development of categories. In the process of collecting and analysing data, we focused our main attention on the reasoning process used by social workers at different stages of the cases. In doing so, we follow the recommendation by Harper et al. (2016, p. 211) suggesting that 'these reasons provide the bedrock of how choices are seen, accounted for and ignored'.

3.1. Setting

This study took place in the administration building of a Danish municipality, responsible for helping vulnerable children and families with general and special needs for support. The administration building consists of four departments, including 1) a family department with social workers, psychologists, language therapist, physiotherapist and occupational therapist, health care assistants and a family administration, 2) digitalisation and IT, 3) an administration for school and day care facilities, and 4) an economic secretariat. By the end of September 2017, when the field work for this study was initiated, 35 social workers were employed in the family department of which 22 worked under the 'classic' model in accordance with the Danish Consolidation Act on Social Services and 13 were involved in three-year test period of a programme called 'Styrket Indsats' (in English: 'Strengthened Effort'). Styrket Indsats is based on the belief that earlier intervention as well as proper support and broad cooperation with and around vulnerable families will help provide the correct solution to their problems and initiate action before their problems grow bigger. Furthermore, with increased policies beyond the minimum requirements of the law, the programme is believed to give social workers the opportunity to solve tasks and handle complex cases in a more secure manner. To make this happen, the number of cases dropped during the test period so that each social worker was handling around 15 to 20 cases instead of 35.

3.2. Ethical considerations

Personal privacy and other confidentiality issues are, of course, an important practical and legal consideration for all municipalities. All data we have collected, used and disclosed have therefore been handled in accordance with the rules of the municipality. Since we could come into possession of information of confidential nature, we also signed a non-disclosure agreement before doing the fieldwork. It was furthermore agreed that any personal information regarding citizens would be anonymised. By its nature, discretion is a complex and highly sensitive topic. It can evoke thoughts and feelings on a personal level and result in the expression of opinions, interests and judgements which may not be shared by others. This led to an

increased awareness in terms of protecting the names of participants and hence their risk of recognition. Every interviewee was invited to participate on the basis of informed consent, and a high level of cooperation was accomplished.

4. Preamble: the myth of discretion as 'subjective' and 'random'

Before moving on to the core of the article, it seems appropriate to start with a brief account of 'the myth of discretion' as we encounter it in the agenda on automation of case management in the Danish public sector.

Denmark is currently considered to be among the most digitalized countries in the EU (European Commission 2019) and the public sector is leading by example. Many administrative tasks and working procedures have already been digitised and recently, the strategies adopted by the public sector increasingly involve the use of automation. The Danish government's introduction of 'digital-ready legislation' in July 2018 is seen as one of the major steps towards this realization. It got full support from all parties in the Danish parliament who, in the beginning of the same year, agreed on making it mandatory for all future laws to be digitally compatible so that case processing can be automated as much as possible (Finansministeriet 2018). Seven principles have been developed to help meet this goal and among these is a reduction of discretion, while decisions in the future must be based more on objective criteria (i.e. *'objective criteria over discretion'*).

The freedom to exercise discretion is under pressure, because it is considered inferior to automation in this context. Discretion has been framed as a subjective and random activity which often creates a 'general problem' and 'stands in the way' of digitisation (Jensen 2017). However, we argue that this view of discretion and its 'inconsistency with successful service delivery', is truly a myth. During our observations and interviews, the decision-making activities of social workers were much richer than implied by AI proponents in the public sector. Still, the myth of discretion has characterised several debates within public digitisation in recent years. The removal of discretion in favour of automation have, among other things, been discussed at conferences[1], taught as part of courses on 'digitising discretion'[2] and referred to by the media as 'necessary for success' (Pedersen 2018). Remarkably, the question has been raised whether an algorithm should be able to replace the human decision of removing a child from home and comments have been made as to whether it would be better than having a 'random social worker' making up her mind, just because she somehow 'feels like it' (Frederiksen 2018). As these examples show, there exists a strong opinion in favour of automation and against discretion. However, digitising processes for the sake of it is hugely problematic. There needs to be good reasons for making changes of this sort, based on a solid understanding of the existing practices in any given work setting. To amplify, the myth of discretion as an arbitrary and capricious exercise of individual authority does not reflect what we have

[1] Danish conference on 'Digital-ready Legislation' held on September 19th, 2018

[2] Course on 'Digitising Professional's Competences' offered by Copenhagen Business School in 2018/2019

seen as part of casework and what we have learned from the social workers who use it as part of their work. Rather, as we shall go on to explore, it represents an image with no reality to support it.

Exploring the real nature of discretion is critical as the public sector is increasingly digitised. Therefore, the definitions we make when referring to discretion can have major consequences for the technologies we build and the way we think about digitisation and automation in the future. We believe it has become more important than ever to revisit discretion and understand what it means and how it is used, through those who know it best because they utilize it as part of their decision-making on a daily basis. In current public debates and public policies, an understanding of discretion is often taken for granted and left out of the picture. Having the removal of discretion as a precondition when talking about digitising the public sector, is therefore something we want to challenge as we argue that it is often based on a misconception of what discretion it and how it works. In the analysis below, we will attempt to change these behaviours by presenting an alternative view of discretion.

5. Discretion in social work

In the following, we will analyse and describe general principles and concrete, practical examples of decision-making tasks in social work and social workers use of discretion as part of making these decisions. We will point to a conceptualisation of discretion as a collective activity that problematises both the desirability and possibility of separating it from the decision-making process. Hence, we are interested in shifting the focus from the individual to the community of practice and the relationships within which social work decisions are made and realised. We will begin by discussing which decisions can be formally involved in casework. Then, we will examine the rules available and how they are "approached" in practice. Particular attention will therefore be given to the reasoning justifying decisions and how they were made, with emphasis on the role of discretion in this context.

In working to protect children, social workers are presented with a variety of rules that play an integral part in carrying out their responsibilities. In accordance with the Danish Consolidation Act on Social services, the rules provide a framework of decisions required during casework (Ebsen 2018). Based on the law and the findings from our studies, some of the common decisions social workers have to make are related to the following:

(1) Examination of a child
(2) Documenting a child's needs
(3) Decision on precautions or dismissal
(4) Making suggestions to an action plan
(5) Decision on action plan
(6) Implementation of action plan
(7) Following up on action plan

This order of decisions reflects the procedural nature of the law; regulating the forms under which different types of information can and should be collected and recorded, when and how to pass on information and to whom (Svendsen 2016). However, reading the instructions tells us very little about how they are being followed in practice (Redaelli and Carassa 2018, p. 121). As one of the social workers puts it:

> 'We operate a bit with like: "blue", "green" and "red". Blue are the hugely structured, those who just prefer when things are in structure and in boxes and "I know I have to do this and do that and" […] Then there's the green […] Those that just throw, I don't know how many, ideas in and are really good at thinking creatively and differently and breaking those very linear ways of thinking in relation to visitations, recommendations, precautions and so on. Then there's the red who are very much like, socially minded, right… and I'm not blue.'

This means that in to understand the decisions made by social workers, we need to determine the meaning of the rules locally (Schmidt 2011), i.e. through the actual work of following them. The inherent complexity and uncertainty involved in social work means that each phase can reoccur anytime and that many other decisions can occur at the same time, while the social workers move back and forth between them. Therefore, the order of decisions may not reflect an order of how they are made, as it depends on the circumstances of the individual case (Ebsen 2018). In practice, of course, things might not work out as neatly as the previous paragraphs imply. In social work, decisions are highly interlinked and dispersed among multiple actors and the distinction we made here is for analytical purposes only. In what follows, we will use the order of decisions to structure our findings of discretion and draw up our results towards the end of each section. Building on this, we will note potential design implications.

5.1. Examination of a child

Municipalities in Denmark are legally responsible for treating all referrals of possible abuse and neglect of children and provide support and help to vulnerable families. Their first task is to decide whether or not to carry out a further assessment of a child. The municipalities, however, are free to adapt their administration to local circumstances and decide what kind of organisational structure is preferred, and which decisions should be allocated to the social workers. In the municipality where this study took place, the first responsibility of the social workers is to perform an examination to evaluate the needs of the child. In the words of one of the social workers:

> ‘A case starts in the reception where they make a preliminary target group assessment […] that is then sent to our leader”. When they [the reception] have made a target group assessment, it’s because one assumes that [the child] needs support according to the Danish Consolidation Act on Social Services. So, a decision has been made to perform a paragraph 50 examination, a child protection examination. And then we’ll get the case distributed based on factors such as available space, district of residence, special interest etc. This is something we do at our team meetings. And then it starts from there.’

The child protection examination is carried out by the social workers to look for signs that a child has been abused or neglected. Furthermore, he results derived from a child protection examination help the social workers give appropriate advice and support to citizens. However, while they may be required to perform this examination, the law provides little instruction on how to go about it in practical terms. To illustrate this, we will use examples from the law text of the child protection examination (Hørby 2015, p. 13) according to which the examination ‘shall to the widest possible extent be conducted in cooperation with the custodial parent and the young person aged 15 or over.’ The examination is among other things required to be conducted ‘as gently as possible in the given situation’ and it ‘shall not be any more comprehensive than required by its purpose’. In the course of the examination, the social worker ‘shall make an overall evaluation which [...] shall relate to the child’s or young person’s (i) development and behaviour, (ii) family, (iii) school, (iv) health, (v) leisure time activities and friendships and (vi) any other matters of relevance.’ To do this, the social worker ‘shall involve any professionals who already have some knowledge of the conditions of the child or young person and his/her family.’ There are thus many inputs for the same examination. Furthermore, in connection with the examination, the social worker ‘must assess whether to conduct an examination of any other children in the family.’ An examination of a child therefore does not only involve the child, but just as much its surroundings and cooperation with the family is crucial to the quality of the examination (Høybye-Mortensen 2014, p. 76). Finally, the examination ‘shall lead to a reasoned decision as to whether there are grounds for implementing measures and, if so, the nature of such measures’ and it ‘must be completed within four (4) months after the municipal council has become aware that a child may need special support.’

As the examples make clear, the examination is in some ways guided by rules that seem clear and easy to operationalize (e.g. conduct the examination, involve children aged 15 or above and complete the examination within four months). They apply to standards and routines and leave little room for discretion, as it would be safe to assume that the social workers would rely on the rules unless they have a good reason not to (Schmidt 2011, p. 144). Other rules, however, are broad and vaguely defined and require interpretation and demands judgment by the social workers (e.g. the examination should not be more comprehensive than required, the social workers shall involve any professional with knowledge of the condition of the child and

include any other matters of relevance). While defining *what* the social workers have to do, these rules do not explain *how* to do it. For example, they do not specify the methods used for collecting the information, what kind of information should be collected and when and from whom. Both the criteria for decisions, the weight that they should be given and how they should be interpreted are left in the hands of the social workers, giving them a large freedom to use discretion. This is emphasized by a social worker who explains the steps taken in the execution of the examination:

> '[Once the cases have been] distributed in our group […] we go visit them [the family] […] We have a background for visiting them. It can be, for example, that it's a single mother with two children, who's got problems with one of her children. Then we'll visit them and try to uncover what it's really about and talk to the mother and the children and, usually, we also have a conversation with the child. Maybe not the first time, but then we'll definitely do it the second time. And then you start to become a bit more curious about what this case looks like. And then you check your system, of course, if there has been something before and you get consent from the parents after going there and talking to them. And then you collect statements from the school, status from the school and what else you have. Also, if you have a statement from the school, there will usually be things that show up from there indicating that there's something that may need to be looked deeper into.'

In the quote above, the social worker demonstrates the unfolding nature of an investigation practice. It shows that while the rules provide a structure of the examination and suggest what is possible and feasible, the social workers are guided by an evolving understanding of the case. Work always takes place in a context that influences how it is understood and carried out (Wagenaar 2004) and the many unknowns make it impossible to know what may occur in the process to alter the outcome of a decision. The uncertainty requires a high level of flexibility and discretion in order to fit the changing circumstances. In this manner, the rules may frame discretionary practice by both explicitly and implicitly calling for its performance. The rules provide a guideline in terms of the type of information that can and should be collected, but they leave it to the social workers to decide what activities to inspect and what evidence to examine. The social workers described how these decisions are often made individually. However, sometimes, if they feel 'stuck', they may engage in discussions with team members or hand over the case to a colleague who can provide a different point of view. Furthermore, their decision on what to inspect and examine is influenced by conversations with other stakeholders rather than relying exclusively on the judgement of the individual social worker. This type of assessment, then, is clearly of a collaborative nature.

5.2. Documenting a child's needs

By requiring social workers to work closely with different stakeholders during the examination of a child, the law helps to make sure that the information on the child is

robust and that the social workers have a solid basis for convincing arguments in their casefile. The dynamic process of collecting information naturally affects the basis on which they are able to do this. As described, information on the child is being constructed in the dialogue between the social worker and the other parties involved. Furthermore, the documentation depends on the social worker's interpretation of the information (Høybye-Mortensen and Ejbye-Ernst 2018, p. 27). In practice, the regulation thus raises the question of how to understand the requirement of documenting a child's need. For example, when and how should information be registered and what type of information should be considered?

> 'It's still us who make the evaluations and the discretionary assessments, you can say, and we evaluate which documentation we back it up with, so I think discretion, well I think it's a lot of our decisions […] it's what you put emphasis on […] or evaluations you can say, because it also plays a part in supporting the verdict you then reach. Because it's us who make the evaluations, this is where we sort of judge based on the documentation we have.'

What elements the social workers choose to focus on, is thus crucial for how they later evaluate the information and, as emphasized in the quote above, they have a great freedom to define the criteria based on which their evaluations are made and the documentation is produced. The practice of writing up case notes and producing documentation is a legal requirement and is seen as a safety measure for both the citizens and the municipality. First of all, it forms an integral part of the provisions of care of the citizen and secondly, it can protect the social worker and municipality in instances where legal defence of their actions is required. For the same reason, the documentation must include anything that might impact the case (Caspersen and Laustsen 2009, p. 26). This, however, is often difficult or impossible to predict and since people and their social conditions are constantly changing, it depends on the social workers' interpretation. Social workers thus need an open mind to be able to make these decisions. This is related to being able to cope with the uncertainty about future actions related to the individual case, which requires a high level of discretion (Ponnert and Svensson 2016). As we learned from our field studies, this results in significant differences in regard to documentation practices and especially in terms of record keeping, including case notes, minutes of meetings, report writing etc. When asked about standards for record keeping, the social workers revealed a lack of rules and shared preferences with respect to how information is ordered or kept.

'I remember this was one of the very very very first things I asked for when I started here, because I came from a place where every record was kept so it was easy to get a hold on and easy to get an overview of. Then I asked them if they didn't have any guidelines for how to keep records. They had talked about making something. Interviewer: So it wasn't there? Social worker: It wasn't here. So everyone has their own, what can you call it, solution or method or [...] way of doing things. And I can also see, when I go in and look in our case notes, that many of us copy, for instance, a

mail correspondence, they can also copy that into the case notes where I think, that's just immediately what I think, no, that should probably not be there. That should probably be kept, I would keep a mail like that within "mail correspondences", and then whoever it is that you have had a correspondence with, so that you have all the documentation and with dates, and all that, instead of adding it to a case note.'

The individual approach to the ordering of information is made possible by the lack of rules, which in turn opens op for the social workers' freedom to use discretion. It gives them space to make their own judgments and choose their personal preferences in regard to structure (Larsson and Jacobsson 2013). It does not come without its complications, though. The documentation produced by the social workers also contributes to the circulation of information amongst the other teams involved in the treatment of a child. As illustrated below, this can create challenges during the parts of the process that are interdependent, such as when cases are handed over to a colleague. As another social worker explained:

> 'It's a huge task sometimes, if you have to find a special document, because you know it's there, you need it for something. It takes a long time [...] So no, there's not a system and I'm not really good at keeping a system either. Some are really good at making, like, folders [...] then they do like: what is this about, everything about access [with children] is placed in this folder, and then there's things like salaries, which is the foster family, and there's funding [...] I'm not so good at it [laughing] [...] I have more like the long list of documents.'

The above examples show that, in the absence of rules, the social workers make their own, more or less, idiosyncratic structures. They fill in the gap by creating their own rules and demonstrate how to handle circumstances that are not anticipated or provided for by the rules (Redaelli and Carassa 2018). While more concrete and focused policies may help standardise record keeping and thereby minimise discretion (Vega et al. 2013, p. 113), the current ways of working largely depend on the individual's routines, professional experience and personal preferences. Discretion thus seems to play a big role, whenever there are no rules available, and while the documentation practices contribute to the collaborative work between different people, it does not currently have an articulated structure that would otherwise contribute to the cooperation and coordination of work (Redaelli and Carassa 2018).

5.3. Decision on precautions or dismissal

The law requires social workers to make a decision based on the information obtained (2) and documented by them in their casefile (3) as part of a child examination. This is described in the law text where it says that the examination 'shall lead to a reasoned decision as to whether there are grounds for implementing measures.' (Hørby 2015). The social workers are responsible for making the evaluation of whether or not to take any further action and the citizens as such have no

legal right to influence the final decision. However, as previously mentioned, their participation in performing the examination is crucial. Has the citizen not been involved in this process, the social worker may be forced to make a 'bad' examination leading to a situation where they have to make a decision based on slender grounds (Høybye-Mortensen 2014, p. 82). When making a decision, the social workers must first analyse the information they have got access to. This work usually involves their colleagues and managers, for example at weekly team meetings where cases are discussed:

> 'Sometimes [...] we can be a lot in doubt, as you can argue for both. That can be for example, if they [a family] should get some kind of funding [...] should they get it or shouldn't they get it? [...] We discuss where to place the emphasis, and then we make the decision [...] but very often we talk about them at the team meetings [...] and in that way make it standardised, so it doesn't become different. Really, you shouldn't get something just because you have one caseworker instead of another. So, if it is brought up at team meetings for example, it's also to standardise it. But if I think, they apply for this and I believe I have the arguments for them not to get it, then it's not required that I ask my manager if it's okay that they don't get it.' Interviewer: 'So it's not every time you bring it up at the team meeting? Social worker: 'No I don't, I don't. Sometimes I think it's very clear they [the family] shouldn't get it [the funding] at all.'

Even though this example relates specifically to decisions concerning financial assistance for families, it has wider relevance, because it highlights both; 1) the opportunity to collaborate on decision-making at this stage and 2) the social worker's need to turn to colleagues for consultation and teamwork in difficult cases and when in doubt. It shows that collective negotiations may be part of judging, as an activity to align everyone's discretion to the wider organizational goals (Cheraghi-Sohi and Calnan 2013, p. 57) and, as the social worker mentioned, to avoid unequal treatment. During our time as researchers in the municipality, we participated in several meetings where cases were brought up for discussion and making individual judgment calls was generally seen as the exception rather than the norm. This supports the notion that social work practice is not an individual achievement or the sum of individual social workers' judgements. In the team meetings, the standards are available for others as grounds for assessing the reasonableness of one social worker's opinions or actions, made possible through the transparency of judgments that the team meetings bring about (Wagenaar 2004, p. 651). As such, the freedom to use discretion when making decisions on precautions or dismissal is high and to a certain extent, the discretionary practice is a collective activity. It may be based on the individual's need for sparring and alignment in making the final decision on whether or not any further action should be taken. However, the social participation in the community amounts to the social worker coming to behave in ways that are recognised by the group (Hammersley 2005).

5.4. Making suggestions to an action plan

If the social worker believes a child is in need of care and support, he or she will decide on precautions and draw up an action plan. The precautions are based on what is found to be challenging the child's development and well-being and it is legally required for an action plan to specify the purpose of the action as well as the action needed to achieve the purpose. Precautions can be everything from providing a contact person to intensive family care. However, if the social worker believes the child is facing an apparent risk, he or she must decide on the necessity of further investigation and consider if any immediate protective action is required, such as an out-of-home placement. In making this decision, social workers are guided by and act on the information they have access to. As illustrated by one of the social workers named Anna, this signifies a space for discretion within which they use their judgment to specify the conditions that should be taken into consideration.

> 'You have to be able to describe that there's an apparent risk for the children's development and well-being, and you can say it's very broad to a certain extent, but you have to document that it's so threatened […] it's very much from case to case, if it's present. And it can also be the case that you come in possession of information, suddenly, where there's been abuse or violence, then it also changes things, where you can then look at the case differently.'

Anna goes on to describe a case where a child protection examination resulted in her recommendation of removing a child with force. Her story concerned a mother with eight children, with two of them already placed in foster care. Anna's first task, when she took over the case, was to examine three of the mother's other children. Based on these examinations, Anna presented the parents with her recommendation of also removing these children from home. However, the parents would not agree to voluntarily give up their children and from this, an agreement was made to conduct intensive family therapy for a short and intensive period to evaluate the parents' skills and ultimately decide whether or not the children should remain at home. Anna described the process as follows:

> 'We started, after the family therapy had ended, to make a recommendation about placement to the committee for children and young persons, because they [the parents] wouldn't agree to placement in foster care […] Once this had been recommended, it didn't go through in the committee for children and young persons, so it came back to us [...] So they [the committee for children and young persons] had not identified the criteria for coercion as being fulfilled. What we then decided, in collaboration with the management, was that we contacted the Social Appeals Board for them to go and look at the case. They are like above us you can say, they can impose us to do some things. Because we did that, we had to send a lot of documents of the case to the Social Appeals Board as they had to shed light on whether the

children thrive well enough, and whether everything that has to be done has been done [...] They were very concerned. They then called in the parents for a conversation [...] to hear what the parents would agree to here. And they [the Social Appeals Board] didn't believe that the criteria for out-of-home placement without consent was fulfilled right now, but they were extremely worried, so they evaluated that there was a need for what is called an investigation of the parents' competencies […] They [the parents] said yes to this, they would like to do it. And this was then developed, and based on this, it was assessed that the children couldn't live at home […] But just because it [the assessment] is there, it's not enough to place the children in care. It then has to once again be recommended to the committee for children and young persons, so we did this [...] and this time it went through, and they were then placed in care.'

This rich narrative exemplifies a number of areas that are crucial to discretion. First, there is the many steps Anna is required to follow and in a specific order. As she describes, this limits her opportunity to influence the procedural nature of her work and thereby reduces her ability to exercise discretion (Larsson and Jacobsson 2013). Secondly, there is the way Anna describes the rules in action. In line with the findings by Wagenaar (2004, p. 646), she shows how 'the two work together to literally create the situation'. The rules work as a checklist of what is feasible (it works), acceptable (the reasoning behind her decisions will hold up when challenged) and rational (it complies with the legal requirements). In other words, Anna relies on the stipulations provided by the rules to do her job (Schmidt 2011, p. 144). Even though the rules do not and cannot describe her actions exhaustively, she makes it clear that they do not serve in 'as weak a role as a traveller's map', since they require her to do her tasks correctly, within a time limit and in a specific order. Nonetheless, her overall task of 'describing an apparent risk' is very broadly defined and in order to do this, she must select from, interpret and translate the information she has into legally binding decisions. How she applies the rules and performs such translations is situated and rooted in her use of discretion. This can also be seen in the way other people interpreted the same information differently and initially disagreed with Anna's recommendation of placing the children in foster care. Ultimately, as Anna's case description brings to light, the suggestion to remove the children is a process based on judgements not made by her alone but a whole team, including colleagues and managers (hence Anna's use of the word 'we' when describing the process), psychologists and lawyers, and eventually the committee for children and young persons. What is important here, are the various impacts on discretion and influences far beyond the level of the individual. These impacts and influences make discretion a cooperative activity by means of which various stakeholders contribute to its unfolding practice to different degrees and with different effect.

