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In Search for the Perfect Pathway: Supporting Knowledge Work of Welfare Workers

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Abstract. This paper investigates the collaborative practices and computational artifacts that welfare workers use in a public welfare agency. Specifically, the paper focuses on caseworkers' knowledge practices related to assessing unemployed citizens and identifying 'perfect' pathways. I draw upon an ongoing ethnographic study, carried out in one of the largest municipal jobcentres in Denmark. Findings from this research point out that existing computational artifacts support compliance with welfare policy, while limited support is provided to caseworkers in helping citizens obtain an employment. The contribution of the paper is three-folded: 1) identifying fundamental characteristics of the caseworkers' knowledge work entailed in assessing unemployed citizens and identifying appropriate pathways, 2) examining the conditions surrounding these knowledge practices, and 3) discussing implications for the design of computational artifacts that better support local knowledge practices. While maintaining support to policy compliance, I argue that computational artifacts can also support 'data-driven knowledge', meaning the creation of knowledge that is based on data collected from the wide range of cases of unemployed.

1 Introduction

The majority of organizations today are aware of the increasing value of collecting and organizing their expertise and knowledge (Simon, et al., 2012). Knowledge practices have been a fertile research area across several disciplines, leading to a rich amount of studies under the term Knowledge Management (KM) (Pipek et al., 2011). Within Computer-Supported Cooperative Work (CSCW), the term KM has been replaced with 'knowledge sharing' and expertise sharing', to emphasize the social practices involved in knowledge sharing (Ackerman et al., 2013). Some studies focus on the knowledge repository itself, while others, focus on social aspects related to expertise sharing (*ibid.)*. Furthermore, there have been various qualitative studies of knowledge work in different organizations and various domains. This includes, for example, hospitals (Cabitza and Simone, 2012; Dovigo and Redaelli, 2010; Spence and Reddy, 2012), a steel mill's engineering department (Hinrichs et al., 2005; Pipek et al., 2011), aerospace industry (Su et al. 2011), aircraft repair (Lutters et al., 2002), non-governmental organizations (Saeed et al. 2010), as well as consultants and IT professionals (Orlikowski 1992; Spence

and Reddy, 2012). Shared to all these studies is the focus on the work of experts. However, there are, yet, no studies in CSCW of the knowledge work of caseworkers in public welfare institutions.

While some caseworkers are trained as social workers, some are not. This mixture of experts and non-experts makes knowledge work of public welfare workers particularly interesting. Recent work within CSCW has expanded to include other forms of knowledge communities, for example, social movements (Saeed et al. 2010), hobbyist groups (Torrey et al., 2007), and election officials and volunteers (Boulus-Rødje and Bjørn, 2015). This study enrols a new form of community constituting experts and non-experts in a municipal jobcentre. It focuses specifically on the front-line workers' knowledge work and the computational artifacts (Schmidt and Bansler, 2016) they use to assess citizens and select pathways; a topic which has been underexplored within the fields of CSCW and social welfare.

This paper draws upon a particular type of knowledge work, namely, that of front-line workers (i.e., professional coordinators, caseworkers, mentors and job consultants) in a public employment agency. I conceptualize knowledge work as the work that is entailed in 1) retrieving and assembling various types of information (e.g., about citizens, pathways, and policies), from various sources (documents, computational artifacts, and people); 2) processing and interpreting the information; 3) and reaching a decision and documenting it using various computational artifacts. The knowledge work of front-line workers in this agency requires familiarity with different kinds of knowledge about three domains: healthcare, welfare, and employment. Social workers are trained to interpret knowledges from these diverse domains, however, there has been a general lack of social workers in municipal jobcentres (Sabber 2017).

Examining the knowledge work of front-line workers is crucial, as they constantly face increasingly high workload and reduced resources (Balslev 2017). Coupled with the New Public Management, front-line workers experience increased managerial control, focus on performance measures, documentation, and efficiency (Lipsky 1980; Taylor 2014). Furthermore, the growing aging population and the effects of the economic crises are expected to increase the costs of welfare services (Vohnsen 2011). This has led to the increased implementation of welfare-to-work policies, and a paradigm shift from a 'passive' to an 'active' approach to social policy (Christensen 2005). Although previously, welfare recipients were merely obligated to be available for jobs, welfare-to-work policies 'activate' recipients by requiring some form of compulsory job search, training, work-based activity or education (Lindsay and Mainland, 2004). These are typically referred to as 'activation programmes', whereby recipients are obliged to engage in various activities ultimately aimed at improving their employability. Accordingly, all benefits recipients must be assigned at least one 'activation programme' once a year. Thus, every three months, caseworkers have less than 15 minutes to meet

citizens and help them obtain employment. This paper will provide an in-depth examination of the tasks taking place before, during and after these meetings.

The following research questions guided this study: 1) how do caseworkers carry out their knowledge work? 2) what are the conditions surrounding these knowledge practices? and 3) how can we design computational artifacts that support knowledge sharing and decision making which is grounded in local practices? To investigate these questions, I draw upon an ethnographic study (March 2015- ongoing) of the knowledge work of welfare workers in one of the biggest municipal jobcentres in Denmark. This particular jobcentre deals with citizens who are over 30 years old and suffer from additional psychical and/or mental health problems, beyond unemployment. The contribution of the paper is three-folded: 1) identifying fundamental characteristics of the caseworkers' knowledge work entailed in assessing unemployed citizens and identifying appropriate pathways, 2) examining the conditions surrounding these knowledge practices, and 3) discussing implications for the design of computation artifacts that better support local knowledge practices.

Findings from this research point to several fundamental characteristics of the knowledge work of caseworkers in public jobcentres. This includes the fact that their knowledge work is carried out in a highly bureaucratic and politically-driven organization, with constantly changing institutional demands. These unstable work conditions challenge the caseworkers' ability to carry out their work, exchange knowledge, and reflect upon existing practices. Furthermore, this research found out that existing computational artifacts support to a great extent compliance with welfare policy, while limited support is provided to caseworkers in helping citizens become employable. I argue that these systems can be designed to support 'data-driven knowledge', meaning, the creation of knowledge that is based on data collected from the wide range of cases of unemployed citizens. Such systems can allow data-driven analysis and reasoning based on locally-produced data, as well as query functions and data visualizations of pathways chosen at different times, in different ways, across various cases.

The paper is structured as follows: first, I present related work on social welfare, technologies in welfare and knowledge management. Second, I present the empirical case, as well as methods used for data collection and analysis. This is followed by an analysis of caseworkers' information retrieval, decision making and documentation practices. Finally, I discuss the characteristics of knowledge practice, the conditions surrounding these, and implications for design.

2 Related work

This study is located at the intersection of several research domains, including social welfare, welfare practices and technologies in CSCW, and CSCW studies of knowledge management systems.

2.1 Social welfare and public service

The literature within social welfare covers a wide range of topics. A central focus has been placed on studying the transition from *welfare* to *workfare* reforms, and the challenging working conditions that these reforms brought along on caseworkers. This includes, issues related to heavy caseload and caseworker training (Austin et al., 2009), as well as funding cuts and caseworker buy-in (Ridzi 2004). Furthermore, criticisms have been directed at the activation policies and at their dependency on local labour markets (Taylor et al., 2011). It has been argued that various reforms standardize the work practice of social workers, reducing their focus on counselling and increasing a focus on policy (Taylor 2014).

Rather than solely focusing on the impact of policy on local practices, this study provides an original contribution by focusing on the way in which knowledge work of social workers is influenced by various social factors (legal, financial, institutional and individual) and technical factors (the extent to which current computational artifacts support existing work practice). While many studies have explored the work of caseworkers in welfare agencies, little focus has been placed on investigating how they use paperwork (Taylor 2013). Therefore, this study examines how caseworkers retrieve, assemble and produce paperwork, how decisions are made and documented, and the extent to which these activities are supported by existing computational artifacts. I draw inspiration from the work of Zimmerman (1969), who focuses on record-keeping in a public welfare agency, and investigates how citizens records become a tangible product of compliance.