5.5. Decision on action plan

In addition to the influence of rules and discretion in practice, the example provided by Anna also helps to unveil the complexity and uncertainty involved in social work

and when making suggestions to an action plan. It shows that an assertive, but also adoptive approach to interactions and negotiations with other stakeholders can be crucial in reaching a judgemental decision. This is described well by Laura, another social worker, who shared her experience of the process of making a decision on an action plan and the reasoning behind the decision. She told us about one of her cases, involving a 16-year old girl who had been living with and moved between different foster families her whole life. According to Laura, the girl was happy to live with her current foster family and had no interest in moving. However, as the municipality went through the terms of the contract as part of their standard procedure, they were unable to reach an agreement that would allow the girl to legally stay with them for another year. The rules determined she had to move and the decision was made to move her to a new foster family. This resulted in the child making a formal complaint to the Appeals Council and at that point, Laura got involved in the case with an important decision to make: finding a new home for the child, even though the child was not interested in moving.

> 'I got informed by the Appeals Council that they have received this complaint from this child and in the meantime, I went to talk to the child to see if maybe there was another solution, as she didn't want to be moved to a new foster family. I said, but there might be another solution. You could be moved to your own room [her own place, such as a dorm], but with financial support. She considered that and then got back to me and told to me that she wanted to do it. And then she pulled back her complaint.'

The focus on meeting the needs of the individual child is explicitly stated in the law which says that help is organised 'according to the individual needs and circumstances and in collaboration with the individual.' Although in Anna's case foster placement was initially seen as the preferred option for the child, it is not the only option. In order to meet the heterogeneity of children's needs, the law provides a list of several placement types to choose from.

> 'It's mentioned in the law that you can get your own place. It's something I can go and read in the law text, what opportunities you have. It could be an opportunity as she was 16 years old at that time. If she had been younger, if she had been 14 […] or 15, then I probably wouldn't have thought of a room of her own. I probably wouldn't have thought that. But I think that 16 years […], actually, she was 16.5 and she was on her way towards 17, then I think; own room and then with support, yeah, you can do that'. Interviewer: "Does the law say anything about how old you have to be?" Laura: "No, I don't think it does. I'm thinking this is about making an informed guess and finding out; is this child even suitable […] because you can also be 16 and you can also be 17 years old and not be suitable at all for living in your own room. You can also be 14 or 15 and actually be really good at maybe living in your own room. Well, not that I think that's a good idea, it's really

not [laughing], I think they are too young. But if there's no other opportunities, or other solutions […] We have a lot that have been placed outside the home at 16 years old."'

While the law distinguishes between different placement types, it raises questions of how to understand the different provisions in a practical context (Svendsen 2016). For instance, does age matter and how? Laura explains how this is not the only factor she takes into account, and in her opinion, it is not the only thing that determines maturity. Nevertheless, her decision is influenced by a strong opinion of 14–15-year old's being too young to live in their own room. If the girl had been younger, it may have led Laura to suggest a different solution. This is not something we would have been able to reflect upon had we only analysed discretion as a space for making decisions left open by rules and standards, but through access to Laura's account of reasoning, the epistemic aspects of discretion become visible. When she brings to light the different factors and indications she weighs and considers when assessing what is reasonable, she furthermore uses the many out-of-home placements of 16-year old's to justify her decision. As such, her discretion can be said to be contained within the 'community of practice' (Lave and Wenger 1991) as it is influenced by previous precautions made by other members in the community of practice and thereby what is known to be acceptable amongst her and colleagues. Furthermore, the social workers told us that they have no competency to grant financial assistance without the approval of a manager. While this can create some bottlenecks in the case management process, many of them also find it acceptable as it helps avoiding differential treatment and, as previously one social worker put it: 'you shouldn't get something just because you have one caseworker instead of another.' Since almost every decision on action plans involves financial assistance of some kind, they simply cannot be made based on the judgement of one person alone. They have to involve the combined judgements of members of the group and, as we have seen in this example, what is known to be 'good' judgements made in previous cases, helps the problem solver make judgements that agree with the views of others and have been known to work previously.

5.6. Implementation of action plan

The implementation of an action plan is often described by the social workers as a dynamic process. It is expected that the activities will change as the implementation progresses and as new challenges arise and others change character. Expressed in social workers' own words, the many unforeseeable circumstances mean that 'sometimes, you try your way forward with many different types of initiatives, until you find the right one.' As previously mentioned, every precaution must achieve a purpose based on what is found to be challenging a child's development and well-being. For example, during one of the meetings we observed between a social worker and another professional, discussions revolved around the goal of bringing a child

and his mother closer together. This meeting was voluntary and set up by the social worker herself to gain new perspectives on how to approach the problem at hand. One thing that was brought up during the meeting, was the task of finding someone to bring and pick up the child to and from therapy. Various solutions to this problem had been brought up by the social worker and discussed with colleagues prior to this meeting, such as providing the family with a contact person or giving the responsibility to the father, while compensating him for any loss of work. However, as the conversation went on and they got to the core of the problem, their focus shifted towards seeking the opportunity of having the mother's sister drive the child. The reasoning behind this, as they explained, was to pave the way for the mother and child to reconnect and thereby meeting the goal of getting them closer together.

As the above example makes clear, there is no single way of approaching these types of problems. They come with a host of solutions. In finding a solution, the social workers often involve other professionals and the judgement made as part of the implementation of an action plan is therefore considered a collective achievement rather than an individual activity, as it requires different groups working together towards the same goal. Often, the social workers explicitly recognized the influence of others in altering their own behaviour and the way they made sense of a situation and the possible implementation choices. In the discussion of how to bring a mother closer to her child, the meeting with the other professional resulted in the social worker approaching the problem in ways not previously considered and new, shared perspectives were formed as a result of engaging in this meaningful partnership.

5.7. Following up on action plan

In addition to having the freedom to make and re-fine judgements surrounding the implementation process, as well as involving others as part of this process, the social workers are also required to follow certain rules and standards to secure an effective and optimal implementation of an action. Those who follow the 'Styrket Indsats' structure are, as previously mentioned, obligated to work closer with and around a family and child during the implementation process. Among other things, this means that they must evaluate the efforts no later than three weeks after the action plan has been put into practice and hereafter every third month. This is unless it involves an out-of-home placement, which must be followed up after three weeks and hereafter every third week. The following year, follow up has to happen every sixth week. Those who are not a part of 'Styrket Indsats' have to follow up after three months and from that moment every sixth month, regardless of the conditions of the case. Increased guidelines have previously been found to reduce discretion (Cheraghi-Sohi and Calnan 2013) and even though the social workers in 'Styrket Indsats' have fewer cases, they told us that they were just as busy as before. Many of their tasks have doubled up and all the new things they 'have to do' gives them less space to choose their own work process. However, as also found by Larsson and Jacobsson (2013), the space for reasoning when making decisions has not changed with the new

policies. There is always the opportunity that new information and events will occur, which effectively may change the evaluations, goals and actions made in the first place – whatever the original plan proposes (Caspersen and Laustsen 2009, p. 58). No rules can predict the future. One of the social workers described this experience as she reflected on one of her previous cases concerning a young boy whom she decided to move from one placing to another. The boy had been placed in a network foster family (i.e. when a child is placed with relatives) for the past six years and lived with his grandparents. She explained the process of moving the child as follows:

> 'We could see that the boy didn't thrive as he should [...] I talked a lot to the grandparents about how it was too big a task for them, and we tried to support them with respite services, we tried to support them with family therapy and supervision, but it wasn't enough for them and therefore, I made the decision, primarily me really, and went in and said; "well, now enough is enough, now it can't work out any longer." And they were then agreeing with me, and then we moved him (the child) to an actual foster family.'

When asked about the extent to which discretion played a role in making her decision, the social worker told us that it was grounded in her use of discretion. At the moment the decision was made, the child was already living with his grandparents and as the contract with them had not ended, there was no rule influencing her decision. As she explained; 'it's me who decides that what we're doing around the child isn't good enough if we want to make sure he'll have a good youth'. Instead of following the guidelines provided by the law and letting the boy stay with his grandparents, the social worker chose to act proactively by using her discretion as a guideline for what she felt the situation required (Wagenaar 2004, p. 646). In this case, both the decision and the criteria for decision-making was left in the hands of the social worker, giving her large degrees of freedom (Høybye-Mortensen 2014, p. 75). Moreover, her accounts of reasoning reveal the criteria based on which her decision was made, as she explains her focus was on the well-being of the child. In that way, she can be said to be using her discretion to protect and promote the interest of the child whatever that may require. Her efforts are directed to do everything necessary to reach her objective and, as we can see from her story, her efforts begin with this objective, rather than her relying on the terms of the rules – in this case, the ongoing contract with the grandparents. As we mentioned throughout this paper, these decisions are made with the involvement of colleagues, managers, other professionals and, certainly, the grandparents. As emphasised by the social worker, the decision was taken with the agreement of the grandparents and although the process was initiated by the social worker, she could not have made it alone. The social worker's use of discretion is thereby determined not only by the incident but also those involved. In this case, as well as in the others discussed, it allows her to act according to the situation and take individual needs into account, while at the same time being influenced by the broader community morally and ideologically when making judgements, which is the nature of discretion.

6. Discussion and concluding remarks

Based on the analysis, we will now move on to a discussion of our results on discretion and provide our perspective on what might be its role in the future of automation in the public sector and more specifically within social work. Finally, we will present our conclusions and indicate future research directions in this area.

Our main goal in this study was to examine the nature of discretion in social work to debunk myths about discretion that are currently governing and enacting automation of case management in the Danish public sector. We explored social workers' accounts of what constitutes the formal procedures and discretionary practices of decision-making. Based on our findings, we come to the conclusion that discretion is practiced in a variety of ways and for different purposes. First of all, we found discretion to be deeply rooted in the law and internal policies used by the social workers. In some instances, they directly encourage the use of discretion, whereas in other situations they are vague and broadly defined and require interpretation work. Depending on the level of instructions provided by the rules, the discretionary space is either increased with more freedom to skip or simplify elements of casework or decreased with requirements inscribed into the decision-making process. These findings are in accordance with those reported by Vega et al. (2013). In opposition to these findings, however, when discretion is perceived as stemming from misinterpretations or inadequate evaluations of rules, we found that rules rarely provide any right or wrong answers. Regardless of how rules are defined, it is only by putting them into a context that the social workers can make sense of them and translate them into concrete decisions (Wagenaar 2004). In situations where there are no rules to rely on, we found the space for discretion was made bigger as both the decision and the criteria for decision-making are left in the hands of the social workers, making forcing og freeing them to create their own methods and ways of doing things. This result ties in well with previous findings by Redaelli and Carassa (2018). We found that the process of making decisions cannot be reduced to the operation of rules as otherwise claimed by traditional research on discretion, but brought to an end by research in CSCW (e.g. Suchman 1987). By looking at discretion not only in terms of space but also in terms of reasoning, we equally found a correlation between the decision made and those involved in making it as well as who is responsible for using their discretion. Interestingly, this has not been covered in the literature on discretion where it is mainly considered an individual activity and/or investigated as such (e.g. Wallander and Molader 2014; Møller 2016). We argue that this might be due to a lack of exploration of the implicit details of decision-making and its distribution. Deeper analysis reveals the interdependency and teamwork involved in decision-making and based on our findings; discretion is better defined as a collaborative effort. To our knowledge, no research has focused on the collaborative aspects of discretion. As such, we make a conceptual contribution by introducing the notion of collaborative discretion into the discussion.

According to our study, the examination of children (1) is often made individually but the decisions are influenced by different stakeholders. The documentation of their

needs (2) are largely dependent on everyone's own routine, experience and preference due to lack of structure and shared experience. Decisions on precautions or dismissal (3) was found to be a collective activity based on group behaviour and discussions as part of meetings, such as weekly team meetings. Depending on the nature and invasiveness of the precautions, suggestions and decisions in relation to the action plan (4–5) may involve various stakeholders and take into consideration previous decisions made within the community of practice. The process of implementing an action plan (6) is best described as a collective achievement as it requires different groups working together towards the same goal. Finally, the evaluations (7) are rooted in the social workers' use of discretion, which is influenced by the cooperation and negotiations made with various stakeholders.

In addition to viewing discretion as individual choice or judgements, previous literature on discretion tends to view rules as fixed points and as mechanisms used to control discretion (e.g. Bovens and Zouridis 2002; Larsson and Jacobsson 2013; Vega et al. 2013). However, we find that rules are often ill-equipped to deal with the complexities involved in social workers' decision-making since they mainly tell what needs to be addressed and rarely how. As Lipsky (1980) demonstrated, social workers make decisions with room for discretion to interpret and modify formal rules concerning which activities to inspect, which evidence to examine, which inferences to draw and which actions to take (Black 2001). In doing this, they consult and negotiate with various stakeholders in reaching decisions that best serve the circumstances of the individual case and the interests of those involved. Even though the rules may seem clear on the surface, we find that a closer look is necessary to see the complexities. Based on description of some of the inherent complexities involved in decision-making, our findings point to the mistake of over-relying on rules when seeking to understand or intervene the process. Discretion is an indispensable component to the way social workers operate and regardless of how they are defined, the process of making decisions cannot be reduced to the operation of rules. While CSCW literature on collaborative practices and rules in action helps us to make sense of their diversity, multiplicity and (sometimes) vagueness in practice, they do not provide insights on how this relates to discretion. As a consequence, the theoretical approaches tend to become somewhat rigid. For example, Suchman (1987, 2007) denies the specificatory role of formal constructs all together while Schmidt (2011) suggests that we have a rather binary way of consulting them, as either 'maps' or 'scripts'. This has implications for how we view the role of both current and future definitions and automation of laws. To us, it is not a question of determining beforehand, whether or not a legal criterion for decision-making functions best as for example a map or a script, to use the terminology of the CSCW literature. Rather, it is probably more pertinent to allow the users of the system to use it flexibly as a 'map', 'script', or even something in between, depending on the situation.

The understanding we have achieved of discretion throughout this study has not been influential in public debates. Instead, one has embarked upon impractical pursuits for 'automating as much as possible' or 'replacing subjective criteria with

objective'. As alluded to earlier in this paper, the trust in discretion is reduced and by removing it the decision-making process is supposed to become more 'evidence-based' and thus more certain for both the social worker and citizens. We believe this myth may potentially distract us from developing technology that provides real value rather than punitive damages. In order to reverse the situation, the role of discretion must be recognised both by politicians, the public and researchers. While automation might appear to reduce uncertainty, nothing implies that it will solve the complexity of situations. Neither does it mean that decisions are improved or that citizens will get better service (Ponnert and Svensson 2016, p. 595). An example taken from our own fieldwork illustrates this point and highlights the risk of standardised approaches. As part of the child protection examination performed by the social workers, the law is currently asking for their use of discretion in terms of deciding what other matters of relevance must be examined. Should the criteria of this obligation be rephrased with the purpose of enabling automated case management and eliminate discretion? According to Ponnert and Svensson (2016, p. 592) this might result in a somewhat 'digitalised interaction' between social workers and citizens where the social workers get used to manuals and administrative ways of thinking rather than people's stories and experiences. This, in turn, could potentially create uncertainties about what information is needed to provide good care and prevent adverse events. The point here is that, in order for automation to work, uniformity is necessary – meaning that neither assessments nor interventions are adjusted to the individual case. By focusing on relatively static factors, digital-ready legislation ignores case-specific factors. As a consequence, the social workers may risk losing the picture of the actual person and they might find it difficult to match every individual with the information required by the rules (Barfoed and Jacobsson 2012). Social problems are often complex and not easy to define. By simplifying the complexity, it could also give the impression that the causal relationship is clearer than what might be justifiable (Høybye-Mortensen 2014, p. 73). Further, we speculate that it might also hurt the collaborative process.

In their research on 'street-level algorithms', Alkhatib and Bernstein (2019) call attention to the fact that machine learning algorithms may only be able to refine their criteria after a decision is made. They operate on the basis of given data and use existing circumstances to learn (Hagendorff and Wezel 2019) but these do not necessarily reflect current concerns. To us it is obvious that no general rule can apply to every new situation and for good reason, since there is no way to fairly extrapolate the reasoning behind past decisions to all new scenarios (Pasquale 2019, p. 53). As we have seen from the stories we were told by the social workers in the municipality, their work requires discretion in order to be able to adapt to the myriad of individual circumstances. It allows flexibility and sensitivity in dealing with the particular case and the information that might show up during the course of casework. Recall the case where the social worker decided to interrupt the ongoing contract made with the grandparents in order to move the child to a different foster family. Per definition, discretion cannot be automated since then it is no longer discretion. As explicitly or

implicitly suggested by previous research, it may be transferred to other people (Bovens and Zouridis 2002) or replaced by something else (Alkhatib and Bernstein 2019). However, if replaced by something else, it goes against the logic of the situation as discretion serves a specific purpose (Molander 2016, p. 12). As our findings show, each case is as unique as the persons involved and may therefore require a different response. Discretion allows for this to happen. It does not mean that tasks cannot be automated, but the consequences of doing so would, in some cases, be immense. Social workers need to be able to interpret and modify rules in order to, for example, treat children as human beings with personal differences (Biestek 1957), otherwise the risk of creating harm might grow bigger than the opportunity to improve their well-being. This is not difficult to see if we recall the cases in this study and the different responses they required. Further, the current (over)emphasis on rules and automation often leaves the informal aspects of social work under-emphasised (Nyathi 2018, p. 192). While some rule-defined tasks could bring aspects of discretion under control, in other situations it might simply obscure its use (Jorna and Wagenaar 2007).

We are currently living in an age where automation will accelerate and continue to develop for the foreseeable future, but we are far from convinced that it will outshine discretion or make social work easier. It appears that the promises made about automation in the 1970s were in many ways a myth back then as it is now. We find that there are limits both to the ability and the desirability of removing discretion at the expense of automation. Social workers require a model which is much more nuanced and able to respond to situational factors, just like any human beings will. This is something designers of new technologies need to recognize in order to turn their attention from systems that attempt to replace discretion to those that integrate it with technology. We hope that our initial findings will inspire researchers to conduct further empirical studies on the uses of discretion in existing work practices to inspire the design of new technology and to gain more knowledge about its scope and limitations. The CSCW discipline has an important and time-sensitive task to accomplish to ensure an appropriate balance between discretion and digitisation – both for the social workers and certainly also for the citizens whose life are affected by the decisions that are made.

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PUBLICATION 2

'WE WOULD NEVER WRITE THAT DOWN': CLASSIFICATIONS OF UNEMPLOYED AND DATA CHALLENGES FOR AI

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"We Would Never Write That Down": Classifications of Unemployed and Data Challenges for AI

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This paper draws attention to new complexities of deploying artificial intelligence (AI) to sensitive contexts, such as welfare allocation. AI is increasingly used in public administration with the promise of improving decision-making through predictive modelling. To accurately predict, it needs all the agreed criteria used as part of decisions, formal and informal. This paper empirically explores the informal classifications used by caseworkers to make unemployed welfare seekers 'fit' into the formal categories applied in a Danish job centre. Our findings show that these classifications are documentable, and hence traceable to AI. However, to the caseworkers, they are at odds with the stable explanations assumed by any bureaucratic recording system as they involve negotiated and situated judgments of people's character. Thus, for moral reasons, caseworkers find them ill-suited for formal representation and predictive purposes and choose not to write them down. As a result, although classification work is crucial to the job centre's activities, AI is denuded of the real-world (and real work) character of decision-making in this context. This is an important finding for CSCW as it is not only about whether AI can 'do' decision-making in particular contexts, as previous research has argued. This paper shows that problems may also be caused by people's unwillingness to provide data to systems. It is the purpose of this paper to present the empirical results of this research, followed by a discussion of implications for AI-supported practice and research.

CCS Concepts: • **Human-centered computing ~ Collaborative and social computing ~ Empirical studies in collaborative and social computing**

KEYWORDS: Unemployment; Invisible work; Moral reasoning; Data work; Predictions; AI.

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1 INTRODUCTION

> "Internally, we divide 2.3's into *'heavy'* and *'light'*. '*Light'* are those you expect can handle a part-time job [...] or possibly be 'ready to work' if they get the right support. Then there's the other group. If you call it *'heavy'*, it really doesn't sound very nice, but...

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> They are the ones where medical conditions, the citizen's behaviour, and other things point in the direction that it's not very realistic [to get a job]. This is not something I can communicate. They're all categorised as 2.3's."

In job centres in Denmark, caseworkers must categorise unemployed welfare seekers based on their 'readiness' to work. Caseworkers have two categories to choose from: those who are *'ready to work'* and those who are *'ready for activation measures'* needed to become employable. The categories are also legally known as match group '2.2' and '2.3'[1] and are designed to get people off benefits and back into employment [10]. The problem is that, in practice, welfare seekers often do not 'fit' into prescriptive distinctions. Many get stuck in a 'grey area' of the unemployment system where they are not well enough to manage a 'normal' job, but on the other hand, they cannot document a permanent inability to work either. To operate in the grey areas of their work, caseworkers make their own classifications of the individuals they seek to assist. However, for reasons we will demonstrate in this paper, they choose not to record this work - despite it being intrinsic to their activities, enabling them to process cases in practical ways. The caseworkers' classificatory work could be useful as training data for AI systems. However, as the introductory quote clarifies, it remains invisible to the bureaucratic record, and hence AI too.

AI systems are increasingly entering the field of public administration with the promise of improving decision-making [60]. In Denmark's capital region, they are already working to 'assist' caseworkers with predictions about unemployed citizens [24, 76], such as their risk of entering long-term unemployment [35, 62]. To succeed at this task, the systems need to be based on a solid understanding of how decisions about individuals are, in fact, made. Research in CSCW has previously raised concerns about the information available to systems. Informal practices are often excluded from formal representation, and typically only the 'formal' criteria of decision-making are made visible to systems [13, 18, 56, 61]. Thus, technologies are routinely seen as incomplete 'ordering devices' [18]. Through ordering, they enable (and shape) what is made visible and what is not [e.g. 13, 47, 61, 81, 84]. But as they have incomplete information, they order poorly.

At first glance, this makes the appeal of AI systems all the greater, since they can handle complexity and combine different criteria in ways that distinguish them from earlier technologies. This could include factoring in informal classifications. The 'smartness' of AI systems lies not only in their ability to process big amounts of data, beyond the scale of humans [32], as they can process heterogeneous data and identify many patterns within it, scale often being useful but not always a prerequisite. The new possibilities that afford AI are demanding considerable reflection on what this might lead to [36]. In this paper, we argue that it is not just a question of the technicality that matters for success to arise with AI. As Barocas and Selbst [5] point out, *'What a model learns depends on the examples to which it has been exposed'*. Bigger data is not always better data, and larger volumes of data do not always enable diverse patterns to emerge if the data are suspect [20]. However large a dataset, if the data are misrepresentative, or in some other way poor, the outputs of their analysis will be similarly poor [9]. It might even matter that some data are unusable, unavailable, or unrecorded since this will limit what AI systems can learn from. Resulting absences might raise more questions than answers. Data that is processed might also reflect biases in society and can affect classes of people in consistently unfavourable ways [5, 7, 33, 50, 72]. Data is not merely a matter of what machines learn from; it is also a matter of humans who feed machines the data [22].