Three decades ago, Lipsky (1980) argued that public service street-level bureaucrats struggle with negotiating the contradictory job demands of helping people, while at the same time, being agents of social control. These demands place caseworkers in an inherently conflicted role where, on the one hand, they have relatively high discretionary power as they are the once who implement policy decisions. On the other hand, they do not have so much power as they operate within a highly regulated bureaucratic system of laws and policies, implementing decisions made elsewhere by others (elected officials) *(ibid).* As governmental representatives, they are obliged to follow strictly bureaucratic procedures to ensure efficient case processing and a uniform service level (Borchors and Bødker, 2011). Social service work is well-known for high stress, staff turn-over, and conflict with citizens (Taylor 2013).

Within CSCW, a significant amount of research has focused on knowledge work of various industries (e.g., healthcare, aircraft repair, IT professionals). However, relatively few studies have examined the work of street-level bureaucrats in social service agencies. For examples, Borchorst and Bødker (2011) examine how citizens share information with governmental offices, and Breit and Salomon (2014) and Verne and Bratteteig (2016) examine the impact of digitalization on public service encounters. Borchorst et al., (2012) found out that the stronger the citizens' ability to perform identities that are compatible with the bureaucratic

administrative process, the greater quality and swiftness the service. While these studies focus on the citizens' point of view, this paper focuses on the front-line workers and the knowledge work they carry out in citizens encounters.

CSCW scholars have long argued that it is important to critically examine the specific nature of an organization in which computational artifacts are realized. Social service agencies can be viewed as *human service organizations* (Hasenfelt 1983), with specific distinguishing characteristics. First, the organization's 'raw material' is people, and its mandate is to promote peoples' welfare (*ibid.*). Second, while outcomes can be easily assessed in business organizations (e.g., measuring profit), measuring accurately improvements in citizens' status and assessing outcomes is difficult in human service organizations (Pinelle and Gutwihn, 2006). Third, while many organizations (e.g., banking, manufacturing) follow a centralized control, human service organizations tend to be organized in a loosely coupled fashion, providing a high degree of autonomy to staff (*ibid.*). Forth, public organizations have normative organizational structures to ensure legal and political compliance (Snellen and Wyatt, 1993).

2.2 Technologies' impact on welfare workers

Within public management research, a few studies examine the impact of technologies on the work of street-level bureaucrats (Aurelien 2015). Some argue that technologies have diminished street-level bureaucrats' ability to use their discretionary powers as these automatize certain processes (e.g., rejecting automatically incomplete applications) (Snellen 2002). Others argue that technologies enhance the work of street-level bureaucrats (e.g., removing inconsistencies) and better inform citizens (Jorna and Wagenaar, 2007). Nevertheless, the use of electronic tools in public administration "has remained relatively un-researched from a street-level bureaucracy perspective" (Aurelien 2015, p. 150). Therefore, this study will examine existing computational artifacts from the caseworkers' perspective.

Within CSCW, a few studies have examined the digitalization of social service agencies. A study of early computational systems in social security offices (Snellen and Wyatt, 1993), have argued that such systems increase focus on bureaucratization and public administration, and reduce focus on citizens. More recent studies of public services suggest the design of systems that move away from lean and rational case processing, applying a citizens-centric perspective (Verne and Bratteteig, 2016). and improving citizen involvement in the configuration of service provision (e.g., supporting transparent and accessible understanding of the case processes, and including the rationale behind particular decisions) (Borchorst and Bødker, 2011).

2.3 Knowledge and expertise sharing

Knowledge management is a widely discussed topic across several fields. Two research streams can be broadly identified: the 'object-centric' stream which focuses on the repository itself, and the 'people-centric' which focuses on the social aspects related to expertise sharing (Ackerman et al., 2013). The first stream has a technology-design orientation, focusing on various issues related to building computational repositories. This includes, issues related to motivating people to add knowledge to repositories (Markus 2001; Orlikowski 1992); assessing reliability and authoritativeness (Brown and Duguid, 2000), and maintaining the repositories (Hinrichs et al., 2005).

The second stream within knowledge management is the 'people-centric', which focuses on interpersonal communication of knowledgeable actors (Ackerman et al. 2013). Being critical to the technical and managerial discourse in the first stream, CSCW studies shifted the focus from *knowledge* sharing to *expertise* sharing, emphasizing the close intertwinment of work and knowledge, as well as the situated, contextual and social nature of knowledge (*ibid.*). It became important to distinguish between 'tacit' and 'explicit' knowledge, where the former refers to knowledge that is difficult to articulate, verbalize and communicate (Polanyi 1966), and the later refers to knowledge that can be expressed, generalized, and easily shared with other members (Nonaka and Takecheuchi, 1995). Further work has been carried out by Nonaka (1994), who developed a knowledge conversion model focusing on codification of tacit knowledge to explicit knowledge (socialization, externalization, combination and internationalization). While Nonaka's model (1994) has been highly cited, it has received criticism from the CSCW community for obscuring what qualifies as tacit knowledge, ignoring interpretation processes taking place during these knowledge conversions, and following a simplistic and managerial view of knowledge (Schmidt 2012).

Another central topic in the literature is information reuse, referring to capturing, packing, disseminating, and reusing knowledge (Brown and Duguid, 2000). Capturing and packing knowledge involve codifying expertise and ensuring that knowledge is filtered, polished, structured, formatted, indexed and packaged for later reuse (Roth and Kleiner, 1998). Dissemination of knowledge can be done following a passive approach (e.g., publish a newsletter) and an active approach (e.g., convening a meeting) (Dixon 2000). Finally, reusing knowledge involves defining questions, searching and selecting appropriate experts and expertise, and applying the knowledge (i.e., re-contextualizing knowledge that was decontextualized when it was captured and codified) (Markus 2001). There are different types of knowledge reuse (i.e., shared work procedures, shared work practitioners, expertise-seeking novices, and secondary knowledge miners), necessitating different requirements for knowledge repositories (*ibid.*).

There are different kinds of knowledge repositories distinguished by the kind of knowledge they contain. Some distinguish between declarative knowledge (facts)

and procedural knowledge (*how* things are done) (Moorman and Miner, 1998); others distinguish between rational knowledge (*why* things were done) (Mora and Carroll, 1996) and analytical knowledge (conclusion reach when combining declarative and procedural knowledge). Furthermore, knowledge repositories can have different affording mechanisms, supporting 'awareness promoting information' (information about the state of a collaborative activity) and 'knowledge-evoking information' (information supporting learning and innovation) (Cabitza and Simone, 2012). Now that the theoretical framework underlying this study has been laid out, I will introduce the empirical case.

3 Empirical case and methods

I begin by presenting briefly the political discourse surrounding the empirical study, providing contextual background about the jobcentre, and presenting the methods used for data collection and analysis.

3.1 The political context

The work practice of social workers has been highly affected by contemporary neoliberal economic policies and welfare cuts. With the currently increasing public budgets, it has been said that welfare states have become a victim of changing times (Ridzi 2009). The social democratic welfare model needs to be changed (Jørn & Klaus, 2004), and this is manifested in the increased implementation of welfare-to-work policies (Christensen 2005), requiring benefit recipients to remain 'active' (e.g., through training, work-based activity or education) (Lindsay and Mainland, 2004). Denmark was among the first countries to embrace the activation paradigm, adopting a series of reforms in the 1990s that transformed the welfare system (Bonoli 2010). These initiatives are put in place to ensure that "*it should pay better to work*", the title of the government's plan for the second phase of the job reform (Beskæftigelsesministeriet 2016). This paradigm shift is conveyed by expressions such as, 'work before pleasure', 'something for something', or 'with rights comes obligation' (Christensen 2005). Thus, welfare has transformed from being a *right* of every citizen to being conditioned by *an obligation* to either work or remain 'active'. Unemployment in Denmark has fallen to 4.3 per cent, the lowest rate in the past seven years (Ritzau 2016). The official unemployment statistics do not include the three percent citizens who are engaged in various welfare-to-work programmes, as these are neither employed nor unemployed (Christensen 2005). Nevertheless, the expected increase in welfare services in Denmark has paved the way for various welfare-to-work policies (*ibid.*).