[1] Match groups has since moved from §2 to §6 in the law text and been renamed to match group '6.2' and '6.3'.

A long time ago, Bowker and Star [18] called attention to the moral decisions involved when creating and maintaining classification systems, many of which end up in computer systems. Up to this day, these concerns have mainly been addressed from the perspective of policymakers [e.g. 36, 51] or system developers [e.g. 1, 15]. A common belief is that decisions about categorisation are no longer made at 'street-level', but undertaken by 'system-level bureaucrats' who fit street-level categories to computer level ones [15]. However, this perspective ignores an intricate interdependence on the street level and how computer-level categories are often dependent on human judgements made by practitioners [79]. The category work used to make data starts at the street-level of, for example, caseworkers. However, concerns about data are rarely addressed from caseworkers' perspective. We have limited knowledge about the work going into producing data and its consequences for the resulting datasets, used by AI systems, remains unknown.

In this paper, we build on previous work on these aspects of classification systems to address new complexities of deploying AI to sensitive contexts, such as welfare allocation. We report on caseworkers' decisions when classifying unemployed citizens on welfare benefits in a Danish job centre. We consider both the information generated by caseworkers and the data made available to AI, as a method for understanding the possibilities and limitations of these systems. Unlike previous studies, we find that the difficulties of implementing AI may not be as reliant on the features of the technology itself; such as the adequacies of training, the labelling of data sets or the depth of machine learning. Instead, as we will demonstrate, problems may also be caused by people's unwillingness to provide data. Studying how caseworkers make these decisions is important and timely as AI may be introduced in the hope of automating and augmenting this work. In either case, how well it might do so deeply depends on the adequacy of the data provided. The questions we seek to answer are: *Why are caseworkers reluctant to record all data on unemployed citizens that they themselves use in their classification work, and what are the implications for AI as a decision-support tool in this context?*

We begin this task by describing the related work reviewed for this study, followed by its setting and methods. We then present our findings and conclude with a reflection of what they mean for the role of AI in welfare services, and elsewhere. For this study, we apply a broad understanding of AI and simply characterise it as processing data for the purposes of pattern analysis. How AI does this or whether the patterns in questions are for welfare provision or some other task is immaterial. Although we fully understand that AI systems can be varied and 'multiple', we want to take their potential seriously by understanding how they may constitute and become constituted in and through caseworkers' practice [22]. Our concern is first and foremost with that of practice, with AI as a consequent of that practice.

2 RELATED WORK

As socio-technical systems of classification, the technicalities of AI are in many ways related to the social history of ordering of various types [22]. In the following, we take on this position as we revisit previous research on classification and how classification systems, with their increasingly predictive power, may contribute to, or intensify, social processes of order and control [23]. We are also interested in how categories matter for individuals, not just things that constrain them. We link studies across CSCW, HCI and STS to address more current concerns about AI in the area of inquiry. Finally, we bring forth new challenges of implementing AI in these and other sensitive decision-making contexts.

2.1 Sorting out and 'making up' people

To classify is part of being human and as previous research shows, we have always sorted people into 'kinds' as a way of navigating spaces and making sense of the world [29, 30, 31, 40, 81]. Classification also works to serve institutional needs. Public organisations, such as job centres, need to classify those they serve to determine their economic support and, pivotal to this, is to make certain individuals 'legible', by which is meant appropriately classified. As noted by Garsten and Jacobsson [40], legibility is crucial, as it allows staff in job centres, namely caseworkers, to verify, control, sanction, reward, follow-up, evaluate, or compare intervention programmes about welfare seekers. This is by no means a neutral process but one informed by organisational priorities and political aspirations and much more besides [40]. Leaving aside their source for the moment; the use of these categories, the process of making individual cases legible, ensures the categories have a continuing life [88]. Administrative categories that make individuals 'legible', reinforce and revitalise the very standards they articulate. What is effectually considered 'normal' is what is 'legible'.

There are, however, different ways of approaching categories and their uses analytically. One way is to look at categories themselves, assuming that categories impose themselves in people. The philosopher of science, Hacking [42], for example, connects the emergence of a statistical society to the idea of 'making up people' in that *"Human beings and human acts come into being hand in hand with our invention of the categories labelling them"*. Classifications, he argues, furthermore 'loop back' as they shape those being classified. They become whom we have defined them to be, which in turn confirms our classification, and leads to further classification. Classifications are sociologically *performative* as they contribute to constituting further actions and expectations of those classified [40, 53]. In this view, to classify is highly consequential for those who are being classified – and especially if they do not fit into universal standards and 'match' the explicit assumptions made about them. As noted by Bourdieu [14] *'assembling in one place a population homogeneous in its dispossession also has the effect of accentuating dispossession'*. Classifications do not only label people. They may also alter future outcomes and determine people's fate [46] or lead them to be thrown around the system [13], discriminated against or left behind.

Another way to analyse category work is to look at how people appropriate categories in their own reasoning. As Douglas [28, 29] reminds us (albeit in a very different context), classifications are to be understood in their context of use by those whose business it is. It is individuals who sort out how local circumstances are seen to match prescribed categories and whether those categories need reformulating. Often, street-level bureaucrats, such as caseworkers [54], function in situations too complex to reduce to prescribed responses. Instead, they use their 'informal' powers of discretion to interpret and modify formal rules before making decisions about intervention of one kind or another [11, 89]. Their decisions are informed not only by bureaucratic rules and standards but also by collective judgements [66] about, for instance, moral standards [49, 59] that underscore the application of categories. These categories are expressed in everyday language and organise how the world is understood in terms of categories.

Sacks [74] also noted how people use categories as 'devices' that link types to doings. For example, the type, 'normal worker', is used to imply things about behaviour. It is not just a person's label (this person is type X) but links the person to kinds of behaviour (i.e., because this person is type X they are likely to do type Y behaviours). Building on these insights about categories in use, Maynard [58] finds that such language practices are intrinsic to organisational life. In law settings, public defenders rely on how certain 'types' of people behave in certain ways.

For example, 'someone very poor' is likely to steal 'an item of necessity' because 'she needed it', and not because 'she was in too much of a hurry to pay for it'. Similarly, Keddell [49] found that in the case of child protection services, social workers often describe parents in terms of mental illness to convey reasons for their 'lack of culpability'. In regards to membership categorisation, this keeps them out of the category 'blameworthy' and maintains them in the category of a 'good' (but struggling) parent. According to Sacks [74], the characteristics used to classify people are not 'natural kinds', simply awaiting 'discovery' [31]. They are reflexively constitutive of everyday life. People use membership categorisation devices to make the world meaningful, classified, and ordered in ways that make sense to them. Hence, Sacks and others in this tradition, look at how people use categories in their particular life situation.

Both the social view of categories and their contextual use, speak to the case of job centres in Denmark. The categories used here can be thought of as social constructs and hence imposing meaning, but how they are used in particular instances also opens up reasoning as a human act in particular places. To categorise someone as 'employable' implies a 'universal' distinction, such as employability and non-employability, but is deployed in reference to a particular person [83]. The analysis and development of technologies that rely on categorical representations, like AI, can be confounded by this distinction, with the categories sometimes giving an 'allure of objectivity and inevitability'. This can make iterating the systems difficult. It can also beg the question about which categories they should articulate [7]. For the same reasons, as we will turn to next, 'classification systems' are often found limited in their capability to capture any 'matter out of place' [29].

2.2 Technologies and incomplete 'ordering devices'

In the context of public administration, divergence from bureaucratic order is typically treated as non-compliance, but, as Garfinkel shows, rules and practice generally have a complex relationship with each other. In Good Organisational Reasons for Bad Clinic Records', Garfinkel [38] famously points to a gap between organisational ordering patterns and what it actually takes to describe practice:

> "The documents' meanings are altered as a function of trying to assemble them into the record of a case [...] Thus an effort to impose a formal rationale on the collection and composition of information has the character of a vacuous exercise because the expressions which the so ordered documents will contain will have to be 'decoded' to discover their real meaning in the light of the interest and interpretation which prevails at the time of their use." [38]

A bureaucratic rule saying something *should* be done may change the produced account of that work, while the work *itself* might remain the same [71]. That is, there may be good reasons to work around formal systems, which is also a central focus of CSCW research. At the core of CSCW is an emphasis on understanding the details of social settings to inform technology design. Studies of 'invisible' work have already proved seminal in amplifying our understanding of professional work and proven useful in giving voice to the performance of tasks that is often left unacknowledged or unnoticed by others [e.g. 16, 18, 56, 57, 61, 84]. For example, Suchman [85] sought to apply Garfinkel to the question of machine manuals (in particular, Xerox photocopiers) and noted how the manuals only made practical sense when used in the right situation. In themselves, such things do not have adequate meaning. They are too abstract. However, as Garfinkel [39] noted, this 'looseness' allows their generalised meaning to be appropriated for

particular contexts. In other words, manuals, like rules, are designed to be interpreted. In Suchman's words, *'the efficiency of plans as representations comes precisely from the fact that they do not represent those practices and circumstances in all of their concrete detail'* [85].

Building on these insights, several studies have examined the problem space between the information made accessible to systems through formal documentation and the broader set of information constituting of the 'know-how' actually used in some situations. Manuals and guides are resources and not descriptions of work, but how they are resources is worthy of investigation. From the work of Suchman [86] and Schmidt and Wagner [75], prescriptive technologies arguably achieve their efficacy not despite, but because of what they leave unspecified. A formal plan's inherent underspecification affords the space of action needed for its realisation [87]. A slightly different argument is put forward by Bowker and Star [18] who refer to classification systems as 'ordering devices' [78] and find that an emphasis on 'order' can ignore the informal and 'invisible' work that has gone into creating and maintaining order. In their view; in practice, every standard is overdetermined and incomplete. Tinkering, repairing, subverting, or circumventing prescriptions of standards are necessary to make them work [52]. From this perspective, categories are not resources to individuals, as Sacks would have it, but things to be 'resisted'.

These two distinct but related views have driven a great deal of research. For example, prior studies have empirically investigated the invisible work involved in making classification schemes 'fit' into local arrangements. Martin et al. [56] find that work requires continuous in-situ decisions and workarounds by operators which, among other things, involve the creation of new categories [56]. These may be valuable and crucial to the actual conduct of the work process – yet they are not visible outside their context of use. In the CSCW community, these categories have become known as 'residual categories' (i.e. 'other', 'nowhere else classified' categories). Residual categories are not represented within any given classification system, yet, classification systems often have to rely on residual categories to render themselves complete [57]. For example, in their analysis of the International Classification of Diseases, Bowker and Star [18] point to the contingencies and contests that went into the classification of viruses and the surprising non-existence of 'old age' as a formal cause of death. Research in hospitals also shows that 'subtle categories' are used to sort out patients with potential cancer [61]. These include phrases and concepts like *'patient lost 20 kg'* or *'weight loss'*. Both create a definition *not* supported by the 'formal' categories, which typically presume that the existence of cancer is 'clear'.

Here, as elsewhere, caseworkers know that multiple factors determine whether a person is processed one way or another, and sometimes only show themselves after extensive inquiry. Uncritical reliance on technology might therefore hide the complexity of real-world (and real work) decision-making [57]. According to Bowker, technologies affect what will, and what will not be made visible [18]. Ultimately, they "*operate through being invisibly exclusionary*" [17]. This, in turn, led many CSCW researchers to attribute issues of visibility to the technologies and conclude that we need to build systems that are better at taking into consideration the informal (and 'invisible' practices), based on the implicit view that systems essentially *shape* what is made visible and what is not [e.g. 13, 47, 61, 81, 84].

While a focus on technological incompleteness has been a useful basis for a considerable body of research to date, they are simultaneously limited by the technologies of the time they were written. In light of recent advances in AI and its growing use in public administration [60], we need new perspectives to understand the challenges involved when implementing AI in sensitive decision-making contexts.

2.3 From expert systems to machine predictions

The interest in CSCW with plans and situated action draws on early discussions with the AI community and a critique of the 'office automation' movement from the 1970s [85]. At this time, computer systems were fundamentally 'dumb' [44]. Information was organised in strict and inflexible hierarchies, and they were incapable of adjusting criteria to real-world (and real work) realities. What mattered practically was not the issue of what words really 'meant', but how they could be defined in formal terms. With recent advances in AI, information can now be organised in more flexible ways. Bits of data can have multiple associations with other data, and categories can change over time [41]. Thus, it is no longer sufficient to say that systems are simply 'incomplete' or unable to support people in doing their tasks, as previous research reports. For instance, residual and subtle categories such as *'old age'* [18] and *'patient lost 20 kg'* [61] may not be formally specified by practitioners, but this does not in itself exclude them from being included in the treatment of a patient. With current AI technology, their meaning may be derived from other patterns in the data and still be considered a cause of death or a sign of cancer. Recent machine learning (ML) trends include unsupervised learning, a type of ML that looks for *previously undetected* patterns in datasets with no pre-existing labels. However, even with more flexible forms of databases, classification and categorisation remain vitally important since there is a premediated order necessary for algorithms to work; information must be formalised so that algorithms can act on it without any regular human intervention or oversight [41].

Attributes like someone's 'real' age may be appropriately formalised and objectified in machinery, but challenges quickly emerge when the existence of stable explanations are taken as given [77]. Additional value may be added in the interaction between people, which could cause problems to computers as they cannot *experience* the world as human beings and the dynamics involved in these contexts [27]. Examples from medical research include the development of ML tools to predict sepsis in patients. Here, the authors found that in practice, there was no standard way of diagnosing the disease. In return, they ask *"What should constitute an explainable algorithm in clinical practice when the definition and underlying pathophysiology of sepsis are incompletely understood in the first place?" [77].* It is significant for technology design that *"if a description is not there, then intentional actions under that description cannot be there either"* [42] and once descriptions are created, they may become difficult to 'unthink' [82]. Transparency of information is not merely a matter of reporting or disclosing information about an already existing description of a person. It also creates the person it seeks to make transparent [36]. Technology, then, becomes a crucial, shaping element in that it helps bring people into being [8]. It may also intensify social processes of classification and control [23]. The design itself is a locus for political action, and through making classifications visible outside their context of use, they can be used politically [68].

Friedman, Bannon and others remind us that there is no such thing as value-free design [3, 4, 37, 63]. Technologies used to support public sector services particularly *"reflect values from the very political context in which they are borne"* [90]. Looking at the public sector and beyond, current AI systems are primarily driven by economic incentives and efficiency ideals, and they are routinely designed to profile people and predict their futures [23, 62, 64, 65, 70]. In these contexts, poor people on public benefits often become the test subjects [33]. Notably, recent findings from a participatory design set up in a job centre show that risk prediction of long-term unemployed did not fit the practices of caseworkers [62]. Instead, caseworkers wanted to shift attention from the individual towards the organisation and use AI to predict waiting time in cases, such as the time it takes to receive medical records on citizens. This finding adds to previous concerns of risk

prediction that focuses on negative outcomes based on negative inputs, which may, in turn, drive negative actions. Instead, Brown and colleagues [21] ask for predictive models to invert risk factors into positive variables, such as the likelihood of not-failure.

Data that are used predictively may also reflect biases in society and negatively affect groups of people [5, 33, 72]. Related work on classification and predictive AI finds this to be deeply problematic. For example, in 'Race After Technology', Benjamin [7] challenges the position that predictive methods are generally beneficial to society. Exemplified through a machine-learning algorithm used to predict crime zones, she addresses racial profiling problems and asks if people in these zones will automatically be perceived as suspicious? [7]. The closer the particular prediction is to broad categories, such as race and gender, the more troubling it seems. It may be even more problematic if the social categories that underlie the training data are externally assigned, and the role of self-knowledge is ignored in the process. This has been the focus of recent critical studies, such as automatic gender recognition, where gender is generally seen as an essentialist binary in which there are two categories [50].

Data is often used by AI tools to draw normative distinctions of people [33] and from this and other examples above, it can be argued that technologies may in some situations become solutions to what are, in reality, social and political problems [6]. When dealing with data-dependent AI that learns from real-word attributes, derived from human activities, about human matters - we must take these and other issues into account. However, as public administrations increasingly embrace AI, these perspectives often get lost in the process, and the work going into producing training data goes unaddressed. Before presenting our empirical findings on this matter, we will first consider the research setting and our study methods in more detail.

3 RESEARCH SETTING

This paper's research setting is a major municipal job centre in the capital region of Denmark looking to experiment with AI to predict, and thus prevent, long-term unemployment of its citizens. The municipality is a known frontrunner in adopting new technology to support decision-making activities and has previously experimented with AI in areas unrelated to unemployment. At the time of conducting our research, the job centre constituted a Head of Employment, administrative staff and four departments handling cases concerning cash benefits: 1) allowance and availability, 2) job and company, 3) job and competencies, and 4) job and resources. Caseworkers within these departments consisted of a small number of trained social workers and a larger group of caseworkers with different backgrounds. These included previous experience as a sales manager, unemployed, graduate etc. All caseworkers attend mandatory courses, but no prior experience in the field is required.

The role of job centres in Denmark is to provide a unitary employment system offering one-stop access to all citizens. Their main task is to establish a quick and efficient match between job seekers and companies [26]. It is a legal responsibility of the caseworkers in job centres to decide whether a person seeking cash benefits can take a full-time job within three months of unemployment. If the answer is yes, the person is placed in a 'ready to work' match group, also legally known as '2.2'. If the person faces challenges beyond unemployment and is found (currently) unable to work, they are considered 'ready for activation measures' and placed in match group '2.3' [10]. Activation measures are designed to get people 'job ready' and may include training courses to assess work capability and skills. Illustrative examples of who may be an 'obvious' fit for match group 2.2 and 2.3 are provided below. Anyone who does not fit into these match groups is considered a 'grey area'.

> Match group 2.2: Anne is a 32-year-old woman who recently graduated with a bachelor's in marketing. Anne is passionate about finding a full-time job where she can use her new skills. However, a lack of professional experience proves it difficult. Anne's caseworker signs her up for an internship as an administrative assistant in the metal industry. At first glance, both Anne and the caseworker are sceptical if it is the 'right fit', but it turns out that the chemistry is good. Anne increasingly develops her skills and as she settles into her new role, the company offered her a full-time job.
>
> Match group 2.3: Carsten is a 50-year-old male recently diagnosed with schizophrenia. Carsten attended ten years of primary school but received no further education and never held a permanent job. He lived for a few years in a high support care home and has struggled with alcohol and hard drugs. Today he is using hash to self-medicate his mental condition. The caseworker finds no reasonable doubt that he is not (yet) ready to take on a full-time job, so there is no need to do a more thorough assessment.

Everyone in match group 2.2 is required to be actively job seeking. The caseworkers told us that in practice, it means that they must submit at least two job applications per week. If failing to do so, the caseworker must sanction the citizen (i.e. stop their payments for some time) to keep control of welfare benefits. According to the caseworkers, and as illustrated in the example above, it is far more challenging to force actions upon or sanction 2.3's. Per definition, they face challenges beyond employment that must be considered. If an applicant is below the age of 30 or fails to meet the requirements for cash benefits, they may be put into one of 12 other match groups as per the Danish law of active job-creation effort. These will not be given further attention in this paper as our research focused exclusively on cases involving match group 2.2 and 2.3, and those who fall somewhere between the two categories (i.e. the *grey area*). We chose these cases in collaboration with the municipality as they are high in number and often complex, thus calling attention to the need for careful examination before considering the introduction of AI.

3.1 AI in the job centre

This study is part of an interdisciplinary research project where caseworkers' decision-making activities are ethnographically examined across Danish municipalities to inform and evaluate the development and use of AI tools for decision-support. When this study occurred, the caseworkers' primary system was a case management system called 'Momentum'. Momentum is developed and maintained as a cloud service by one of the research project's industrial partners. Furthermore, internal project members from computer science concerned with AI development were given access to extract de-identified data for use as part of the research project. Collaboration between internal project members and the job centre was initiated at the project's beginning in 2018, and the goal was to implement the learnings from the research project on an ongoing basis until its completion in 2021, meaning that the caseworkers would be using AI for decision-support on real cases at some point within this timeframe.

When conducting the research for this paper, our fellow project members from computer science were simultaneously doing experimental studies on whether it was possible to predict long-term unemployment on anonymised real cases from the job centre's match group 2.2. and 2.3 citizens. The goal of predicting long-term unemployment was based on a wish expressed by the municipality. A 'good' outcome was defined as employment within a year (as per the law on active job creation efforts [10]) and the idea was to investigate if it was possible to train classifications to predict the risk of a negative outcome (i.e. long-term unemployment). The data

sources used for the initial studies concerned the events that may happen during a case: 1) the laws regulating the process and the domain knowledge of lawyers, 2) the IT systems used for case handling and the domain knowledge of system developers and 3) the workflows carried out by caseworkers and their domain knowledge. The information on the latter was to be obtained directly from our empirical, ethnographically informed practice studies. However, the experiment showed multiple challenges involved in performing such a prediction.

The challenges addressed in this paper was the finding that data was missing to train the models – possibly hindering successful implementation of the new technologies in the future. Key to the early models developed by our project members was the match group history of citizens (i.e., 2.2 and 2.3). Initially, they used law texts and database registrations to gain more information about match groups. Still, it was soon discovered that crucial information was missing on caseworkers' reasoning behind placing or moving citizens in or between match groups. For instance, as the developers told us; the most common registered cause of match group closing was 'other' or 'change to other match group' – which is not indicating much and thus, not very useful for predictive purposes. This became a practical challenge in the labelling of traces and the prediction of long-term employment since the developers, among other things, needed to know if a citizen's case ended with a job.

Based on these insights, the goal of this study was to investigate the criteria used by caseworkers when making decisions, formal and informal, to gain a better understanding of how citizens are moved in and between match groups, how these activities are communicated and thus, how they may (and may not) be supported by AI. Our interests were thereby broader and more far-reaching than those associated with the above AI experiments. It was not our goal to determine neither long-term employment nor whether that was a 'good' or 'useful' prediction to make. We will elaborate further in the methods section below.

4 METHODS

Our study was performed by conducting ethnographically informed field studies [69] with caseworkers handling cases concerning recipients of cash benefits in match group 2.2 or 2.3. The first and second authors visited and revisited the site over seven months between fall 2018 and spring 2019 for a total of four weeks. Together with industrial partners and internal team members from the research project, we participated in training courses on current case management systems and workshops with both caseworkers and developers of AI systems to establish common grounds for intervention. Additionally, the first author observed and interviewed multiple caseworkers, participated in courses, meetings between caseworkers and citizens, and analysed documents outlining organisational structures, policies, and laws.

Observations and interviews were typically structured in two phases. On the first day, we would observe a caseworker in administrative tasks, meetings with citizens, and conversations with colleagues. We would be following them in all of their activities that day, going for walks with them, and having lunch with them. The second day was followed up with further observations and semi-structured interviews with the caseworker lasting approximately 1 to 1.5 hours each. Field notes were written during observations. Interviews were used to interpret the findings from other data sources better and dig deeper into caseworkers' practices. In total, we observed and interviewed seven caseworkers in different age groups, of which five were women, and two were men. Their background included two trained social workers, one teacher, one graduate in political science/economics, one sales manager, one substance abuse counsellor, and one caseworker with previous experience from other job centres. Two of the caseworkers

shared their own experience of having been a part of the welfare system before. Everyone expressed a feeling of being part of an 'unfair' system and wanting to make a difference. We also engaged in conversations with both citizens, managers, and security guards in the job centre. Interviews were audio-recorded and transcribed for structured analysis in NVivo 12 [67].

Data gathering took a relatively unstructured form to begin with and developed into a more structured and strategic form towards the end of the study [43]. This process enabled us to continuously gather, categorise, compare and contrast common themes and significant issues found in the data. Our ongoing interpretation was used to inform the direction of the fieldwork [48]. During the early phases of data collection, we discovered a vital misalignment between the factors going into classifying citizens and the data available to AI developers to generate predictive recommendations. As previously stated, this insight led us to analytically identify the information used as part of this work and what becomes visible or remains invisible to technological tools [81].

Our ethnographic study is inspired by ethnomethodological perspectives [39]. Therefore, the primary attention is on caseworkers' *reasoning practices* - the reasons they offer to explain and describe their classification work [34]. In choosing this as our research focus, we also follow the recommendation by Harper et al. [45] suggesting that *'reasons provide the bedrock of how choices are seen, accounted for and ignored'*. While we attend to AI issues, our main concern is with the pragmatics of classifications that emerged from the observations and interviews with caseworkers. This involves taking a theoretical unmotivated approach to activities and *'looking just to see what people are doing'* [73]. Therefore, it is not our role to decide what things are, what matters, what is important, trivial, or even right or wrong, but to ascertain *how* things are made sense of by those who are doing them [25]. Additionally, in taking an ethnomethodological approach, we also consider AI in how it is 'already embedded' in particular circumstances [22]. At the time of conducting our field studies, all caseworkers in the job centre were familiar with the ongoing AI development and its implementation in practice in the near future and that the goal of our empirical work, ultimately, was to look for implications for design. This also means that AI can be seen as somewhat already introduced to the job centre in how it already occupies caseworkers' minds, making them act and react in specific ways to it [22]. Recognising this helps us understand AI's current role in the job centre and understand the negotiations involved in developing AI tools in these contexts and the possible resistance to these processes.

5 FINDINGS

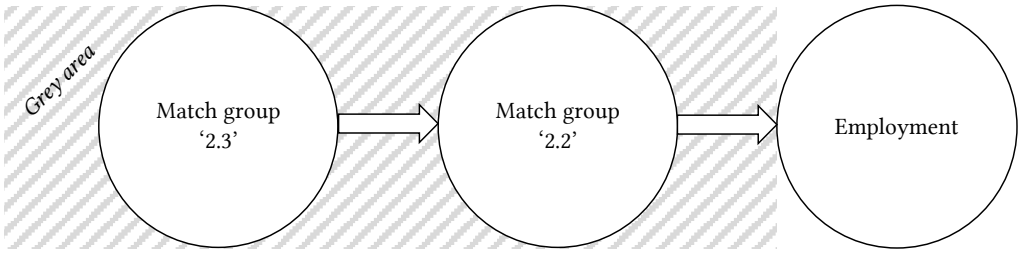
As we move on to present this study's findings, we will first account for the formal aspects of categories used by caseworkers and describe their practical limitations. From this, we will draw attention to the informal classifications created and used by caseworkers to address these practical concerns. Lastly, we will present the reasoning offered by the caseworkers as they decide whether to disclose these data and hence, to make them available to AI for predictive purposes.

5.1 Classifying the unemployed

While the formal task of caseworkers is to help unemployed find jobs and companies finding new employees, in reality, they deal with many people who have been in and out of the system for years, some of which never had a job. Legally, cash benefits are considered temporary assistance and the legal system is designed to get as many off benefits as possible and (back) into work. The evolving nature of these regulations further supports this. Whereas once there were five 'ways' to be unemployed and receive cash benefits, there are now two [55]. More recent

governmental strategies seek to move an additional 20,700 Danish recipients of cash benefits from match group 2.3 towards 2.2 [2]. Caseworkers undertake decisions about placing unemployed citizens into these ever-reducing number of match groups. Their decision-making is based on what one might say are normative models. The models presuppose that any 'normal' person would be willing to work for 'normal' reasons and have an economic incentive to do so. This normative rationale is reflected in the Danish law on active job creation efforts as illustrated in figure 1 below, where not only the goal is to bring everyone on cash benefits closer to employment, but everyone is characterised as being employable, people's motivations are understood as given and the general capacity to being functional is routine. We might say that the law 'encourages' some ways of seeing and being (and 'working') and outlaw others. As previously noted, citizens are legally characterised as either 'ready to work' (match group 2.2) or 'ready for activity measures' (match group 2.3), leaving a grey area between binary designations. A grey area is included in the below figure for illustrative purposes, but with no intent to block out its many shades.

Figure 1: The legal rationale behind match groups for recipients of cash benefits.



Whether it is normative or otherwise, caseworkers need to classify citizens to determine their employability. However, they know a lot is at stake for those who are being classified. Therefore, it is also a big responsibility for the caseworkers to ensure that each citizen is in the 'right' match group. To live up to this responsibility, caseworkers need the appropriate knowledge required to get citizens clarified and processed purposefully - and at the right time. When meeting someone for the first time, and when the need to evaluate past decisions arise, caseworkers have to answer critical questions such as if that person is ready to actively search for a job or participate in activation measures to get them closer to the job market. Technically, this decision can be made by using the legal definitions described earlier. Still, there are only a few options to choose from, and the logic of the binary system often has little to do with reality. As one caseworkers explained:

> "Your only challenge in life is that you don't have a job. That's basically what it means to be 'ready to work'."

Thus, a central problem caseworkers encounter is that the options available in the system are too narrow, and they find themselves struggling to make them work. The caseworkers told us that in practice, most cases are multi-faceted and do not 'fit' into intangible values and one-sided characteristics:

> "We constantly experience [grey areas] as we have to do with people and people cannot be placed into categories […], but you have to do it."

Making decisions about people's rights and duties without having all the information needed can be problematic and fraught with consequences. When people enter the job centre, they often face severe circumstances that have not yet been clarified. As we were told, *"you may have woken up with a depression*". Regardless, every argument for match group 2.3 and against employment needs to be backed up with documentation. This includes medical records describing addictions, mental illness, or other challenges citizens' face, making them unable to work. Retrieving these records can take more time than caseworkers have, and the records may not always be comprehensive enough for their purpose. Other times, citizens themselves may not agree to get an examination in the first place, or they simply fail to show up at the doctor's office. For whatever reason, the caseworkers, as a result, repeatably and often unwillingly find themselves classifying citizens as '2.2's' even though they find citizens unfit and unprepared to meet the demands placed upon them with the category. One caseworker described the challenges of such a case:

> "How can he be [a 2.2]? He hasn't been at work for eight years. A 2.2 is someone we evaluate can return to the job market within three months, and if he hasn't been on the job market for eight years, it has to tell us something's wrong. Then it's us who don't have the correct information. Documentation is missing. I don't know why he's a 2.2. I can't just make him a 2.3."

The caseworker needs only to recognise that the citizen has been unemployed for eight years, to determine the unsuitability of relying on the match group for adequate information. The caseworkers explained that due to cases like these, they think of match groups as something that mainly defines the rights and duties of a citizen. Still, it does not necessarily tell them anything about the person behind or whether they believe he or she belongs to the match group. It says more about the work that needs to be done to accommodate or 'fit' the rules and universal concepts. Similarly, moving citizens from one match group to another does not necessarily mean that a change in the citizen's situation has occurred. Recall that the different 'ways' to be unemployed and receive cash benefits in Denmark were recently reduced and constrained. Indeed, historical and political circumstances play a part in both the creation and maintenance of categories. Furthermore, it is (and has to be) in the management's interest to meet the increasing political demands of getting a higher number of unemployed into labour. Therefore, the desire to move a citizen to match group 2.3 is also made difficult by managerial restrictions. In setting restrictions, at least it 'looks' as if the job centre is working towards that goal.

Being categorised as a '2.3' is arguably preferable to those unable or unwilling to take a job since the match group comes with fewer obligations and less punishment. Besides, where everyone in match group 2.2 must be actively job seeking, 2.3's are, per definition, facing challenges beyond unemployment which must be considered. Then again, one of the caseworkers told us that in practice: *'You have to be almost dead before you can become a 2.3'*. There are several problems associated with this since citizens with challenges beyond unemployment do not become 'ready to work' just because they get a different label attached to them. Instead, and as previously noted, it often means that they get thrown around the system or left behind; not that they end up getting a job. We were informed that those who are 'unfit' for work often complain that they become more ill after signing up for welfare, because of the increased level of pressure that comes with the demands and expectations induced by categories such as '2.2' and '2.3'.

Arguably, the formal categories treat citizens as mere abstractions, with little or no attention to their social and historical context. As we have seen, caseworkers find it too *'difficult to put them into the boxes [the job centre] wants them to fit into.'* This is reflected in their work practices,

where knowledge and insights about citizens are supported with additional information to be meaningful. As we will show next, the match groups cannot (and do not) stand alone. Instead, their meaning is negotiated and contested as part of situated practices and for practical purposes.

5.2 Judging people's character

We found that the formal and institutional match groups serve a useful function in processing cases during our observations and interviews with caseworkers. While the caseworkers recognise the limits and pitfalls of match groups and the predictive purposes they may be used for, they do not abandon them in their internal communication altogether. Instead, we observed that they navigate the formal categories and compensate for their limited information by adding layers of informal knowledge. This takes the form of adjectives which give the nuance to the categories implied in otherwise blunt nouns. To the caseworkers, this is a necessary requisite to distinguish citizens from each other:

> "We have to find our own words or ways to describe the citizens […] because you cannot just say 'a 2.3' and understand what a 2.3 is. A 2.3 can be many different types of people."

By adding to the vocabulary, the caseworkers use their 'informal' powers of discretion to interpret and modify formal rules in ways they believe are necessary to make them actionable. Through language and categorical work, caseworkers make their 'clients' somehow 'fit' the framework. From our observations of internal meetings and caseworkers' daily interactions with colleagues, as well as follow-up interviews, we discovered a common practice of referring to citizens in terms of: *'light'*, *'heavy'*, *'good'*, *'bad'*, *'permanent'*, *'the better'* and *'the best'* 2.2's and 2.3's. Examples include *'heavy 2.2's'* who, according to the caseworkers, are those who do not act like 2.2's - alluding to the legal definition of groups and their long ('heavy') or close ('good' or 'light') distance to match groups and, ultimately, employment. Concerning the *'heavy 2.2's'*, a caseworker described the necessity of classifying this 'type' of people:

> "It's a special match group because it's those who are not suitable for other places. They're a bit in east, west, north and south with their problems."

Caseworkers' classifications mark a clear mismatch between the formal categories and the caseworkers own discretionary judgments about people. These judgements help the caseworkers see the difference between what we might call a view 'from afar' (see: figure 1) and a view 'from within'. The view from within is often based on sensory impressions obtained from frequent and mandatory meetings with citizens. The caseworkers told us that observations of citizens are crucial for obtaining a full understanding of the person behind the 'labels'. This includes phrases such as *"he smells of alcohol"* or *"she gets upset when the conversation turns to her health"*. In making these distinctions, the caseworkers reveal more of people's characteristics and provide a better foundation based on which they can choose the most appropriate actions. As one caseworker explained: *'there are just so many factors to solve, beyond helping them find a job'*.

For instance, those who have been in the system for a long time are also someone who might not get a job, and a 'heavy 2.2' will not get the same treatment as a 'good 2.2'. For a practical example, a caseworker responsible for running a course on 'job skill development' explained that she only invited 'the best 2.3's' as they are more likely to become 2.2's and thus, in a situation where job skills are considered more prevailing. We also learned that in addition to separating those who, for instance, are 'light' from those who are 'heavy', the caseworkers further recognised

the groups of citizens and the teams working with them as different, by distinguishing between different types of 'light' and 'heavy'. Besides helping the caseworkers better define people's distance to the job market and the factors affecting this, this also served as a valuable guideline in the distribution of cases based on caseworkers' preferences and skills. As one caseworker in team *'heavy 2.3's'* described:

> "Each of us has our key competencies. Some are better at handling *'the difficult, mentally ill'*, others are better at handling *'those with an addiction'*, some handle those we call *'the psychopaths'*. It can be *'those who are violently aggressive'*, have *'a violent background'*, those who are *'diagnosed psychopaths.'"*

Membership categories such as 'heavy' and 'addict' create adjectives which, according to the caseworkers, inject necessary nuances into the categorisation work. By combining formal categories with classifications that they feel 'go together', they have a way of keeping certain citizens from being treated as 'ready to work'. If someone is classified as a 'heavy' and 'mentally ill', they may be seen as lacking culpability and therefore maintain a construction as 'good' but 'struggling' person. This, in turn, affects the way caseworkers approach the situation and choose appropriate actions. Recall that everyone in match group 2.2 must apply for a minimum of two jobs per week; otherwise, they must face sanctions. Regardless, and as we have shown, the law is not the only factor influencing how choices are arrived at. Caseworkers are just as concerned with the individual circumstances of the case. A caseworker dealing with 'heavy 2.2's provided us with an example to illustrate this. The case involved a citizen who formally belonged to match group 2.2, but who failed to comply with the legal requirements of job applications:

> "I've had quite a few 'heavy' citizens, in quotation marks. Someone like Lene (name changed for confidentiality) […] Just getting up in the morning, I think, is a big challenge for her […] Lene has to apply for two jobs per week, but I told her; *'instead, apply for two during the next two weeks'*. Because she's not going to apply for four, I'd rather say; *'we'll give you this goodwill, and I understand you, and I hear you and so on'* […] It's a grey area because the law says I can't do that. The law states that you must apply for two jobs a week as a minimum […], but I achieve nothing from contacting [the team responsible for sanctioning citizens] to let them know that Lene hasn't applied for the jobs she was supposed to. If I did that, Lene would have finally snapped. Let's just slowly try a different approach instead, before we start sanctioning this too."

There may be different reasons why someone is considered 'heavy', as the quote above suggests. Every situation requires interpretation through listening and understanding and if someone is already facing a difficult time and at a breaking point, there is no reason to take away their benefits, regardless of what the law says. The law has to be interpreted as it is being applied to concrete contexts. This also implies that caseworkers do not see classifications such as 'difficult' or 'heavy' as inherently negative or positive. Instead, the labels signal that people in groups such as 'heavy' or 'difficult' are there for different reasons. When using the classifications 'heavy 2.3' and 'violently aggressive' in combination, the caseworkers explained how these might also serve to protect themselves when meeting citizens they believe display these personality traits and to make sure these 'types' of cases are distributed to someone who is 'better at handling them' to use the caseworkers' own words. Classifications, then, are used by caseworkers in such a way to form a co-membership with other categories in a situational relevant 'device'. That is to say, the use of particular classifications such as 'heavy' and 'mentally ill' are heard to go together within the

device 'good but struggling' (one suggests the other) whereas violent or aggressive is different. A caseworker explained that if a citizen seems aggressive, it might lead them to think that *'they are just not very likely to get a job'*, but for reasons different than if the citizen were classified in other ways.

What the caseworkers do, essentially, is making it *practical* to categorise citizens. Indeed, there is an economy to this, in that judgements are not endlessly nuanced but sufficiently so to enable caseworkers to 'do their job'. The classifications elaborated with and through the adjectives, are there for practical purposes - getting the individuals in question into the 'formal' system. We may call them 'negotiated terms'. The classifications made by the caseworkers are used throughout casework to help the caseworkers create a better image of the citizens when determining their needs and support, as well as any other measures needed to be taken into consideration to process the case.

Below, we have included a table summarising key characteristics used and reused by caseworkers in combination and collaboration when making sense of citizens and to make the formal categories 'work'. The categories presented in this table are grouped based on the combination of words used by caseworkers to describe citizens. For example, 'good' 2.2's are considered able to work, but within this category, there is a difference between those who want to be employed and those who are deemed lazy or tired. These classifications go together as part of membership categorisation 'devices' where the 'lazy' require a different approach than those who 'want to be employed', but a fundamental commonality exists as they are both considered 'able'.

Table 1: Adjectives used by caseworkers to classify, and make sense of citizens.

#	Adjectives to match groups	Membership categories
1	The 'light' or 'good' 2.2's	Those who can work 225 hours a year, the lazy, the tired, those who want to be employed, those who (try to) cheat, those who have not yet been clarified etc.
2	The 'heavy' or 'bad' 2.2's	Those who don't fit into the match group, those who have been here for long, those who are difficult to help, those who do not want to work, those who smell of alcohol etc.
3	The 'best' 2.2's	Those who are closest to employment, those who have a good chance of getting employed etc.
4	The 'better' 2.2's	Those between the light/good and the best 2.2's, those who might get closer to employment in the future etc.
5	The 'coming' 2.3's	Those who are waiting for the documentation required to become 2.3's etc.
6	The 'best' 2.3's	Those who are closest to becoming 2.2's, those who are willing to work, those who can work etc.
7	The 'heavy' or 'permanent' 2.3's	Those who complain, the difficult, the mentally ill, those with addictions, the psychopaths, those who are violently aggressive, those with a violent background etc.

From the summarised list above, it becomes clear that caseworkers' classifications have a moral dimension as they refer not only to vertical distinctions but also normative hierarchies. As it turns out; it is not so much a question of whether this information is 'informal', but of how caseworkers

define relationships between people and their circumstances. Given that everything is 'good' or 'normal', a person should be able to work. However, the capacity to be 'normal' and fit into the normative models of citizenship is based on presumptions about employability that are often constrained by several other categories. For example, those who have been in the system for a long time may also be someone who will find it difficult to get a job and someone dealing with personal issues may not have the energy to apply for jobs. These relationships are the rich concerns that help caseworkers to inform and constitute decision-making. It renders a visible relationship between values, practical action, and the social organisation of work through caseworkers' language when reasoning about their everyday routine practices and the premises from which they form valid inferences.

Since the classifications are informal, sharing them is also informal and communicated through word-of-mouth, internal meetings, and daily interactions with colleagues. That is, they are 'passed on' to other colleagues as cases are discussed. When working on cases together or when we needed help with a case, the caseworkers told us how the classifications help them to understand the situation at hand better, since, *'a 2.3 can be many different types of people.'* We also found that most of the classifications were often not individually constructed but taken over from others, such as when a case is handed over to a colleague. The caseworkers know what 'types' of 2.2's and 2.3's their colleagues are dealing with. When a case is taken over from a colleague who no longer works in the job centre, there are still ways to retrieve relevant information about the citizen. As one caseworker told us: *"I can look at the profile of the citizen in the system and see a list of his previous caseworkers"*. Thus, the informal sharing of classifications helps ensure the taxonomy is not phased out, even as caseworkers leave or are replaced, which happens quite often.

Nevertheless, as we will turn to in the next section, it is also the informal sharing of classifications that helps keep their flexible nature and give them meaning in use. These dynamics of classifications are crucial to the caseworkers. In their view, the knowledge within classifications is often about human character and personality traits. Although documentable, and hence tractable to various ways of formalising, in its essence, it is judgmental and value-laden. Though these judgements are made with considerable thought and concern, with professional elan and care, caseworkers are morally against any outside scrutiny and feel them ill-suited to any formal representation.

5.3 Moral reasons for keeping information 'off-the-record'

We experienced a 'great divide' between the internalities and externalities of caseworkers' classifications from our observations. The 'invisible' nature of much of what is assumed within their community is intentionally kept invisible to others. The classifications of citizens are intended only for the caseworkers who are members of the 'community of practice' who form, use, and maintain them. The caseworkers explained that they are very leery of providing their evaluations of people to the formal systems or any external stakeholder as they find them difficult to articulate in bureaucratic forms. It is a moral judgement what to write down and what not to write down, and one has to be a competent member of a community to make that judgement:

> "In our team, we use a not so nice language, internally (referring to the adjectives made to match groups), but it's something we would never mention to anyone outside these walls, at all. And that's something we've talked about internally. That it's only us. We don't talk about them with the management consultants and consultants in that way,

> and it's also something we would never mention to anyone else, and we would never write it down."

A related concern they shared with us is that data becomes even more recalcitrant to 'proper understanding' when it is viewed 'from afar', without reference to the real-world character of actual decision-making:

> "We would never write that down. Everything we document the citizen has the right of access to. How would you feel, if you were being talked about as a 'heavy' or 'light' citizen? We have to think about that because the citizen can read everything we write down."

Caseworkers' motivations or motives for not wanting to record and share information outside their community of practice is essential to understanding their practice. Judgement of character cannot - and should not - be summarised in a bullet list, for example. Yet, as we have shown, it is citizens' character traits that caseworkers judge will be key to whether they will succeed in moving away from welfare. This provides both their justification and motive for creating, using, and maintaining the information internally, but, for the reasons provided, they draw a moral boundary along institutional lines between what is right and wrong in terms of recording the information and thus, making it traceable to AI and available for predictive purposes. When asking themselves what information they should make 'public', the caseworkers entertain the thought of what *others* may think of the information when observing it from a distance. For example, *others* may perceive the information differently and only see a person as 'mentally ill'.

To the caseworkers, the meaning of classifications depends on the context. As different people might interpret them differently, they might assimilate an idea different from what was intended and expressed. When caseworkers' classifications get tied down to moments of action, they fulfil particular purposes. Perceptions from afar, from the view of citizens or management consultants, or even system developers, may be quite contrary. From afar, other people can look at these classifications and complain that they should not be in some way. However, they do not know how they are being used in practice. To see the credibility the uses might have, they need to be understood in action and with their particular purpose in mind - at the time and place they are being used. The way classifications are selected, used, combined and configured by caseworkers is oriented to the topic at hand. Their use in any particular situation is purposeful or practical for that topic, rather than abstract references and predictive equations.

Mixed with concerns of understanding the context from afar, the caseworkers also expressed concern about turning classifications into standards by writing them down. They think that classifications, including match groups, tend to have a greater significance for citizens the longer they are used to describe them, based on the assumption that you ought to know more about the citizen. Therefore, citizens do not get informal classifications attached to them 'in a formal sense' and for good reasons:

> "In terms of match groups, I would be, the way I think, I wouldn't like it if we, like, had some subcategories. Let's say; we have someone who's totally 'smart'. And then we have someone who never does what he or she is supposed to do. It quickly becomes a label, I think, because then citizens may have a bad label attached to them for some time, and then change. Because we see this many times, that they change. The behaviour they used to have, it slowly changes, and what you could be afraid of, is that they have that label stuck with them for *too* long [emphasis added]."