3.2 The organizational context

The ongoing ethnographic study (begun March 2015) upon which this paper is based, takes place at one of the biggest municipal jobcentres in Denmark. This jobcentre is one out of five public employment centres in the municipality, under the Employment and Integration Administration. This jobcentre has 230 staff servicing 14,000 unemployed citizens who are over 30 years old and suffer from additional problems that go beyond unemployment (typically, physical and/or mental health problems). Most of these citizens have a different ethnic background than Danish and have typically been unemployed for a long period of time. They have been described as the most complex citizens in the country.

According to the Employment and Integration Committee, citizens are to be divided into three target groups (Beskæftigelses- og Intergrationsforvaltningen 2015). Group 1 comprises citizens who are ready to 'leave the system' and obtain a job (e.g. through an internship, wage subsidies, part-time or full-time job). Group 3 comprises those who are more removed from the job market and require referral to one of the special schemes (e.g. Disability Pension, Flexjob or Resources and Development[1]). Finally, Group 2 comprises those who need to participate in various training programmes to improve their employment qualifications. There are different expectations to each target group (e.g., Group 1 citizens must obtain employment within a period of 52 weeks) (Beskæftigelses- og Intergrationsforvaltningen 2016).

The jobcentre constitutes an administrative department, including staff at the reception, administrative staff (dealing with calling citizens in to meetings) and security guards. There are three main departments: Job and Service which deals with Group 1 citizens; Resource Pathway and Development deals with Group 3 citizens; and three departments called Job Development 1, 2 and 3, who work with Group 2 citizens. In 2016, the jobcentre underwent a major organizational change where the different departments were reshuffled and merged into five identical departments. The idea underlying this change was to "*tear down the thick walls that has existed across the departments and professional groups*" (Karina, a development consultant). The department of Resource Pathway and Development who works with Group 3 citizens has not been influenced by this organizational change. Caseworkers in this department have approximately 76 cases and have meetings with citizens every six weeks (for 25-40 min), while caseworkers in all other departments have 236 cases and have meetings with citizens every 3 months (for 25 min). The group of caseworkers constitutes both staff that are professional trained as social workers and staff that are not. Nevertheless, all caseworkers are sent to a basic course offered by the Employment and Integration Administration

[1] Flexjob is a scheme wherein citizens work a reduced number of hours/at reduced capacity, and the employer is compensated by the municipality. Resources and Development may be assigned to a citizen for a period of 1 to 5 years, to determine the citizen's ability to work.

in this particular municipality. Furthermore, they go through training where they receive a mentor—a caseworker—whom they shadow for a three-month period.

3.3 Methods for data collection and analysis

I used various methods for data collection. I interviewed 20 front-line workers (interview length, 1–2 h), including management (the director of the jobcentre and heads of departments), professional coordinators (PC), project leaders, a development consultant (DC), caseworkers (CW) from different departments, job consultants (JC), preparation planners (PP) who work with citizens referred to the special schemes, and staff from the administrative unit. I also interviewed four citizens (interview length 1–2 h) who used to be unemployed, in order to learn about their 'journey through the system'. All interviews were conducted in Danish, and quotes included in this article have been translated by the author to English. I also conducted observation sessions in the waiting area and shadowed eight front-line workers (caseworkers, consultants, mentors and professional coordinators) during their daily shifts. I participated in various formal and informal meetings within and across departments, associated with workers during lunch breaks, and had formal and informal conversations with front-line workers, management, an IT specialist and the security guards. I also participated in a job readiness-training course, an IT course for citizens, and a two-day training session introducing the new IT system that was being implemented at the jobcentre. In total, 145 hours were spent in the field site. To protect the anonymity of those involved (directly /indirectly) in the study (e.g. informants, vendor and their IT-systems), all names used in this paper are fictional. I also collected photos and artifacts, and reviewed various documents, including brochures distributed to front-line workers and unemployed citizens, flyers posted in the corridors of the jobcentre, workflows descriptions and training manuals. Finally, I analysed media discourses and various welfare-to-work policy reports.

The data collected were analysed using a grounded theory approach (Charmaz 2006; Strauss and Glaser, 1967), beginning with open-coding data to uncover emergent patterns in and across data. Some of the themes emerging from the data included, work practices related to identifying suitable activation programmes, documentation practices, tools and technologies, and challenges encountered. In keeping with Lofland et al., (2005), after initially open-coding the data (using Nvivo), I used analytic memos to explore emerging themes. Initial open-coding revealed the centrality and pervasiveness of knowledge work across the data. I then used focused coding and further analytic memos to analyse the data focusing on the collaborative and distributed knowledge practices of front-line workers. I focused particularly on how front-line workers collect and retrieve information about citizens, processes information and reach a decision, and document citizens' encounters. I also investigated the computational artifacts used to support these

practices. I first synthesized the data through thick descriptions (Randall et al., 2007), focusing on the various knowledge practices of the different front-line workers, and identifying similarities and differences within and across departments. I also identified challenges related knowledge practices and the limited support provided by existing computational artifacts. In the rest of this paper, I will unpack the various knowledge practices, and discuss implications for design.

4 Knowledge work

Directing citizens to relevant pathways and helping them obtain a job is a complex collaborative endeavour, depending on knowledge from a wide range of domains. To examine the knowledge work of caseworkers, I begin by identifying the information channels and computational artifacts they use. Thereafter, I provide an in-depth examination of how caseworkers retrieve information, assess it and reach decisions, and document these.

4.1 Information channels and computational artifacts

Front-line workers constantly receive new information through different channels from various organizations. Political decisions and changes to legislations trickles down the chain of command, from the Employment and Integration's central administration, down to the various municipal jobcentres, and further to this specific jobcentre. Here, the information travels through the director of the jobcentre and further down to the five heads of departments, all of whom translate and adapt macro political decisions to the local context of this particular jobcentre. The heads of departments issue various internal documents and distribute these to the professional coordinators who are responsible for informing front-line workers in each department. Front-line workers receive large amount of information through various documents (e.g., emails, regular post, flyers and brochures), and meetings held across and within the departments. They are also sent to various courses and seminars, provided by the Danish Agency for Labour Market and Recruitment, the central administration, the municipality, the different organizations offering employment, etc. In their daily work, front-line workers use various computational artifacts and non-digital tools. It should be mentioned that this jobcentre is a 'paperless' organization. Most of the information sent to, and received from, various organizations is digital, and papers have a temporary status (e.g., caseworkers print out their notes from the last meeting with the citizen, use these to write down notes from the new meeting, and discard the paper once information has been entered into the system).

There are more than 20 different computational artifacts that different front-line workers use in their daily work (Figure 1 highlights some of the most important ones). Some computational artifacts are used by all staff, while others are used only

by specific professional groups (e.g. mentors use KAS; job consultants use Eltas, Mit Jobkompas and Jobspor). Other computational artifacts are designed for specific purpose (e.g., Planner used for calling citizens for job meetings, the 'development tool' used for assessing citizens' progress, and SmartBlanket /VIAS used for ordering activation programmes). There are also systems for interaction with citizens (e.g., a couple of web portals, a swipe-stand, and a digital interpreter system). Central tools used across all professional groups are the intranet (containing guidelines and a workflow portal), Outlook (the calendar and the email components), and various in-house templates.