The temporality and the idiosyncrasy of the judgement are at stake if written down. Some things the caseworkers allow themselves to think and talk about, but the virtues are not available outside a tightly woven social context. The adjectives become 'dangerous' when formalised as they involve reasoning that carries certain weights for other people as much as for the caseworkers. Once categories become standards, they are given an 'inertia', such that changing them or ignoring them may be difficult and costly, and this type of standardisation enhances the risks. Classifications, such as character judgments, are flexible in nature, and caseworkers are cautious when generalising from one instance to make claims about other places and times. This is exemplified by a caseworker who once handled a case with a citizen that a colleague had previously described as 'aggressive'. But, as she explained to us, she found him to be nothing of that sort and was able to judge him differently. Keeping information 'confidential' thus allows the caseworkers to share, use, reuse, and change sensitive information without the fear that it will end up in the hands of outsiders or as a formal representation.

The caseworkers' fear also pertains directly to their scepticism of introducing AI for predictive purposes. They know AI is supposed to support them in their decision-making activities. They also know the system does not have all the adequate information on how they make decisions. Part of this has to do with information not currently 'fitting' into the system since, as previously mentioned, there are only two match groups to choose from. Furthermore, their unwillingness to formalise classifications is also reinforced in the light of AI. As long as AI does not have the information needed, it cannot purposefully make predictions about citizens, which suits them well. As we have seen, caseworkers believe that data is even more recalcitrant to 'proper understanding' when viewed 'from afar', without reference to the real-world character of actual decision-making. During our observations and interviews, the caseworkers firmly expressed their belief that the imminent introduction of AI techniques is representative of precisely this move. They also worry that it might remove the boundaries in sharing and changing information as it will be accelerated and perpetuated by machines.

The caseworkers know that if they write down their classifications, they might be used by others, in different situations. This also contributes to fear-associated feelings of how that information may be interpreted and used, if known by others. What if citizens get labels stuck on them for 'too' long? The effects of this formalisation are something they are very aware of and cautious about. Therefore, it is not surprising that they also shared their reservations with us about the benefits AI will offer, given that it is implemented for predictive purposes. These reservations are imperative as it is not about whether AI tools can 'do' predictions. It becomes a question about whether the information made available to such tools would be sufficiently comprehensive. Caseworkers' practices make it not so.

6 DISCUSSION

The findings presented in this paper provide implications that are not only relevant to practice studies in CSCW but to all those interested in implementing and evaluating AI-type systems in complex and sensitive decision-making contexts. Our results show that members of work settings make moral judgements about the scope of evidence available to AI. This scope involves data that AI could process, but these members do not find them suited to be 'data-rised' to coin a contemporary phrase. They are ill-suited not just for AI but, as our results show; for any bureaucratic recording system. In this discussion, we relate our findings to previous research and reflect on three implications for AI that emerged as a result. These relate to issues of visibility and predictability and suggestions for future design practices, including the role of AI.

6.1 People in shades of grey

We begin our discussion by considering the nature of classifications and the different shapes they may take. Categories, such as match groups, are often imposed by outside forces but as our findings show, it is through dialogue and interactional work that the task of classifying citizens gets done. Match groups, while defined in legal regulations, are implemented by the caseworkers, and as it turns out, it is in this 'interface zone' that citizens are ultimately defined.

In line with previous research on discretion [11, 66, 89], we found that caseworkers need to interpret and modify formal rules before making decisions about citizens and that they can do so, because of the vagueness of match groups. Following Garfinkel (Suchman [85]), it is their lack of concrete detail that practically makes them useable in this regard. But we must also look to the match groups for important information on how classification 'work'. Caseworkers refer to match groups as revealing nothing about the people within them. Still, they use them in their judgement of people's character. We know that categories are difficult to 'unthink' once they are created, but in a job centre context, they are further backed by government forces. They may, therefore, create particular strong incentives for accommodation [82]. As Douglas rhetorically asks, *"How can we possibly think of ourselves in society except by using the classifications established in our institutions?'* [30]. Although recognising the limits and pitfalls of match groups, this explains why caseworkers still use them in their internal communication and compensate for their limited information by adding layers of informal nuances which they feel are necessary to 'do their job'. As we have seen, this knowledge takes the form of classifications, such as 'heavy 2.2', combined with other membership categories, such as 'mentally ill'.

If classifications like 'heavy' and 'mentally ill' become visible to others, previous research finds that it works to reinforce and produce heavy and mentally ill people [42]. The caseworkers' problem is that they know that their descriptions of people are not stable [28, 29]. To know the meaning of classifications is to see to the actual use. When asking themselves what information they should make 'public', the caseworkers ruminate on how other people might interpret things differently and assimilate ideas different from what was intended in a moment of time and use. For example, would a citizen who at some point was labelled 'lazy', automatically be perceived as suspicious or blameworthy if read by an algorithm? When classifying people, the caseworkers know that they are also producing a 'type' of person, such as a 'mentally ill' person. These typifications of people are created, used, and reused, in combination, but people can and *do* change. Keeping information 'confidential' allows the caseworkers not only to use but also change their classifications.

Classifications are there for practical purposes. They are needed to make sense of citizens and are used to legitimise organisational action, but they can become 'dangerous' when used in the wrong context. They may not fit into the stable categories assumed by bureaucracies – and it is these stable ones that are typically used in AI. This finding is often ignored in research on AI, which takes stables explanation as given, and it goes beyond the standard critique of technologies as merely 'incomplete' ordering devices.

6.2 'Bad' predictions for 'good' moral reasons

Crucial to our findings are the caseworkers' reasoning for not providing or disclosing information. We discovered that these are rooted in their moral objections. In many respects, this discovery resonates with Garfinkel's classic work [38] on the complex relationship between organisational action and organisational records. In our case, it shows that information used by caseworkers to classify citizens combines both standards and conscious judgements of people's character and the

latter are not entered into the bureaucratic record since they, for the reasons provided, are unsuited to that form. The records are, as Garfinkel would say, 'bad' for 'good' organisational reasons. Our findings are not simply echoing Garfinkel's though; these findings point to contemporary issues. Our research shows that these professionals, for their own 'moral reasons', choose how AI should function as part of their decision-making activities. They are the ones who are deciding where AI should not assist. This is not because AI cannot make decisions and predictions, as previous research often suggests. It is that the information that such tools would have as a resource may be inadequate – and for 'good reasons'. To the caseworkers, it is the kind of data that only professional workers can act on. They are to do with judgements that only people make about each other: about character, intention, reliability, good faith and the rest. If we believe the caseworkers, judgement of character cannot - and should not - be summarised in a bullet list, for example. To our knowledge, these insights have not previously been reported in the literature.

We know from previous research that a dataset cannot encompass the full complexity of the individual it represents [5]. Our findings show that the caseworkers are indeed aware of this. Hence, of great importance is their concern with the *epistemology* of their knowledge when classifying citizens. Making their descriptions representable and traceable to AI would, as reported in this study, take the classifications out of the human field of accountability and the actual situations in which the decisions they represent are undertaken. The caseworkers fear the role that AI might play in the future, and because of this, they withhold information. In the context of this research, risk predictions of long-term unemployment were defined by the municipality as a problem that AI could solve. However, the caseworkers are sceptical of the idea that anyone or anything ought to predict people's futures. They are sceptical of AI, but also of prior judgements made by themselves and their colleagues. One caseworker exemplified this with the 'aggressive' case, where she was able to reevaluate and judge differently.

For caseworkers, their intermediate judgements should never be seen as either prediction of someone's future or inherent to their character – which is just a roundabout way of predicting futures, if character never changes. Caseworkers believe people can and will change – and changing people's lives is at the very core of their job. Everything from the job centre's official laws, standard procedures and new AI initiative seem to be premised on the idea that caseworkers can and should be predicting people's future employability, except the caseworkers, who take this to be a very contingent task.

6.3 Data visibility and the role of AI

Research in CSCW has long pointed out the limits of technologies in making certain information visible [e.g. 13, 18, 19, 47, 61, 80, 81, 84]. However, if AI can handle complexity and combine criteria in ways that were inconceivable only years ago, how do issues of data and 'visibility' relate to the technologies of today? As was mentioned in the related work section, ML tools can now extract patterns from a vast amount of data, including data with no pre-existing labels. These and other advances change how we might perceive previous issues of, for instance, 'residual' categories. While these might be nowhere else classified [18], their meaning may still be derived from other data patterns and used for predictive purposes. In the context of our research one could argue that, as long as AI developers can detect 'good enough' labels of who is 'really' a 2.2 versus a 2.3, they do not need the intermediate reasoning processes involved in caseworkers' decision-making. Even if caseworkers choose not to write down their classifications, there could be other information from the databases, that can reveal something about 'light' or 'heavy' 2.2's

and 2.3's. For example, our findings show that a person may be considered 'heavy' if they have been off work for many years. We might view this attribute as an objective kind and something that an AI system could extract from other datasets. Yet, our study shows that the decision of who is 'really' a 2.2 or 2.3 is not stable. We do not know if all long-term unemployed are considered heavy, or how or in what way this is deemed relevant by the caseworkers, or citizens, across cases. It is not the kind of objective, attribute-like quality that may be more appropriate to formally represent someone's 'real' age [18] or bodyweight [61].

Related concerns addressed in this paper are with the permanence of classifications. Arguably, there is a risk that caseworkers may unwittingly become reliant on specific classifications if they become part of the training data used for decision-support [7]. In any case, it may be easier to follow the recommendation made by the system than to go against it. Eubanks noted that even when humans are 'in the loop' regarding AI decision-making, they still tend to defer to machine-powered recommendations [33]. Besides, our findings show that caseworkers obtain sensory impressions in their interactions with citizens, like *"he smells of alcohol"*. As also noted by previous research [27], this poses a challenge for any AI type system as they cannot obtain these data unless they are recorded. As a general point, we must consider the difference between the possibilities of making certain aspects of work visible and the desirability of doing so [12]. In any case, information is harder to capture 'accurately' in the wild, leaving questions about what should be measured in the first place [64]. There are no guarantees that informative features to machines will produce explanations that are useful to humans. Along similar lines, Bucher [22] asks *"if the data is not reflecting the world, how can it predict what will happen?"* If we believe the caseworkers, it would be unwise to predict people's future and employment, even if AI is never introduced. This uncovering match those observed in earlier studies where caseworkers wanted to turn predictions of citizens towards inefficiencies within their organisation or change the focus from negative outcomes towards positive ones.

Our findings suggest yet another solution, one that takes focus away from prediction. If we do not think of the goal as predicting the future and replacing caseworker judgements, it opens up a space for alternative possibilities. Predictions are not obvious, or necessary. AI may be used for other purposes and support caseworkers in mundane, but crucial tasks of retrieving, organising and consolidating case records. This could help ensure that cases are processed with the right information and at the right time, which was also an issue raised by the caseworkers in our analysis. At the very least, it should be possible to resist the desire to put prediction instruments into practice, particularly in sensitive contexts such as welfare allocation. As noted by previous work, this is not an easy task but rather a mutual learning process, where caseworkers are invited to influence design decisions [62]. Explaining what professionals do is a necessary step in this direction. It relieves us from the idea that citizens, in contexts such as these, can be judged along 'commensurate' metrics calculated via machine learning [64]. As we have empirically shown in this paper, it is not only a question of the technicality that matters when implementing AI for decision-support but also caseworkers' moral judgements about what data is considered problematic to record.

6.4 Directions for future research

There is still ample room for improvement in determining AI's role in sensitive contexts such as welfare allocation. We hope that we have contributed to a better understanding of street-level bureaucrats' practices and values in this context. Further studies on classification, which takes the citizen's perspective, may also be undertaken. This is particularly relevant in a job centre context,

where welfare seekers mainly get defined by others. From previous research and our experience in the job centre, we know that caseworkers' phrases to describe citizens might not always be the same as citizens would use to describe themselves. We also know that it may lead to new problems if the role of self-knowledge is ignored in the process. While this is beyond this research's scope, we believe this is an equally important issue to investigate as part of future research.

7 CONCLUSIONS

Based on ethnographic field studies of classification work and its implications for AI in a Danish job centre, this paper shows how caseworkers categorise citizens by adding informal classifications to the binary vocabulary offered by their municipal job centre. The classifications are made on negotiated and situated judgments of people's character that allow caseworkers to operate within a formal framework - yet with sufficient looseness to properly process each individual case and to do so in ways that other caseworkers understand and can act on. While these judgements have an intersubjective character, caseworkers choose not to write them down. Their reasoning is rooted in moral concerns about perceptions of information once it becomes documented and thus viewable away from its context of use. According to the caseworkers, the meaning of classifications depends on the context of use and documenting can thereby lose the real-world character of actual decision-making. In continuation of this, they express deep concern about how information might be interpreted and perpetuated when stored by algorithms and 'stick' with people for too long. For these reasons, while documentable and traceable to AI, the official records are left without a fundamental understanding of how decisions are actually made. This study contributes to CSCW and HCI research in sensitive contexts, such as welfare allocation, by offering empirical evidence for this and by showing that the problem of implementing AI might not only be to do with the technology itself, as previous research suggests, but also human questions about what data is (and should be) made available for AI.

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PUBLICATION 3

MODELLING A PROCESS THAT *"DOESN'T REALLY EXIST"*: CO-DESIGNING AI WITH STREET-LEVEL BUREAUCRATS

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Modelling a Process that *"Doesn't Really Exist"*: Co-Designing AI with Street-level Bureaucrats

Abstract. In the public sector, laws, policies, and other standards increasingly move through advanced technologies to influence decisions on the frontline, making it harder and harder for 'street-level bureaucrats', such as social workers, to challenge how services are approached and delivered. CSCW research has long demonstrated that digital technologies create an idealised world but are often unable to support the messy, negotiated realities they encounter in practice. Similarly, it is well known that 'street-level bureaucrats', such as social workers, use discretion to implement policies in accordance with the circumstances of each case. However, little is known about the discretionary values of street-level bureaucrats when designing technologies. Using data from three years of ethnographic fieldwork in a Danish municipality, this paper offers empirical insights into the assumptions brought into the design of an AI-based case management system and the changes that take place when these assumptions meet the lived realities of social workers. Despite what the project had initially believed, it turned out that social workers are not interested in finding different ways of reaching a predefined goal. When assessing each case, social workers take a flexible approach and exercise discretion rather than attempt to influence fixed outcomes. The primary contribution of this paper to CSCW research is this examination of discretionary values of street-level bureaucrats as part of a design process, with the focus shifting from ways of bringing about a particular outcome to the processes that produce it. This paper, then, questions the extent to which an understanding of laws, policies, and other standards also translates into an understanding of the practices they are intended to support.

Keywords: Public sector digitisation, Street-level bureaucracy, Discretion, Participatory design, Values in design

1. Introduction

The public sector has long relied on digitisation to improve public services. Technological advances in automation and Artificial Intelligence (AI) mean that increasing amounts of work that used to belong to street-level bureaucrats[1] are now being supported by or replaced by machines. It is often believed that these technologies can do the same work as humans, but only better and faster (Winthereik, 2020). In Denmark, the government sets the bar high for public digitisation and is moving rapidly to exploit the potential of automation and AI (Agency for Digitisation, 2018a; Ministry of Finance, 2019). However, in areas such as child services, current laws are seen as an obstacle for desired changed. They are often vague and broadly defined, and while they may describe *what* social workers need to do, they often require discretionary judgements by skilled professionals when enacted in practice (Petersen et al., 2020). Thus, the aim of 'digital-ready legislation' is to minimise discretion to enhance the opportunity for automation and AI to be successful. Intertwined with this, is an ambition of using data as a key driver to improve the efficiency of standardised workflows (Agency for Digitisation, 2018b). Increased reliance on legal rules and data further increases the challenge for street-level bureaucrats and citizens to contest or correct 'data-born' accounts of a situation (Møller et al., 2019). In this way, public digitisation can significantly change the way services are viewed, approached and delivered. It also implies that decisions about what to digitise and

[1] In his seminal work on street-level bureaucracy, Lipsky (1980) defines 'street-level bureaucrats' as *"public service workers who interact directly with citizens in the course of their jobs, and who have substantial discretion in the execution of their work*".

what not to digitise, involve assumptions about the nature of work itself. However, as noted by Møller et al. (2020), what is *not* clear is how to involve the perspectives of those whose work is subject to change.

CSCW researchers share a strong commitment to ground the design of technology in a detailed understanding of the work practice (Schmidt and Bannon, 2013) and has long embarked on the problematic relationship between plans and situated action. Previous findings show that plans vary according to the situation, and where a standard operating procedure does not 'fit', a plan may serve in the interest of *what* things should come to, but not *how* they should arrive there (Suchman, 1987; Schmidt, 1997). In the context of public administration, policymakers might expect implementation to be a top-down process. However, a different picture often emerges through the implementation practices of street-level bureaucrats (Boulus-Rødje, 2018; Høybye-Mortensen and Ejbye-Ernst, 2018; Petersen et al., 2020). Research has long shown differences between the 'idealised' world that technologies were meant to create and the messy, negotiated realities they encounter in practice. For example, Lipsky (1980) argue that street-level bureaucrats, such as social workers, implement policy according to their own values, priorities and the local challenges they encounter. Studies on algorithmic systems continue these well-established discussions. Recently, terms like *'street-level algorithms'* and *'digital discretion'* have become commonplace in CSCW research, referring to discretion as increasingly augmented or automated by emerging technologies (Busch and Henriksen, 2018; Alkhatib and Bernstein, 2019). Against this backdrop, CSCW scholars call for a renewed focus on the active engagement of street-level bureaucrats in design and for their values to be incorporated throughout the development of algorithms (Bannon, 2011; Møller et al., 2020; Saxena et al., 2020).

This paper adds to previous work on the incongruence between plans and action in street-level bureaucracies by examining the discretionary values of street-level bureaucrats as part of a participatory design setup. In contrast to previous studies that mainly focus on what it means to 'follow a plan' (Suchman, 1987; Schmidt, 1997), this paper brings attention to the process of 'making a plan'. More specifically, I provide empirical insight into the assumptions brought into a design process organised by a Danish municipality and what happens when they meet the lived realities of citizens and social workers, as they become involved as experts of their own experiences of child service cases. Their own articulation of discretion is part of this and is seen as particularly important since, in this context, cases are characterised by high complexity and uncertainty, and the outcome of decisions can have a significant impact on people's lives (Petersen et al., 2020).

Going into the municipal design project, the idea was that a case process includes steps beyond the law and that these could be discovered by grounding design in practice and involving users in design. Instead, the perspectives of users challenge the whole idea of a process. My findings show that not only did the process look different to them. The social workers questioned whether the process existed at all. Then, there was no point in merely thinking of different ways to reach an end goal (Suchman, 1987; Schmidt, 1997). Instead, the insights triggered a re-evaluation of the entire process to be designed. To examine how discretionary values may be incorporated into design processes, this paper reviews existing work on 'street-level discretion', combining it with CSCW research on co-design and values in design. After providing this background, I describe the components of the design process that

are empirically examined in this paper. The background presentation serves as the launching pad for the presentation of case descriptions, methods, and the findings of the study. In conclusion, I discuss how my findings contribute to CSCW research based on the difficult but crucial question:

> *How do we design a process with social workers if they do not believe that the process exist?*

2. Related work

2.1 Perspectives on street-level discretion

Discretion has re-emerged as an area of study with the increasing use of advanced technology in the public sector. Discretion is broadly conceived as the exercise of judgement and the freedom to act within controlled limits (Evans and Hupe, 2020), and is generally seen in terms of the impact of technology on the opportunity to act flexibly. Within this context, discretion has been studied from various perspectives and often with different and conflicting results. In the public administration and literature, discretion is often linked to legal approaches, which consider its operation within or outside the boundaries of rules. As such, 'non granted' discretion is seen as a threat to the legal order, which should be constrained by 'filling gaps' in statutory standards and using legal control instruments (Mascini, 2020). However, according to Lipsky's (1980) famous account of 'street-level bureaucracies', managers and front line workers have different priorities, values and commitments (Hoyle, 2014). For Lipsky, discretion occurs in a context of conflict between top-down and bottom-up approaches. He emphasises the active role of street-level bureaucrats as the 'human face' in the implementation of public policy and argues how they, in effect, function as policymakers as they respond to the needs that arise in practice.

In Lipsky's account of street-level bureaucracies, he also sees managers as best placed as the key regulators of discretion based on the view that they manage it in the organisation's interest while the role of street-level bureaucrats is more self-interested (Evans, 2010). Along these lines, a common assumption in the literature is that technology works to restrict further the discretionary freedom of street-level bureaucrats (Keymolen and Broeders, 2011) or make it redundant, as human judgements are no longer made at 'street-level', but undertaken by system developers during design (Zouridis et al., 2020). Recently, terms such *'street-level algorithms'* entered the HCI and CSCW vocabulary to express the inability of inflexible algorithms to adapt to situational demands (Alkhatib and Bernstein, 2019). Following previous CSCW calls for more reflexivity in technology (Blomberg and Karasti, 2013), subsequent research ask future algorithms to keep the human-in-the-loop when the need for discretion arise (Binns, 2020; Saxena et al., 2020). Others find that, even in fully automated processes, discretion still persists where uncertainty about the operation of an algorithm exists (Pääkkönen et al., 2020).

Research in CSCW has long embarked on the problematic relationship between plans and the contingencies in practice. Previous findings show that plans vary according to the situation, and where a standard operating procedure does not 'fit', a plan may serve in the interest of *what* things should come to, but not *how* they should arrive there (Suchman, 1987; Schmidt,

1997). Due to the strong reliance on ethnographic workplace studies in CSCW, many workarounds (Grudin, 1988; Bowers et al., 1995) and invisible practices (Strauss, 1988; Suchman, 1995) have been documented as they have emerged complex in real-life settings (Mørck et al., 2018). Similar to these findings, other researchers have provided new perspectives on discretion by relating it to a broader set of circumstances that enables practitioners to exercise judgement about what is needed to achieve a goal or task. These studies argue that technology extends discretion, as it cannot capture the informal decisions or 'coping strategies' used by street-level bureaucrats when the system does not fit (Jorna and Wagenaar, 2007; Dolata et al., 2020). For example, findings from a welfare context show that technology mainly works to support compliance with policies while providing limited support to the knowledge practice of caseworkers (Boulus-Rødje, 2018). As argued by Pasquale (2019) automation can elide or exclude critical human values and necessary improvisations that depend on communication between people that is not reducible to software, such as during face-to-face meetings. However, prompted by the rise of automation and AI, scholars increasingly insist that it makes more and more sense to refer to discretion as *"digital discretion"* since an increasing number of street-level bureaucrats operate computers instead of interacting face-to-face with their clients (Busch and Henriksen, 2018; Bullock, 2019; Ranerup and Henriksen, 2020).

The review of previous research on discretion shows that researchers disagree on discretion's nature and influences. However, it is also noteworthy that a commonality exists between the different strains of research in that discretion is viewed through the lens of *the freedom enjoyed by street-level bureaucrats to alter pre-defined prescriptions in response to individual cases*. In other words, the discretionary freedom of street-level bureaucrats, such as social workers, does not exist except on "the street" and as part of a concrete case. Evans and Hupes (2020) noted that the dominance of particular perspectives on discretion risk crowding out others; assuming certain problems to be the right ones to be solved and requiring a specific approach. Still, previous literature rarely challenges the assumptions which underpins much of the traditional work. Consequently, we know surprisingly little about the role of street-level bureaucrats, and their discretionary values, during the design of policies and embedded technologies (Petersen et al., 2021). This is where values are exposed and negotiated in search of solutions that, in turn, affect the adoption, use and impact of the particular technology.