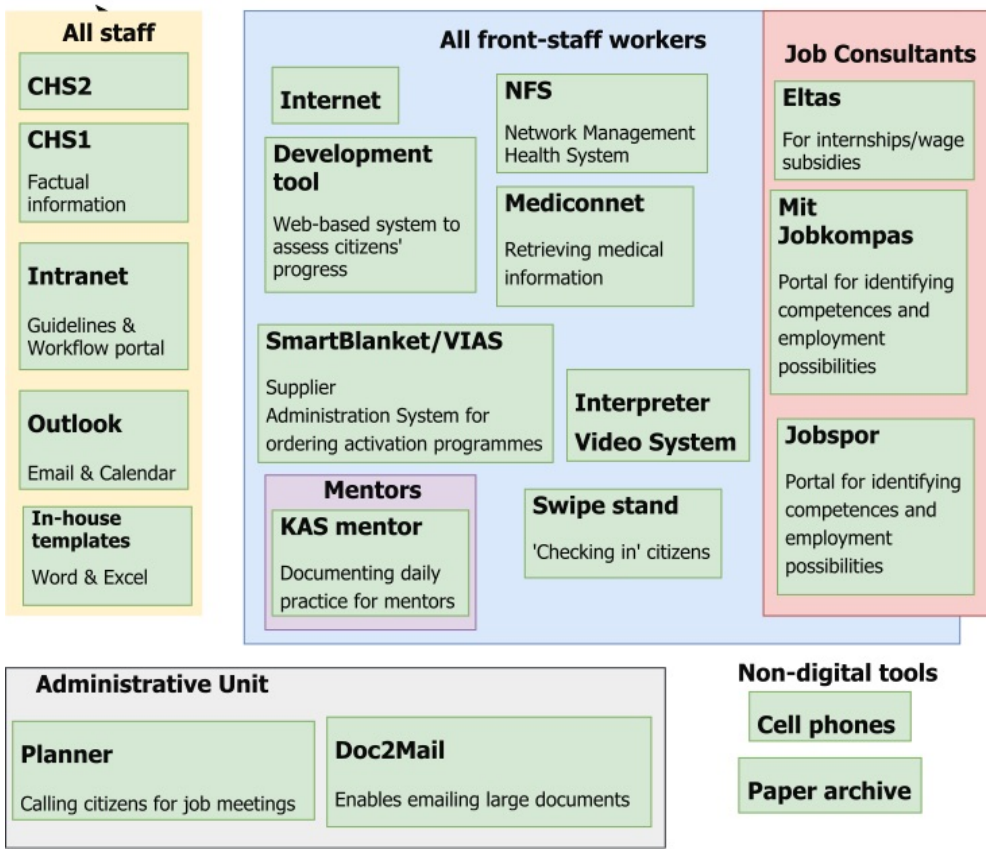

Figure 1: Computational artifacts

The central system is the Case Handling System (CHS), which is used by all professional groups. In 2016, the jobcentre replaced CHS1, the case handling system used since 2008, with CHS2, a web-based standard system (Microsoft product) which was adapted by VendorX, the new vendor, who also delivers legal information through their law portal. According to the Vendor's website, CHS2 is "based on flexible and modern standard technology… [thus promising to] revolutionize a market which has long been challenged". They vendor offers an additional component for screening, "a self-service solution" which "can automatically segment newly registered citizens", "automatically generate journal-

notes" and "make case handling efficient and goal-oriented" (The vendor's website). The transition from the previous to the new system is not entirely completed, and front-line workers still use components from the previous system.

Compared to the previous system, CHS2 inscribes stronger integration with the law and provides more guidance. For example, when assigning a programme to a citizen, caseworkers receive a reminder that 'the programme needs approval', along with a calculation of the cost of the programme. Furthermore, CHS2 inscribes greater automated control mechanisms. For example, it prohibits caseworkers from assigning citizens to programmes they are not eligible for and has a time limit on changing invitations to citizens and drafts of notes from job meetings. It is interesting to note that when asking front-line workers to identify the most critical tool in their daily work—besides mentioning CHS2—many refer to Outlook and their cell phones.