2.1 From street-level implementation to design

The well-documented tension between public policies (and technologies) on the one hand and the lived realities of street-level bureaucrats on the other hand; raises questions of how we can improve design for better real-world scenarios (Boulus-Rødje, 2019). Despite the focus in CSCW on grounding design in the everyday world, we are still in the early phases of designing algorithms for public services. Usually missing during the design and development of these technologies is a critical reflection upon the inscription of values. As we have seen, there is extensive literature concerned with the values of street-level bureaucrats as they implement policies and deploy technologies in practice. However, research in this area finds that the values of street-level bureaucrats, such as their autonomy when making decisions, is often excluded from design decisions (Palacin et al., 2020; Saxena et al., 2020). In Denmark, several studies

have examined value positions in national strategies and technology design and, more recently, in the case of automated decision-making making in social services (Rose et al., 2015; Persson et al., 2017; Ranerup and Henriksen, 2019). These studies all find legal compliance, service quality and workflow efficiency to be the most pervasive value positions from the perspective of managers and politicians. However, these studies also build on pre-defined values and consider only the perspective of politicians and managers. As noted by Arildsen (2019), we are yet to discuss whether these are the 'right' values.

CSCW research has long reminded us of the partial views held by different stakeholders, and in particular, that the voices of users are regularly silenced (Suchman, 1995; Randall et al., 2007). It is thus the aim of CSCW, and especially Participatory Design, to involve users and incorporate their values throughout the design process (Wagner, 2018). The design process is a crucial phase for fostering value alignment between stakeholders (Paanakker, 2020) and multiple perspectives are increasingly emphasised as critical to success (Blomberg and Karasti, 2012; Baumer, 2017; Khovanskaya et al., 2017). Recently, findings from a participatory design workshop revealed that when asked to describe where algorithmic decision-support systems could be valuable, caseworkers in public services had a different notion of value than those outlined by the municipality. The municipality expected to focus on profiling individual citizens, but the caseworkers pushed for systems that could help clarify case processes (Møller et al., 2020). Research also shows that even in cases where values are shared between stakeholders, their logics might still conflict. Different stakeholders might value different things or assign a different value to the same thing based on their perspective (Voida et al., 2014). For example, they might not have the same assumptions and views about the best practices for helping citizens (Boulus-Rødje, 2019). In the same direction, CSCW scholars ask for a better understanding of the values of street-level bureaucrats and the lived experiences of the citizens as part of the design of policies and technologies (Boulus-Rødje, 2019; Møller et al., 2020; Petersen et al., 2020; Petersen et al., 2021). This is becoming even more crucial since laws, policies, and other standards move through increasingly advanced technologies that often alter the decisions made by street-level bureaucrats or make them on their behalf.

In this paper, I build on previous understandings of street-level practice and values in design, by contributing with new empirical insights on what happens when social workers become involved as part of a design process. As a result, I also broaden the concept of discretion so it no longer refers only to specific cases 'on the street', but also to *design* and *future-making processes*. Below, I provide some necessary information about the study's context before presenting my empirical findings to support my argument.

4. Background: EcoKnow and DCR Graphs

This study is part of a large, interdisciplinary research project called EcoKnow (Effective, co-created, and compliant adaptive case management for knowledge workers'). The research project was kicked off in autumn 2017 with the following vision:

> "The vision of EcoKnow is to create value both for the society and the participating partners by developing world-leading solutions for the effective digitalisation of knowledge work processes that empower caseworkers and citizens to plan evidence-

based optimal process flows for the individual case while guaranteeing both efficiency and compliance with the law."

The problem that drove the research project from its beginning was defined as constantly changing regulations in the Danish public sector on the one hand and the rigidity and inflexibility of technological systems on the other hand. A central hypothesis was that "DCR Graphs" (Dynamic Condition Response Graphs) could serve as the backbone for the vision. Described in further details below, DCR Graphs was defined as a 'workflow GPS'. The company behind DCR Graphs provide further details on the GPS analogy *"No matter which route or shortcut users end up choosing, they are always guided to their final destination according to the rules – just like with a GPS"*[2]. As such, in the EcoKnow project, DCR Graphs would describe the rules governing the execution of a process, but without determining *how social workers should do their work* or *how it should proceed* (Hildebrandt et al., 2020), as we otherwise know it from more traditional 'check-list' type systems.

During the lifetime of the EcoKnow project (2017-2021), other research projects and commercial companies were competing to offer their services, mainly by focusing on new capabilities of algorithms to work with large datasets for profiling and risk prediction purposes. (Schultz, 2018; Lund, 2019). These solutions, while they continue to expand and grow (Hansen, 2018) have also been criticised for being ideological and deterministic (Petersen et al., 2021) and for relying too heavily on the designer while failing to give users 'a say' in the process (Møller et al., 2020). Against this backdrop, the EcoKnow project intended to integrate ethnographic methods into design to ensure a voice for the social workers and citizens on the project. Unlike other available solutions, the nature of technological support was an open question to be empirically investigated for the research settings. EcoKnow also distinguished itself from many other bureaucratic processes by involving users as co-designers of their own process.

The EcoKnow project consists of three-stage cycles. From 2017 to 2021, four work packages (WPs) collaborated in various ways to achieve the project's goals. The overall approach in the municipal setting examined for this paper was to iteratively design, develop and test the new 'workflow GPS' based on data and process mining (WP2) and rule-based modelling of law texts (WP3), and informed by the insights from the ethnographic fieldwork (WP1) and understandability studies (WP4). My role as an ethnographic researcher in WP1 was to contribute insights into work practices and design recommendations before, during, and after implementing the new technologies. The EcoKnow project involved two municipalities: one family department handling child service cases and one job centre handling unemployment cases. This paper focuses specifically on the family department, and pays special attention to their use of DCR Graphs, as detailed below.

4.1. DCR Graphs: Just like a 'GPS'

DCR Graphs is a process engine developed over the last decade in a collaboration between research groups and industrial partners in Denmark and managed as open-source by the

[2] https://www.youtube.com/watch?v=DCHcQH6R9Nw

company 'DCR Solutions'[3]. The principle behind DCR graphs is to allow for a *relation based* approach to process modelling in the form of 'graphs'. A graph is a model that consists of a set of activities and their relation to each other (Christensen and Hildebrandt, 2017). Each graph can be imported into a case management system to support social workers in executing activities in the shape of a task list or as automated events (Hildebrandt et al., 2020). There are five types of relations available to the graph modeller, as shown in figure 2. These will be described in further details as part of figure 3 below.

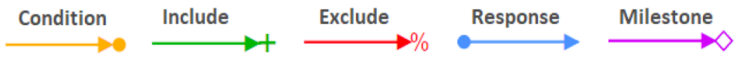

Figure 1: The five relations used in DCR graphs

An activity in DCR graphs can also be assigned a number of *roles*. This means that an actor having one of the assigned roles can execute the activity. In the case of child services, the case process would include three main roles: *social worker*, *manager* and *robot*. The role *robot* is used for activities to be carried out automatically. Below, I illustrate the use of DCR Graphs with an example of a 'simple graph', developed before the ethnographic studies and based on a legal process defined as 'loss of earnings'. This process was also chosen as a case for the initial development of DCR Graphs, as described in more details in the next section.

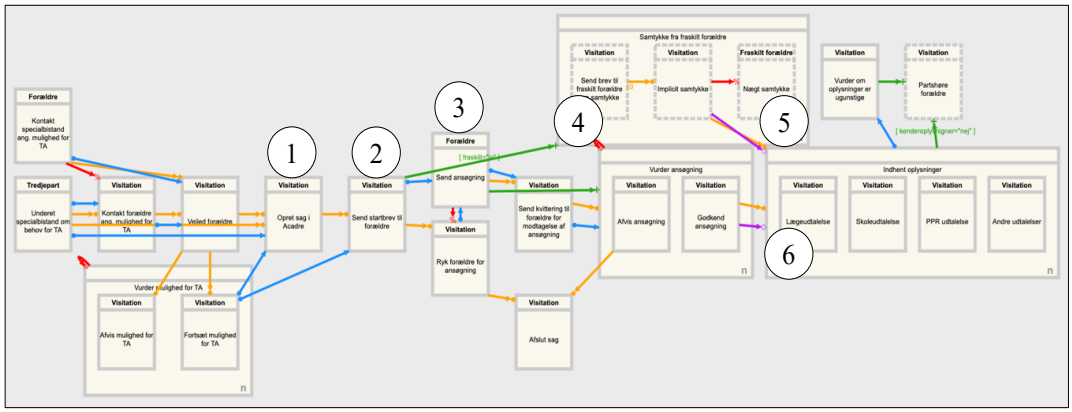

Figure 2: DCR graph based on §42 in the Danish Law on Social Services

In the figure above, the DCR graph shows a process for 'loss of earnings' with a set of *activities*, *relations* and *roles*. While the graph is in Danish, an example is provided to describe its meaning in English. From the activity marked **(1)**, we see that it is the social worker's role (in this case, those responsible for preadmission cases, or 'visitation') to create a case in the municipality's document management system 'Acadre'. The *condition* to the nearest left ensures that an activity B cannot be executed before A is executed at least once. This example indicates that the case cannot be created if the social worker has not already given the necessary

[3] https://dcrsolutions.net/

instructions to the parents. In this context, the instructions include information on the conditions when receiving 'loss of earnings' when caring for a child at home, as a necessary consequence of an impaired physical or mental function (as per §42 in the Danish Law on Social Services). The *response* relation **(2)** from an activity A to B is where the state of B is set to pending when A is executed. This example informs the social worker that when a 'start letter' has been sent to the parents, the parents **(3)** can hereafter send their application to receive 'loss of earnings'. As seen in the green arrow pointing from **(2)** to **(4)**, the execution of the activity 'start letter' also executes the activity of getting 'consent' ('samtykke') from divorced parents. However, in this case, that is only if the parents are divorced, hence the condition [divorced="yes"] ([fraskilt="ja"]). The same goes for *excluded* activities, as illustrated in **(5)**, where divorced parents cannot 'refuse consent' ('nægt samtykke') if they have already given it as part of the activity to its near left. *Exclude* (resp. *include*) from an activity A to activity B means that B gets excluded (resp. included) if A is executed. Last but not least, the *milestone* pointing from **(5)** to **(6)** shows that consent is a milestone that must be executed if pending before the social worker can collect information ('indhent oplysninger') **(6)** relevant for the particular case. **(6).** Thus, the *milestone* relation means that B cannot be executed as long as A is pending.

With DCR Graphs, any user with modelling rights can customise the graphs on the back-end according to local needs. This also allows social workers to continuously adapt the system to fit their practice. Activities can be deleted and added dynamically, their relations can be re-defined, and their roles can be re-assigned or removed. While *activities*, *relations,* and *roles* provide the foundation of DCR graphs and what is needed to 'map' a process, its AI capabilities mainly come from collecting data on previous workflows and using these to identify patterns and provide recommendations on next steps. This is defined in the EcoKnow project plan as: *"When we enter a target (our goal for a specific process), Google maps can suggest a legal route also taking into account the traffic in the past, which corresponds to the use of process mining of past case logs to suggest a case plan.".* This is also described as the role of WP2 in the previous section, where machine learning was used to 'learn' which processes could be the basis for data in so-called 'event logs'. Furthermore, our colleagues in WP3 was responsible for developing a tool to highlight law texts to be used as part of DCR Graphs to automatically update all rule-based activities once changes occur to the law. DCR Graphs itself is known as 'symbolic AI'. Therefore, the type of recommendations given by DCR Graphs is based on rules or activities that can be *explained*. For example, the system can recommend a social worker to collect information from a child's school after they receive an application for 'loss of earnings'.

5. Case and methods: 'Loss of earnings' in child services

This paper is based upon three years of ethnographic studies (2017-2019), which took place in a Danish municipality's family department, responsible for helping children and families with needs for support. The municipality is known as a frontrunner in public digitisation and had previously experimented with digitised services in areas unrelated to child services. At the time of conducting this research, the municipality did not have a case management system in place,

and the goal was to integrate DCR Graphs as a support tool across all services, starting with one process at a time. Soon after my ethnographic field studies in the municipality began in late 2017, it was decided during a meeting between the municipality and the EcoKnow project to begin developing DCR Graphs based on a legal process known as *"Loss of Earnings"*. The legal process is described in §42 of the Danish Law on Social Services based on its outcome:

> "The municipal council shall pay compensation for loss of earnings to persons maintaining a child under 18 in the home whose physical or mental function is substantially and permanently impaired, or who is suffering from a serious, chronic or long-term illness. Compensation shall be subject to the condition that the child is cared for at home as a necessary consequence of the impaired function."

Before the meeting took place, our colleagues from computer science (WP2) had already attempted to understand the legal process and make it available for formal modelling in DCR Graphs. Following this, the municipality ran a case study in 2018 called 'loss of earnings'. As noted by one of the municipal employees:

> "Focus on our part was to produce this graph for loss of earnings, partly based on the social workers' experiences and based on the citizen's experiences of going through the process."

Going into the project, the idea from the municipality was that the process for 'loss of earnings' includes steps that go beyond the law and that these can be modelled based on insights obtained from participants. The goal was to use these insights to optimise the process for 'loss of earnings', as part of future cases. From a design perspective, the interest was on the 'route' leading to decisions about 'loss of earnings', and the GPS analogy was used to build an initial understanding of the process based on its legal outcome. Before starting the project, I agreed that I would join as a member of the municipality's project team (consisting of one digitisation consultant and one administrative worker who was also the developer of DCR Graphs) and engage in activities of seeing the project through. This involved participation in internal brainstorm session, follow up meetings and interviews and workshops with participants. My role as a researcher in this context was to act as a *participant observer*, meaning that I contributed with inputs, while my research objectives were known to the project team and the participants. It also meant that decisions on whom to interview and invite for workshops was made by the municipality – who also held the primary role as interviewees and facilitators during workshops.

Previously, as part of my fieldwork in the municipality in 2017, I had already become aware of the dangers of relying too heavily on the law to determine the process of 'doing' casework. My findings (reference anonymised for review) showed that casework is always informed by the individual case and situation at hand. In the context of child services, laws are often broad and vaguely defined and require autonomy to make discretionary evaluations. Building on previous work in CSCW on plans and situated action (Suchman, 1987), I found that laws often define *what* the social workers must do, but they do not explain *how to* go about it in practical terms (reference anonymised for review). These findings were taken into consideration by the

EcoKnow project, who later communicated the need to consider discretion in design, but based on the assumption that the outcome ('loss of earnings') remain the same:

> "For example, in some situations, it may be professional discretion that determines where information is to obtained from, in the case of loss of earnings, but it is a routine task to obtain the information […] In other situations (depending on the nature of the case), information retrieval may be very routine."

My research interest in the complex relationship between rules and practice, and the value assigned to discretion by different collaborators in the project, led me to pay special attention to the assumptions built into the design process - while being determined to give social workers a say in the process. For the same reason, this paper focuses explicitly on the 'loss of earnings' case study and my experiences of being involved in the design process. I specifically draw on interviews with social workers and citizens (to understand their current process for 'loss of earnings'), and a participatory design workshop with social workers (to optimise the process for 'loss of earnings'), while all three years of ethnographic fieldwork provide the context.

For this case study, we (the project team of three) interviewed six participants, of whom three were social workers, and three were citizens. For the participatory design workshop, we invited a total of seven social workers, three of whom we had interviewed earlier. This lead to a total of ten participants[4]. Social workers were selected based on two criteria. First, they needed to have experience working on 'loss of earnings' cases. Second, we wanted to include insights from different perspectives by involving participants responsible for different aspects of the case process. Citizens were recruited based on the criteria that they had received loss of earnings for the first time in 2016 or 2017. This was based on the belief that the details about their experiences would be fresher, and the data collected on their process would be richer. Data collection involved a combination of different techniques. We began our data collection by setting up interviews with the social workers in May 2018. The purpose of doing this was to establish an understanding of their perspectives on the case processes, typical steps taken, views of good and bad practice and, based on their experience and point of view, the challenges that citizens might face and what they believed was needed to overcome these. The interviews lasted about 60 to 90 minutes and were audio recorded.

After meeting with the social workers, we began studying the experiences and needs from the case process, as described by the citizens during interviews at a location outside the municipality. During interviews, we focused on gaining a detailed understanding of the case process and ideas for improvement. Besides an account of the steps taken, it involved an understanding of the roles of activities and the channels used throughout the case process. Finally, we set up a workshop with the social workers who were asked to share their ideas for process optimisation based on the previous insights. The workshop lasted for about 90 minutes and was videotaped. Addition material collected for this study included project plans and strategy documents obtained from the EcoKnow project, the municipality, and digitisation

[4] The analysis is conducted with fictional names in order to protect the identities of participants.

strategies from the government. These served as background to understand the formal declaration of the purposes and goals – representing the espoused values of stakeholders.

Data were analysed with open-coding in NVivo, to uncover emergent patterns within and across datasets. Inspired by the ethnomethodological approach to ethnography (Rouncefield, 2011; Randall et al., 2020), the focus was on participants' orientation when analysing the process for 'loss of earnings'. Rather than giving accounts and explanations of members values, beliefs and judgements, my interest was to analytically examine how these are organised and produced in members' own account and how they are embedded in practice (Hall et al., 2014). The key themes that emerged from the data were the difference in epistemologies and ontologies between participants and the municipal design team. Accordingly, the analysis section will concentrate on the participants' own way of making sense of 'loss of earnings' and how it led us (the project team of three) to think differently about the process.

6. Analysis: What is 'loss of earnings?

We entered the design process thinking that they were to improve 'loss of earning' cases. However, by turning to the perspectives of citizens and social workers (the users), we rediscovered the process in ways that were significant for our understanding and treatment of both the problem and solution. By identifying users' perspective, articulated in their reasoning about practice, we discovered that they ascribe a different meaning to 'loss of earnings' cases, what it represents and what it intends to achieve. In this section, I will first present the meaning of 'loss of earnings' as described by participants and the incongruence that emerged as focused changed from descriptions of previous to the design of future cases.

6.1 Loss of earnings: Not in a 'perfect world'

Before any design commitments were made, significant effort was invested in involving social workers and citizens as experts of their own experiences with 'loss of earnings' cases. As illustrated in the images below, this began by interviewing social workers to understand the steps taken as part of previous 'loss of earnings' cases, followed by interviews with citizens who had previously applied for - and received the service.

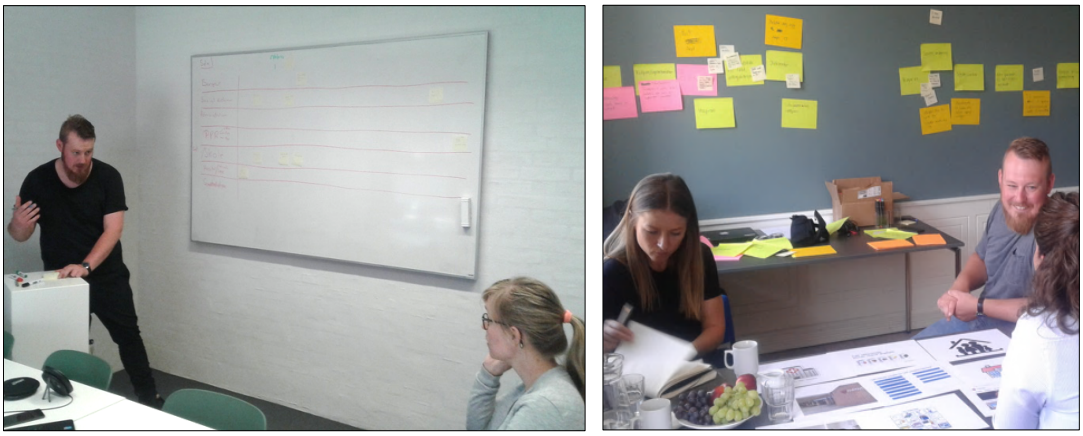

Image 1: Interviews with social workers (left) and workshops with citizens (right) in June 2018.

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The insights shared by the social workers and citizens were an eye-opener and revealed a need to critically reassess previously held notions of 'loss of earnings', which, until now, had been explored by the municipality and EcoKnow project from a legal perspective. The social workers' descriptions of the process turned out to be more complex, and it became essential to begin to disentangle some of that detail. We found that, while 'loss of earnings' legally addresses the financial compensation paid to parents, the social workers take the child's needs as the starting point in their work. They told us that, from their perspective, 'loss of earnings' is not about finances but about taking care of a child. To the social workers, the whole purpose of the service is to allow parents to look after their child.

'Loss of earnings' covers a broad range of physical and mental impairments in children and target a broad range of families with different resources and social backgrounds. A case might involve everything from a baby born with a physical handicap to a child developing a mental illness with no single identifiable cause. Some cases are straightforward and follow routines, but the social workers said that most cases are complicated and require intensive and comprehensive evaluations and intervention. The cases often build upon a long history of needs, problems and challenges that must be taken into account before any intervention is made. We also learned that parents who apply for 'loss of earnings' are often not aware of the services available to them, and often, they have never been in contact with social services before. The first time they hear about 'loss of earnings' is from referrals, such as the child's school, doctor or other third-party professionals. Common for most cases is also that parents turn to 'loss of earnings' when everything else seems to have failed.

> "[The parents] have gone on to the bitter end and compensated for a long of things, so when they come to us [to apply for loss of earnings], they've given up […] They're often very pressured. I mean, extremely pressured." (Anne and Marie, social workers).

'Loss of earnings' seems to be the final destination for parents, at a point where they see no other option but to stay at home with their child. During our interviews with citizens, they raised similar concerns. Citizens generally described their experiences with 'loss of earnings' as beginning years before actually applying for the service through the municipality. From citizens' point of view, 'loss of earnings' begins when their child shows their first signs of impairment. We also learned that the primary concern of citizens is not about *if* or *when* they might receive 'loss of earnings', which is a determining factor in the legal description of the process. The families do not start their day thinking about 'loss of earnings' or the status of their case. On the contrary, their focus is on what they can do to care for their child and their family as a whole. For the same reason, their process extends far beyond the point where they receive financial compensation. In one case, a mother told us about her daughter's severe anxiety and how they went six years before seeking help with the municipality. In another case, a mother shared her story of discovering her daughter's anorexia and the process they went through as it was getting progressively worse. In this case, it got to a point where the daughter could not eat, stopped seeing other people and weighed as little as 32 kg. Still, the mother was *not* reaching out to the municipality. Instead, she feared for her daughter's life and did not know what to do it but to be with her as a support.

> "I panic and call in sick. I just needed to be home. No one could tell me what to do […] Your child can go to bed and say goodnight, but it's not certain that she'll wake up again. That's where things are." (Lise, citizen).

The stories shared by the citizens gave rise to a new understanding of the case itself and what it means to be involved in the process. The stories also formed a stark contrast to the 'loss of earnings' process as it was initially defined and framed for design purposes. It suggested a need to broaden the view of the process and seriously reconsider design decisions, such as *when it begins, when it ends, and what happens in between*. From the interviews with citizens, it became clear that everything leads back to the point of departure, like 'my child has anorexia'. Anorexia, or other impairments, clearly identifies the problem but leave open the question of direction and solution. One thing was clear, though. 'Loss of earnings' did not and could not stand alone. By focusing too narrowly on the process, there was a serious risk of missing out on a crucial range of diversity that matters immensely for the people involved as part of these cases. In a similar vein, the social workers explained how 'loss of earnings' tend to create a negative cycle where problems 'feed' on themselves. The more social workers provide 'loss of earnings' to parents, the less they solve what they believe is a social problem.

> "'Loss of earnings' is very passive. The parents don't solve the child's challenge; they are just more at home with the child […] How do you help the child get through [the challenge they face]? We don't just say, *'well, then you have to stay at home'* because that doesn't involve a solution. So, that's what we talk a lot to the parents about; it's a condition to their family life [and our job] is to make them equipped to handle it for the rest of their lives [depending on the challenge]" (Anne and Marie, social workers).

The social workers were highly attentive to the complexity of 'loss of earnings' cases, to the point where they actively try to avoid them. If and when parents do receive 'loss of earnings', it is also always considered temporary and secondary to more pertinent issues in the long term. The social workers worry that 'loss of earnings' creates a chain of issues, since, what are the parents going to do when they can no longer receive the financial support, and how do they make the transition back into work a long period of unemployment?

> "When loss of earnings is granted, I'm very concerned with making the families aware that this is not a pretext for doing nothing. Well, I don't say that to the parents, but it's not… It's not fixed income support. It's for a period of time when there's a need for it, and simultaneously, we must work against that need for loss of earnings. So, where [parents] can become very focused on loss of earnings […] it's really important that we treat it as a short period of time. You shouldn't live on loss of earnings for the rest of your life […] We've become increasingly aware of this [internally], but we still have cases where parents receive loss of earnings on a full-time basis and… They're in a really difficult situation because they haven't been on the job market for several years […] So [besides caring for the child], we also need to help the parents." (Lone, social worker).

Based on the findings from interviews with social workers and citizens, the design team took a moment to reflect on what was now being proposed, as opposed to the legal requirements of the process. During the interview, one of them commented:

> ”I think it’s interesting how ‘loss of earnings’ is only a fraction, it may be a prerequisite for the family to be able to move on, but it’s not essential [to a case]” (Casper, project team).

We learned that key to designing a process for ‘loss of earnings’ is to take the complexity of everyday practice seriously. After conducting the first interviews, several discussions were held within the design team. The problem was that initially, the interviews had been specifically designed to understand existing ‘loss of earnings’ cases, and the design team had made a commitment to use these as the basis for modelling an *“optimal graph”* to be used as part of future ‘loss of earnings’ cases. This meant that, despite the democratic promises of involving social workers and citizens in the early phases of design, democracy was also negotiated in an effort to ‘stick to the plan’ and deliver on previously made promises. As an indicator of this, the social workers and citizens were often asked to turn back to their description of a more typical ‘loss of earning’ case, perhaps as these are easier to model. Longer conversations on the complexity of reality were acknowledged and celebrated but also treated as outside scope and a conversation gone ‘off-track’. As such, the social workers were consciously asked to turn back to describe ‘loss of earnings’ as a step-by-step process which, nevertheless, continued to be a challenge due to resistance from the social workers.

> “So, the mother got loss of earning for a period of time, but before that, there’s been many meetings with psychologists, healthcare and hospitals. So, there’s a history. (Sarah, social worker).

Despite several attempts made by the social workers to open up the idea of what constitutes a process for ‘loss of earnings’, some ultimately gave in to describe their work in ways that seemed more ‘fit’ for design purposes. They would do so in combination with terms such as *“in a perfect world”*, to create a necessary distance between what might work in theory and what applies in practice.

> “In a perfect world, I’ll send out [follow-up letters] about two months before the deadline… Maybe a month and a half, around that, I’ll send out that ‘now it’s almost time for a follow-up.’” (Sarah, social worker).

The interviews with social workers and citizens identified a clash between what is ‘perfect’ and what, to them, is considered ‘real’. It seemed like some ‘idealisation’ of reality was required to make ‘loss of earnings’ ‘fit’ for design purposes. However, as made clear from the interviews, it would risk hiding the complexity of cases and move them in a direction opposite from what the social workers aim to work towards. To the social workers, ‘loss of earnings’ is not about a process with defined steps but about relations between people. It provides a great example of how it might be difficult to ‘do’ design. Next, I will show how concerns about these matters became increasingly apparent as we moved forward in the design process and particular, as we invited social workers back for a participatory design workshop.

6.2 Participation in design: Does ‘loss of earnings’ exist?

Learnings from the interviews were brought to a workshop with the social workers a few months later. Based on communication sent out by the design team, the initial plan for the

workshop was to *"optimise the process for loss of earnings"* and create an *"optimal DCR graph"* to be used as part of future cases. Thus, at this stage, the focus of design had shifted from understanding current practices based on previous cases to inform design improvements for future scenarios. Based on interviews with social workers and citizens, the design team brought a collection of tools to help deal with design challenges during the workshop. As shown in the image below, these included case scenarios and cue cards, both informed by previously gathered insights. For the case scenario, the design team had created personas, such as a boy diagnosed with ADHD. The cue cards were based on previous case descriptions and suggestions made by the social workers and citizens. The reason for choosing ADHD and bringing cue cards based on the findings pointing to the complex reality of cases. For example, ADHD is a complicated diagnosis, and it is not always easy to tell what are the causes and what solutions are appropriate.

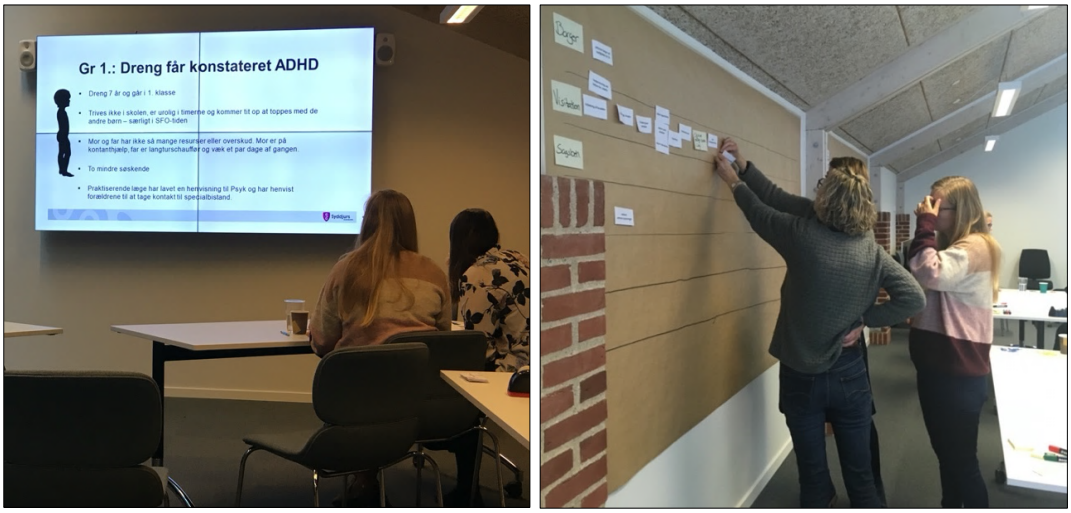

Image 2: Workshops with social workers in October 2018

As the workshop was kicked off, the idea was for the social workers to use the scenarios and cue cards to 'complete the process descriptions'. However, this was when we realised a different and more critical issue. To the social workers, while they recognise citizens' past experiences, they make a world of difference between describing a process based on the past and applying this for any future scenario. For the same reason, it was difficult for them to perform the task they were given for design purposes. In the following, we can see how the early design focus on 'loss of earnings' had not only framed the interviews but continued to frame the workshop. Note, in this case, how the workshop began with social workers discussing efforts to optimise 'loss of earnings' and how, at the time of the workshop, the whole idea of a process for 'loss of earnings' started to fall apart.

> Nanna, social worker: "It would we good if the citizen could access some type of digital platform, like […] 'my…', well… 'loss of earnings', or 'my case in the municipality', and see what is there and in that way, they could also […] see messages from the municipality […]"

Trine, social worker: "Then, the question is, when should they land on such a digital platform for loss of earnings? Because when is there really a case for loss of earnings? Because it doesn't really exist at this stage."

Nanna, social worker: "No…"

Trine, social worker: "There's an application, but we're not all at all at a stage where there's an approval."

Nanna, social worker: "No, that's exactly right. So, it may be… Well, I don't know."

Ida, project team: "So, we might say that there's only a case once…."

Trine, social worker: "Once a decision has been made, and that's actually happening much later."

We see here that the determination of 'loss of earnings' connotes the end of a process, at a point in time where a parent has been granted financial support. The example illustrates that 'loss of earnings' is a term covering different meanings and used differently by social workers (and others). To the social workers, it is only characterised as a process based on its outcome, and when they begin a new case, they never know what the outcome will be. There is no 'optimal flow' to the social workers, as was otherwise assumed by the design team as part of their communication and vision for the future. Instead, the social workers explained that it does *not* make sense for them to inform the design of a 'loss of earning' process or know how it is helpful to them because, from their perspective, the process only exists based on its outcome. New questions arose based on these insights, such as:

How do we design a process for 'loss of earnings, to be used by social workers in their new case management system if the social workers themselves believe that the process does not exist?

As shown in the below conversation between the social workers and one of the designers, these insights also changed the approach taken by the design team in their conversations.

Marie, social worker: "The biggest help for parents is to get help to be able to have a job, like, to be able to handle everyday life with their child, so they don't need loss of earnings. I will say this at all times, although I understand that parents are pressured and need to be at home. But in the long term, that's not helping them, it's really not."

Casper, project team: "But that's probably also why a big part of the guidance you provide to parents is to help them find a solution with work? Like *'do you have the opportunity to meet an hour later, and compensate for it somewhere else?*'"

Marie, social worker: "Yes. Can the grandmother pick up [the child] every Wednesday instead of giving the mother loss of earnings? Like, can we find other solutions, so they [the parents] don't think that [loss of earnings] is the only one?

From the above example, we see how the very means lead to situations where parents apply for 'loss of earnings', which is the same starting point used by social workers when looking for solutions. The social workers are legally required to guide parents who apply for 'loss of earnings', but the application may also be used as a resource in several other ways. In fact, the

social workers see it as their responsibility to encourage families to accept *alternative solutions*, which they believe will work better in the long term. As also indicated from the example above, these solutions are founded in the relation between parents and child, and between families members and, as shown below, between the parents and the social worker responsible for their case.

> "When [parents] ask about loss of earnings, they might get loss of earnings, but they might also get something completely different. In collaboration with their social worker, they need to find out what makes sense in their situation." (Marie, social worker)

> "We try to expand the possibilities, instead of just looking at what parents are applying for [referring to loss of earnings]. Of course, we have to deal with [the application], we have to do that, and make a decision and all that, But we… I think we put a lot of effort into saying, well, that *'it's not the only way to go. We can take other paths that will be more helpful to you in the long run.'* (Anne and Marie, social workers)

From the workshop with social workers, we learned that when parents apply for 'loss of earnings', the social workers do not think in processual terms as much as they think about relations. These learnings also led to a change in communication by the design team, who went from describing 'optimal workflows' to turn their focus back to the starting point of what might happen in a case that begins with a social worker receiving an application for 'loss of earnings'. This is illustrated below in an email sent out to the social workers by one of the designers once the workshop had been completed:

> "Thank you so much for some great hours yesterday. It helped us a lot in our understanding of the processes you go through when you receive an inquiry about loss of earnings.' (Andrea, project team).

At this point in time, the design team realised the challenges involved by having studied 'loss of earnings' as a process based on its outcome – and the awareness of having done so. This whole time, users had been involved based on their experiences of *historical* cases, and as the workshop made clear, there was a different kind of thinking involved when starting a new case. Until now, the design activities had been moving backwards, whereas the social workers are working forwards. To the social workers, it is not about different ways to a pre-defined end goal (such as 'loss of earnings'). Rather, social workers are concerned with *affecting* outcomes - which requires an open-ended approach and discretionary evaluation of each case.

7. Discussion and concluding remarks

As previously described, EcoKnow is often referred to as the Google Maps of rule modelling. Yet, as my analysis makes clear, there is a performative side to maps. They frame our understanding of what is supposed to be represented and just like a GPS, a process model treats plans as an attempt to prescribe actions that will accomplish some preconceived end (Suchman, 1987). Within CSCW and related fields, it has therefore long been argued to ground design in an understanding of the lived realities of everyday work. In this case, the municipality's process of developing a model for 'loss of earnings' had initially seemed trivial

and described by the internal project team as integrating the steps taken as part of the process that goes beyond the law. Instead, my analysis showed that according to citizens and social workers, an application for 'loss of earnings' does not reflect a step-by-step progression as much as it is multi-layered and involves working in many areas simultaneously.

The participatory design workshop further revelated the problems of translation between different perspectives. Tensions continued to rise and even when the discretion of social workers was noted as valuable to casework, the logics of how and in what way it was valuable conflicted (Voida et al., 2014). Notably, the analysis also shows that a view of street-level bureaucrats as policy implementers and technology users is valuable but also fails to recognise their contributions in making a plan and not just applying it to practice. By examining the values of social workers as street-level bureaucrats in the context of design, we see how the problem of public digitisation is not just the impact it has on how decisions are made and services are delivered. Instead, when involving social workers as co-designers of their own process – the object of modelling itself is challenged. Instead of discussing the steps taken as part of a process, we end up discussing if the process exists at all. This is taken for granted in much of the previous literature on discretion and CSCW research on the role of plans in practice.

Different disciplines each have different ideas of what is to be supported with technology. The most important tasks of CSCW researchers is to design technology that supports users in their practices. However, in this study, the collaboration made visible the difficulties of breaking free from a dominant interest in formalising legal texts at the expense of other activities. From the analysis, we see how the law became the basis on which the social workers' practices was compared. As previously described, the municipality's understanding of case processes was initially made through our colleagues' attempts to model the law used by social workers. Even though this did not involve a dictation of their workflow, the technology still came to represent a discipline towards 'optimal workflows' in the co-design project organised by the municipality, while no such thing existed to the social workers.

That is, I have shown that one cannot unproblematically go from the law-as-text to the law-as-modelled and assume an understanding of the law-as-practiced. For the the law-as-modelled to be meaningful to practice, it needs to be able to consider the context of the individual case as part of a 'bigger picture'. As I have shown, a piece of legislation such as 'loss of earnings' cannot be considered in isolation from what is, in fact, a multi-layered process of social work. One case process may be folded into other processes that the social workers expand and collapse according to the context and the circumstances of the case. Future research may be well advised, I think, to closely study the triangular dynamics of the law-as-text vs. the law-as-practiced vs the law-as-modelled. In light of this, as noted by Møller et al. (2020), identifying the characteristics of discretion becomes even more critical to allow social workers to engage meaningfully in a participatory setting.

Acknowledgements

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PUBLICATION 4

'THINKING PROBLEMATICALLY' AS A RESOURCE FOR AI DESIGN IN POLITICISED CONTEXTS

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‘Thinking Problematically’ as a Resource for AI Design in Politicised Contexts

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ABSTRACT

When designing artificial intelligence (AI) in politicised contexts, such as the public sector, optimistic promises of what AI can achieve often shape decisions around which problems AI should address. Different epistemological views carry different understandings of what is considered the problem at hand, and, as we show in this paper, ethnographic perspectives often fail to match the politicised promises of AI. This paper reflects on personal experiences from an interdisciplinary research project that aimed to take a responsible approach to research and design AI for public services in Denmark. Seeking alternatives to the inflexible algorithms [3, 38] often used to automate or augment specific decision-making tasks in these contexts [1, 2, 35], our research project took a flexible approach to research and design and included ethnographic workplace studies to explore whether AI could both leverage the increasing powers of computing and retain the discretion of the user [23]. Following Mesman [33], we present three empirical moments that were particularly challenging for us as ethnographic researchers and influenced our project in important ways regarding the problems for AI to solve. Problematising [6] them, enabled us to surface how ‘readiness’, emerging from the politicised context of AI in Denmark, had confounded our efforts at interdisciplinary collaboration. Problematisation, then, allowed us to come to a new understanding of the problem at hand and open up a space to collaboratively re-imagine the problems for AI to solve. This paper is in the spirit of serving as a bridge between our initial and revised understanding, pointing to the ongoing discussion in HCI about ‘bridging the gap’ between ethnography and design. Our contribution is a discussion of how researchers and designers might engage with problematisation at the frontiers of HCI to develop an open-ended approach to collaborative AI design in politicised contexts.

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CCS CONCEPTS

• **Human-centered computing** → Human computer interaction (HCI); Empirical studies in HCI; Human computer interaction (HCI); HCI design and evaluation methods; Human computer interaction (HCI); HCI theory, concepts and models.

KEYWORDS

Problematisation, Interdisciplinary research, Ethnography, AI design, Politics, Public services, Public digitisation

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1 INTRODUCTION

AI solutions are increasingly applied in politicised contexts[1], such as the public sector, where bureaucratic ideals like increased ‘efficiency’ and legal ‘compliance’ become strategically allied with AI’s promised capabilities to improve public service delivery [3, 38, 40] by automating or augmenting concrete decision-making tasks [1, 2, 35]. Examples of this include ‘Asta’, a so-called AI ‘assistant’ that was recently introduced in Danish job placement services with the charismatic promise: “With AI technology, it becomes possible for us to see what [is] required for an unemployed to get a job [and it] can deliver a better match than the caseworkers will be able to” [50]. Although solutions like Asta have brought scandals [32], the Danish government continues to invest in them [13]. Concern has been growing regarding human-centred design issues, such as fairness, accountability, and transparency[2] , and some in the HCI community have asked, “Who should stop unethical AI?” [25]. In social work [19], cases are characterised by high complexity and uncertainty, and the outcome of decisions can have a significant impact on people’s lives [42]. The implementation of AI systems weaves efficiency into the fabric of social work organisational practices [49]. Yet, as the ‘Asta’ example shows, excitement around large data sets continues to drive public sector AI design [53]. In Ames’ [4] definition, promises of such ‘charismatic’ technology can

[1]Here we adopt a broad understanding of politics, defined by Bacchi [6] as: *“the complex strategic relationships that shape lives”.*
[2]https://facctconference.org/

outstrip its actual capabilities, such that whatever their limitations, they perform an alternate reality, like enabling supposedly better decisions with more data [22].

AI solutions in politicised contexts often precede finding open problems, such that by the time ethnographic studies are conducted (if they are), formulations may have already been settled, including assumptions about caseworkers' roles in data-driven public services. The phrase 'readiness' has become widely used in public sector policy in Denmark to describe the preparedness of organisations to adopt, use, and benefit from new technologies, such as AI. The government has committed to a policy of 'digital by default,' and 'digital readiness' is considered a precursor to success. In 2018, it became mandatory to assess the possibility of making new laws 'digital-ready' so that when laws change or are newly introduced, relevant casework can be digitalised with ease [2, 34]. Since digitised laws require 'objective' criteria (that can be computerised and work equally across all cases), phrases that minimise the use of discretion (i.e. that allow for individual considerations to be taken into account) must be used by lawmakers. In our case, the idea of 'readiness' also stemmed from the agency funding our research project. As part of our project deliverables, the agency asked us to assess and measure the level of adaptation of technological integration according to 'societal readiness levels' and 'technological readiness levels' evaluated across our research settings [26, 27].

Despite growing concern with the politics of AI, less attention has been given to how ethnography can intervene in AI design by accepting, challenging, or diversifying the problems that AI is tasked to solve [33, 39, 44], which is the focus of this paper. This paper reflects on ethnographic moments from our interdisciplinary research project 'EcoKnow', aiming to take a responsible approach to research into AI. We wanted to explore whether AI could support an open-ended approach to public services in Denmark, avoiding the inflexibility that has been characteristic of this area. The lack of early openness to problem definition, characteristic of current AI projects in this area, also means that caseworkers - who directly interact with both the systems and the citizens - are often left out of fundamental design decisions [47]. In taking an alternative approach, we (the authors of this paper) ask amongst each other: in what circumstances is AI seen as a solution and by whom, what problems does it solve, and who defines the problems that need solving, and on what grounds?

In this paper, we offer problematisation, the notion of 'thinking problematically' [6], as an analytical resource to make visible the implicit views around the design space of AI systems that underlie, for example, the politicised context in Denmark, and impacted our project in important ways. We do this by reflecting with each other on the personal experiences gained from our own research into AI design (2017-2020) in this context. The project we report on, 'EcoKnow,' is a large interdisciplinary research project. As opposed to Asta and other available AI solutions focusing on risk prediction and citizen profiling, EcoKnow did not begin with a defined problem for which AI was seen as a 'charismatic' solution. Instead, EcoKnow wanted to explore if AI (as a rule-based expert system and through process mining) could 1) allow the municipalities to digitise rules and provide a better overview of the available paths through casework (while still being legally compliant) and 2) support an overall aim of increasing the perceived quality of case management processes, from the perspective of both caseworkers and citizens, who were involved as co-designers in the project. These foci were to be empirically investigated across a large team of interdisciplinary researchers and industry partners as a starting point for design.

2 WHY PROBLEMATISING?

A long stream of research in HCI, and related fields on ethnographically informed design, involves exploring how to relate the two disciplines [11, 14, 17, 48, 54]. Early studies point to clear disciplinary differences and their effects on collaboration, approaches to generalisability and abstraction [10, 21], and challenges in translating insights into action [18, 43]. However, though often narrowly represented in published work, ethnography can serve many purposes [45], including offering recommendations on what not to design [8]. Key to this debate is Dourish's seminal paper on 'implications for design,' in which he calls for broader engagement with ethnography as a critical interpretive frame for the entire site of HCI and not merely as a method for extracting user requirements. Approaches have been explored to position ethnography as deeply integrated into the design process [10, 28] or as the analytical lens to understand design in use [51]. As noted by Randall et al. in 'fieldwork for design', alternative ways of thinking might in themselves be important to design [46] because they would draw attention to areas others might not have thought of [17]. Recent approaches emphasise cooperation between ethnographers and designers and greater participation of the intended users of the designed technologies, drawing inspiration from the principles of Participatory Design methods [11, 52]. It is often the ethnographer's role to work out the best arrangements across settings (whatever that might be) [37] and act as 'mediator' to form a 'bridge' between the social (workplace) and technical (design).

From an HCI design perspective, early engagement is motivated by the aim to posit tensions and misunderstandings as opportunities for 1) clarification [28], and 2) mutual learning across epistemological divides [10] that can be incorporated into problem formulations [7]. Previous HCI research aiming to 'bridge the gap' between ethnography and design suggests the need for better integration and cooperation through early and direct involvement. If working relationships are strong, the technological solution will be grounded in shared meanings, and stakeholders will have a voice in the process. With the right methods, we can discover the problems we want to solve, and these problems will originate solutions. However, concerns have been raised over the relevance of current learnings on working relationships for future design problems [45]. As technologies evolve, ethnography is being interwoven with design in more complex and varied ways, raising new questions about the relationship between ethnography and design [10]. Recent findings from Neff [37] show that emergent technologies, in this case, data-driven AI, are shifting ethnographers' role toward more active engagement in design. With this new landscape comes new challenges and new opportunities. It changes the problems to be solved and the perceived role of technologies in solving them. As researchers increasingly work together in broader consortia, including academic and commercial practitioners, it becomes more apparent that multiple epistemologies exist, which entail different understandings of the problems at hand [36]. Reflexivity is at the

core of ethnographic inquiry, and research shows that more reflections are needed on the integration of ethnographic methods into the design of AI-type systems [45] and how problem formulation proceeds certain interests or integrates the interest of various stakeholders [39, 44]. Although these experiences are crucial for shaping research and addressing and negotiating challenges during fieldwork, they rarely find their way into research outputs [24, 29].

This paper is in the spirit of moving towards insights that can create a space for genuine AI collaboration in a politicised context at the frontiers of HCI, taking a modest step towards addressing some of these concerns. Aiming to avoid a gap between ethnography and design with an early focus on collaboration and integration, we found encounters in the collaborative work that challenged our understanding of our role as ethnographers. Findings from our ethnographic studies served as inputs on problem formulation in EcoKnow. We found that the empirical material often failed to match the charisma of AI's hype and hope found outside the project. Even as we made an effort to distance the 'EcoKnow' research agenda from dominant ideals and uses of AI, such as for profiling individuals [38], challenging encounters arose within the interdisciplinary work, which we will present in the analysis. Mesman suggests that reflecting on such moments can draw our attention to the tensions that arise in collaborative work [33]. We discovered in our project that, despite our attempts to intervene, our problem formulations continued to be imposed with the charismatic promises of AI, in the sense described by Ames [4], where promises had a life of their own. 'Asta', which was mentioned in the introduction as an example of a charismatic promise of AI to make 'better' decisions than caseworkers, serves in our case as an example of the context in which our research was continuously placed. We show in our empirical moments how charismatic claims that AI produces 'better' or more 'objective' decisions challenged the ethnographic insights on our project. We show how, between some of the stakeholders on the project, the charismatic promises became an epistemological perspective, that tended to confound empirical and design distinctions, such as between 'readiness' and 'AI', or what is meant by 'compliance' and 'discretion' in a public service context. By thinking of these moments 'problematically' across the duration of EcoKnow, we found that the problems belong to the politicised context within which our particular research project takes place.

2.1 Thinking problematically from the inside-out

HCI research on algorithmic fairness finds that critical issues of technological implementation are rooted in the work of problem formulation [39]. In contrast to identifying problems through shared meanings, 'problematisation' focuses on the emergent dynamic relationship between problems and solutions. Anderson [5] describe problematisation as: "An iterative process whereby obstacles are translated into problems to which emergent solutions respond (rather than the representation of a pre-existent object or creation of an object that did not exist) [citing Foucault 1997b]." Building on the Foucauldian-inspired notion of 'thinking problematically', Bacchi [6] describes this process as one that seeks to question how and why certain 'things' become a 'problem'. It involves analysing how something has come to be as such. Thinking 'problematically' thus helps to identify specific ways in which problems and issues are dealt with by those involved. By locating 'problematising moments', in which a shift in social reality takes place, we can see that what appears self-evident is, in fact, the result of 'politics' [31]. Seeing these politics opens up the possibility to ask how it could be otherwise.

Problematisation is a resource not only to critique current practice but also intervene in it and contribute to renewed understandings of what the problem is and how it may be solved.

In this paper, we use the notion of 'thinking problematically' [6] to understand the complexity of AI design in public services. Unlike Bacchi [6] and others [53] who study problematisation from the outside-in by engaging with predefined problems in practice, we arrive at our problematisations from the inside-out. That is, we use the concept of problematisation as a resource to retrospectively navigate through three moments that were particularly challenging for us as ethnographic researchers and which required careful detangling during the project, together with the Principal Investigator of the EcoKnow project. We initially parsed these moments together to support each other in navigating interdisciplinary challenges. However, it was by sharing these moments and thinking about them problematically that we came to see them as part of a broader problem: in our case, the politicised context that lends charisma to particular ways of approaching AI technology for public service delivery.

3 METHODS

This paper builds on ethnographic fieldwork conducted between 2017 and 2020 across multiple settings, as described below. We participated in the EcoKnow project to different degrees and with different roles. Author one, two, and four took an ethnographic approach to the multiple field sites of the study. Some focused more on the methods and shaping of the project and others on the municipal setting, including social services (a family department handling child welfare cases) and unemployment services (a job centre handling welfare benefits and job placements). Author three is the Principal Investigator, overseeing the project and the municipalities for whom the project is intended. During the project's lifetime, we (author one and four) performed several hours of observations and conducted multiple interviews with caseworkers and other project stakeholders. We ran participatory design workshops with citizens and caseworkers and attended internal meetings with both municipalities and our project collaborators. We published and presented our insights on an ongoing basis, along with making design recommendations and evaluating the technological developments with caseworkers towards the end of the project. In total, we performed more than 100 hours of observations and close to 50 interviews across both municipalities. We also collected and analysed multiple documents describing the policies and practices of both municipalities. For this paper, we (all authors) drew on our first-hand experiences from three years in the field (internally and externally). We used data from field notes, documents and emails to write about three individual moments in the form of vignettes. As part of an iterative process, we shared our vignettes with each other and contextualised our experiences to further develop the

final vignettes for analysis. Lastly, we used Bacchi's [6] notion of problematisation to analyse our three moments.

It is worth mentioning that research activities in this area bring practical challenges, such as issues of power dynamics between managers and caseworkers and designers and users. We are also aware of the impact of our research on caseworkers' future work practices and the lives of citizens (grounded, in many ways, in the questions we choose to ask and the places we choose to look). We can easily find ourselves in some kind of jeopardy, with all groups involved being sensitive to the implications of our work [9], albeit in different ways. For example, managers and caseworkers might not have the same views about what are the best practices for helping citizens as part of cases [12] – which further adds to the complexity of navigating AI research and design and in these contexts. Last but not least, we want to emphasise that the reflections presented in this paper are based on personal experiences.

4 ANALYSIS: PROBLEMATISING POLITICS IN AI DESIGN

In three different but related moments, we use 'problematisation' [6] to show how 1) the work practices of caseworkers turned out to be problematic during our encounters with industry and municipal partners, as it does not align with the promises of 'charismatic' promises of AI, 2) how reliance on legal processes challenged the inclusion of caseworkers' perspectives in the design process, and 3) how the charismatic promises of AI became visible through the multiple forms of 'readiness' defined outside the project, which came to work against the ethnographic approach of recognising a breadth of factors that influence work beyond rules and standards. We conclude with a discussion on how we, as ethnographic researchers, can prepare for a new role in AI studies, taking responsibility as part of the design teams we work with.

4.1 Caseworker discretion vis-a-vis compliance

Four months into our fieldwork, we are asked by the job centre management to provide a report stating the initial findings of our ethnographic fieldwork in unemployment cases. We see this as a great opportunity to make the field available to key decision-makers. Upon circulating the report, we are invited by the job centre management to present our observations. The presentation includes 'thick' descriptions of casework practice, such as the discretionary judgements used by caseworkers when interpreting the law for specific purposes and workarounds in the systems to overcome barriers in their workflow. The management (to the surprise of the research team) reacts poorly to the presentation. They ask the presenter (one of the authors of this paper), if her observations suggested a lack of compliance on the caseworkers' part. Some caseworkers, the report suggested, were not using the systems in the way they were intended. The management also asks her to account for the generalisability and thus the validity of her findings. They express a need to know: "Does this mean all of our caseworkers have to attend a training course [in how to use the caseworker system]?" They ask who were the caseworkers and what were their names?

We, the ethnographic researchers on the project, had not predicted the kind of legitimacy trouble that would arise from the ethnographic insights shared during the meeting. Before the meeting took place, we had considered the sharing of insights a minor point in the relative long agenda of doing fieldwork. The above experiences kept us wondering what went wrong and what we might learn moving forward. We retrospectively saw how it was not necessarily just the observations shared by the ethnographers that caused tensions and conflicts. Instead, it could be the misalignment in the setting of the meeting. We are told that our report will contribute to a baseline study from which one of the project's industrial partners, a consultancy firm, will build metrics to establish the level of the job centre maturity to digitise processes (which relates to the level of 'societal readiness' as laid out by the funding agency). However, despite our efforts to detach ourselves from studying 'readiness', our ethnographic insights became coupled with the third-party metrics to establish such metrics loosely coupled to 'societal readiness'. Whether the job centre management may have believed that the metrics had to take outset in an empirical understanding of caseworkers' practices remains an open question. Our role in the project was to have this empirical understanding, and we were therefore seen as the only ones positioned to deliver it. The problem was that our insights were recorded by us for one purpose but as they were shared in the meeting, they were believed to be used for different purposes. In this meeting, we experienced being engaged based on someone else's agenda (metrics on societal readiness) while simultaneously fighting to protect our own (the caseworkers' perspective of their work practices).

Time passed before we received a report from the consultancy firm, including the later developed measurements of 'societal readiness' for both municipalities. The report stated how these measurements were to be evaluated against: "the organisation's maturity to digitalise processes and benefit from EcoKnow technology and methods". It seemed apparent at this time that 'readiness' had become a measure that our ethnographic insights risked to be upheld against. Knowing this, we were able to reflect on the meeting differently. If the job centre was to evaluate their involvement in the EcoKnow project against their own organisation's maturity, or 'readiness', to digitise processes, their frustration with our observations and their interpretation of our findings made new sense. The municipality might simply have perceived it as reflecting a low 'readiness' that must be 'increased' by having caseworkers attend training courses. Still, the competing ideas (between us, the job centre management, and the consultancy firm) of casework practice, its problems, and solutions ran the risk of causing conflict with the management, potentially jeopardising our collaboration and the usefulness of ethnography in the design process. Similar to the experiences of Mesman [33], the shifting positions also made us feel uneasy. On the one hand, we needed to attend to the interest of the job centre management to make a purposeful contribution. On the other hand, we wanted to stay loyal to the caseworkers we had established a trusting relationship with and whose interest we were determined to represent in our ethnographic work.

By thinking about our experiences problematically, we identified epistemological conflicts that became visible through the 'link' created between discretion and non-compliance in casework. In these contexts, AI often represents an attempt to base caseworker decisions on 'objective' standards rather than 'subjective opinion' [22, 42], and in many ways, AI systems are represented as discretion's 'other'. As we will show next, this distinction can lead to

significant consequences later on in the design process, where influences on casework practice (such as caseworker discretion) may be rendered invisible through an emphasis on 'order'.

4.2 Process description and regulation

Halfway through the fieldwork with the other municipality's social services, the field researcher (an author of this paper) enters a smaller co-design project as a participant-observer. The project is organised by the municipality and seeks to merge traditional tools and methods[3] *for designing as-is and to-be processes with EcoKnow's approach to mapping rules and scenarios. The process is based on §42 in the Danish Act on Social Services and concerns the decision of whether to financially compensate parents for 'loss of earnings' when caring at home for their child with impaired physical or mental function. The co-design project is initiated to optimise the process for 'loss of earnings' cases, the first of many to follow in an internal development project. The initial idea is that the process leading to a decision includes steps beyond the law and that these can be 'mapped' from workshops with citizens and caseworkers who have been part of these cases. At a workshop with caseworkers, although providing crucial inputs to ways of optimising the existing process, we also realise a critical issue. To the caseworkers, while they recognise the past experiences of citizens that were brought forward in previous workshops, there is a world of difference between describing a process in the past and applying it to any future scenario. For the same reason, it is difficult for the caseworkers to optimise the process of 'loss of earnings'. That is when one of the caseworkers turns to the field researcher and says that it does not make sense for her to describe this process or know in what way optimisation of process outcomes is helpful because, to them, the process does not exist. It is only really categorised as a process based on its outcome, and once you begin a case, you never know what the outcome will be.*

From the workshop with the caseworkers, we learned that when parents apply for 'loss of earnings', the caseworkers do not think in processual terms (the order of tasks) as much as they think about relations (between themselves and citizens and between the child and their close relatives). We learned that when a caseworker receives an application for 'loss of earnings', it may never lead to the legal process of 'loss of earnings' and result in a formal decision about financial compensation to the parents. Instead, it might help them recognise a need for support that is differently placed and embedded in a relational network. These learnings also led to a change in communication by the municipal design team, who went from previously describing the co-design process as leading to 'optimal' processes - to turning their focus back to the starting point of what might happen in a case that begins with a caseworker receiving an application for 'loss of earnings'. At this point, the design team realised the challenges entailed in studying 'loss of earnings' as a process based on its outcome – and the awareness of having done so. The citizens and caseworkers had been involved based on their experiences of historical cases, and, as the workshop made clear, there was a different kind of thinking involved when starting a new case. Until now, the design activities had been moving backwards, whereas the caseworkers' are working forwards. These findings raised several questions for design, such as: How do we design a process to be executed by caseworkers if the caseworkers believe that the process does not exist?

Before the workshop mentioned above, we (the field researchers) had published and presented our ethnographic insights on casework [42] pointing to a contingent and relational nature of casework in the municipality where the co-design project took place. Key to our findings was that casework is always informed by the individual case and situation at hand. Rules are often broad and vaguely defined, requiring interpretation and demanding judgments by the social workers. While defining what the social workers must do, they do not explain how to go about it in practical terms. The criteria for decisions, the weight they should be given, and how they should be interpreted are all left in the hands of the caseworkers. Caseworkers need discretion in their work which, as previously mentioned, conflicts with the political idea of digital-ready law, as it requires objective criteria to be used equally across all cases [42]. The nature of discretion emerges for us ethnographic researchers as quite different from what emerges from a legal or political perspective, where it is often seen as something that can be restricted and controlled through law enforcement [20].

Taking the politicised context into account, this further challenges the opportunity for alternative views to enter the design process in concrete settings since the law quickly can become the basis of comparison for the caseworkers' practices and the perspective from which a 'process' is defined. By thinking problematically about our experiences in this context, it becomes clearer how political interests are at play in the design of AI systems and how they come to challenge – and be challenged by - concrete design efforts.

4.3 'Readiness' as a driver for AI design

As we near the end of the EcoKnow project, we are asked by the press how our AI systems perform and when they will be ready to be released for testing. Despite our attempts to promote an open space for AI design, we continue to see an interest in the 'charismatic' AI approach often taken by commercial solutions. However, since the project's beginning in 2017, we also note an increasing line of critical questioning of using AI systems for decision-making in public services, both academic and public arenas. The EcoKnow project worked around some of the risks, mainly through using rule-based AI, which is not subject to some of the apparent risks of AI systems, such as the machine learning algorithms used to profile and predict people's future. During our research, we consistently developed the idea that, in our case, AI should be researched and designed differently. Our ongoing ethnographic research (from 2017-2020) showed important nuances in the relationship between discretion and public digitisation, among others, the irregularities of data recorded in and through the caseworkers' daily practices and things "they would never write down" [41] as part of their documentation of a case. Co-design workshops in both municipalities also made visible the values of caseworkers, such as their interest in using AI for optimising internal waiting times as part of cases – shifting the focus from the individual citizens to the municipal organisation as a whole [36]. The question for our research project was manifested as how we can further develop and think along the lines of AI, which is not immediately problematic in terms of the biases inherent to all data.

[3] https://videncenter.kl.dk/viden-og-vaerktoejer/digital-transformation/servicedesign-og-brugerinddragelse/

'Readiness', it starts to be clear, is an epistemological object in which engagements and collaborations are confounded in a project on AI design for public services. This became particularly evident in how it continued to be necessary to work through and clarify our different epistemologies, which were reflected in how we considered 'readiness', 'compliance', 'legality' and other concepts that come to shape research and design in the politicised context of AI for public services. In our case, one notion of 'readiness' stemmed directly from the funding agency who provided schemes for applicants to analyse 'societal readiness levels' and 'technological readiness levels' as part of project deliverables [26, 27], and as a way of assessing and measuring the level of adaptation of technological integration. In this paper, we aimed to show how 'readiness', to us, is not merely an object of study but a temporal relation that shapes the possible epistemic positions for ethnographic inquiry. 'Readiness', with its rationalistic evidentiary regime [30] seems to further reify the upstream-to-downstream temporal flow of design by requiring baselines and comparisons to determine success and orients knowledge production towards readiness of the technology for society. In the political context, the society is expected to be ready for the technology, and data and digitalisation are narrated as necessary to secure welfare. Like the experiences of Mesman [33], our experiences taught us to leave behind the idea that the world we enter possesses a stable order. It became clear that, despite these assumptions sometimes being built into ethnographically informed and human-centred design research [7, 10, 28], early engagement and collaboration alone would not help us find a way out of our problem.

We learned how different epistemologies carry different understandings of what is considered the problem that AI can solve. We also learned that if we had taken this debate in isolation, we might not have arrived at those same empirical insights (in fact, the reflections in this paper required substantial collaborative work across the authors as we started to make sense of our personal experiences). Instead, we might have simply considered these bumps on the road for messy interdisciplinary collaboration, which is understandably rife with misunderstandings. We also realised that we might only catch a problematisation after multiple people experience similar moments on a project over time.

By reflecting on the moments put forward in the analysis, we could see three ethnographers' experiences, but not the experiences of others or the EcoKnow project as a whole. It is to be expected in a large-scale interdisciplinary design project that there can be an epistemological gap between what ethnographers understand to be their object of study and the needs of those collaborating partners requesting technological solutions. As Khovanskaya et al. [28] point out, the dominant discourse assumes that field research is in service of design. Christin [15] argues that we can explicitly enrol algorithms in ethnographic research, which can shed light on unexpected aspects of algorithmic systems, such as their opacity. Against this backdrop, the authors call for approaches to AI studies that - in situ - set out to epistemologically entangle ethnographic work and design to avoid creating an unbreachable epistemological gap and leave space for alternative understandings of the problem at hand for AI to solve (if any). However, the concept of readiness was persistent across these moments precisely because it created such a gap, which raises the question: on what premises does the notion of 'readiness' emerge in the project, and what is it a solution to?

5 CLOSING REMARKS: HUMAN-READY AI OR AI-READY HUMANS?

Throughout this paper, we use problematisation as a resource and theoretical lens to analyse ethnographic moments that we came together to re-discover as part of our involvement in an interdisciplinary AI design project. As Mesman [33] points out, roles, research, and power structures on a project can be quite fluid. These ethnographic moments, rather than being representative of a great epistemological divide between ethnographers and computer scientists or designers and industry and municipal partners on the project, were mere moments of debate or tension that were initially set aside. By sharing these experiences and considering them retrospectively, we saw with surprise that we carried certain epistemological viewpoints about AI into the project despite rejecting them in the project's initial problem formulation. Through our analysis, we discover the role that readiness plays as a broader problematisation within the political context of digitalisation in Denmark.

The writing of this paper raised new questions about the opportunities and constraints linked to collaborative AI research in politicised contexts. While we were trying to move between positions and sought ways for caseworkers and citizens to have their voices heard, we realised that we were missing a broader problem. We learned that we should not aim to ground design in 'shared meanings' but to acknowledge that we are not in complete control. Mesman [33] noted that we allow our observations to be disturbed in analytically productive ways through an ambition of not being in full control. Furthermore, as our analysis shows, this is the case for all actors in the field. Problematisation helped us understand how a lack of control of the design process originated outside casework practice and outside the EcoKnow project – caused by political forces.

By thinking problematically [6], we were able to see how AI quickly became a solution to a political problem. We found that the problem is not casework practice or caseworkers' use of discretion as they carry out their activities. Instead, the problem is that casework is constrained by political ideals of increasing efficiency and legality, and in this context, AI often become the tool to deliver on these promises. As such, our ethnographic research was positioned in an interplay between the research project and the political context it entered. In the context of AI design for public services, the EcoKnow project, with all its participants, is given the mediator's role to weave ideals of readiness (for example, digital readiness and societal readiness) in its activities, regardless of epistemological views. By focusing on relatively static factors, digital-ready legislation ignores case-specific factors and what it means to describe practice. 'Readiness' is also crucial for understanding *what is said* and *what is done* about AI. From national strategies to requirements from funding institutions, we see AI imposed through the lens of 'readiness'. The specific reason for introducing AI in casework are institutionalising AI as the natural extension of reasonable and legally just public services.

Our findings also affirm what Ames [4] has found; that the promises of AI, framed outside the project, continued to have effects well into the life of the project. This is perhaps notably how these promises shape the translation between methods (from ethnography to design) and what forms of epistemological contributions are considered appropriate. Therefore, our analysis is also an example of the difference it makes of who gets a say in AI design and how we, as ethnographers, must remain attentive to the power relations between different knowledges. Our role as ethnographers is not merely about grounding design in an understanding of casework practice; it is also a matter of how we navigate a highly politicised context. In line with Ames [4], we find that the ideological framework in which we operate is what allows us to evaluate the purposes they serve—and only by way of this 'cognisance' can we shift them. While this is often considered the ethnographers' responsibility, it is also an invitation to designers to identify their ideological commitments. Using problematisation to understand the different epistemologies involved in AI design also helps us understand their effects and, through this understanding, counter them. By allowing the design space to stay open, we leave room open to thinking about alternatives. However, in our case, we needed to think problematically to understand what those alternatives might be. As such, we hope that our empirical moments and reflective practice can become an inspiration for future design projects. If we do not problematise the politics inherent in the technological solutions we build, we may prevent them from having their full effect in practice.

Counting our gains (and some losses), EcoKnow enabled an alternative to the dominant ideals of AI as mainly useful for profiling individual citizens. The project refrained from designing a 'human-like' AI component, which we find confusing in a context where it is more important than ever to recognise human agency and accountability. Instead, EcoKnow documented the nature of discretion and interpretation of the law in casework - and designed and developed a system applying rule-based AI, allowing municipalities themselves to mine processes and digitise the law and other rules while leaving room for discretion and interpretation of the law by caseworkers. Hereto comes initial methods for engaging with caseworkers to identify problems to be solved with technology and the tracing of data from case management systems to activities practice. Choosing this alternative trajectory of an AI project needed to be continuously explained and justified to external observers. Still, our ways of approaching AI design in the EcoKnow project did not meet one of the municipalities' goals, and they eventually decided to switch to the tools offered by the company behind Asta (for reasons that remain to be elucidated).

As made clear from our analysis, ethnographically informed design is not straight forward. However, it helps avoid leaving out essential aspects of work in initiatives to support it, as it resonates with actual circumstances and not some 'idealised' version of events [16]. Ames [4] noted that one way to fight charisma is to deflate or be 'anti-charismatic'. With this paper, we call on AI researchers and designers to enable problematisation as a strategy for concretising alternatives to the dominant ideals, such as those we found in our project. We learned from our analysis and ongoing work on this paper that we need to be ready to have these discussions across epistemologies. Thus, problematisation is not just a valuable resource for ethnographers to navigate the design process – it is also a meaningful process for everyone involved in the design of technologies.

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