4.2 Information retrieval

The caseworkers' core activity is to meet the citizens every three months. These meetings are called 'job meetings', where the aim is to assess citizens' status, ensure they are sent to activation programmes at least once a year, and assist them in finding employment. There are various performance goals and many measurable targets for each department and caseworker (e.g., the department of Resource Pathway and Development is expected to create 35% internships). Following a recent internal change at the municipal jobcentre, caseworkers now have 25 minutes to both prepare for and conduct a job meeting. Whereas previously, caseworkers were expected to prepare themselves for *all* the meetings scheduled for a particular day, they are now required to prepare themselves only once the citizen has 'checked in' (scanned their personal insurance card). Caseworkers are asked to spend no more than ten minutes for preparation, leaving only fifteen minutes for conduct the meeting, assess the citizens' status, and help them find a job. Prior to a meeting with a citizen, caseworkers have to gather information about the citizens and different pathways available and relevant policies.

4.2.1 Information about citizens

When a citizen is referred to this jobcentre for the first time, s/he is directed to the intake unit at the reception, where s/he has a longer and more thorough interview, in order to decide which group s/he will be placed in and assign a caseworker. As mentioned earlier there are three categories in which citizens can be placed. Although these categories seem rather clear when reading official policy documents (Beskæftigelses- og Intergrationsforvaltningen 2015, 2016), their actual manifestation in practice is less clear. Asking front-line workers how they decide which category to place a citizen in, yield many different answers. Inger (PC), said: "*for those of us who have been working here for a long period* […] *we know this*

like the back of our hand". Thus, categorizing the citizens is something that highly experienced front-line workers know instinctively and intuitively. When it comes to new staff, Inger explains that, once they have completed their course and training period, they "*learn how to spot the right citizen [and assign him/her] to the correct group […] already after seeing… [the citizen] for the first time*". Nevertheless, as Jenny, one of the departmental heads (HoD) confessed, these categories are not easily applicable to their particular jobcentre, as they work with highly complex citizens who suffer from multiple problems in addition to unemployment. Jenny also referred to what she called 'artistic freedom', which gives caseworkers room to flexibly interpret these categories and their application in practice. Indeed, the gap between categorizations used in practice and those inscribed in computational artifacts—intended to activate standardized types of scripted interactions—has been discussed by various scholars (e.g., Martin et al., 2007).

While each target group has different resources and programmes, the areas that caseworkers focus on during the job meetings are generally similar. This includes the following three main domains: the healthcare domain (e.g., understanding the citizens' health issues and identifying relevant healthcare services and institutions), the welfare domain (e.g., identifying social resources available for the citizen, relevant disability funds, and/or activation programmes), and the domain of employment (e.g., identifying the citizens' job experiences and competences, and identifying manpower needed in the job market). Before and during each job meeting, caseworkers retrieve information from previous meetings, to see if there have been any changes in any of these domains (e.g., new documents received from healthcare institutions).

The different professional groups work a little differently as they focus on diverse areas, but there are general patterns related to ways of forming a coherent picture of citizens that can be identified across the professional groups. All caseworkers describe how they typically read notes from the last two-three previous meetings with the citizen. If information is unclear, they continue to read previous notes. Caseworkers working at the Resource Pathway and Development have more time for preparation. At times, they spend 1-2 hours assembling the various bits and pieces of information from the different systems, visualizing the citizens unemployment trajectory and causes to unemployment, and preparing themselves for the job meeting. However, spending such a high amount of time on preparation for the meetings is not feasible for caseworkers in the other five departments. After all, reading notes is a time-consuming task. Reading notes implies going into CHS2 "*opening a document, reading it, closing the document and opening a new one"* … "*One step at a time*" (Denise, CW). Denise developed a workaround, whereby she has a 'master summary document' in Word for every citizen she has, containing copies of her running notes from CHS2. This document provides her with quick and general overview of all her interactions with the citizen, compensating for the lack of time she has and the limited usability friendliness of CHS2.

Another clear pattern amongst caseworkers is the tendency to prioritize formal, authorized and summarized documents from public institutions. This includes, medical documents from doctors, recommendations made by rehabilitation teams and preparation planners (containing summaries of official documents from various institutions), pension applications, suppliers' progress reports, etc. Thus, in situations where there are discrepancies between the narrative told by the citizen and the one summarized in formal documents written by authorized professionals (e.g., healthcare personnel, welfare workers), caseworkers rely on the formal documents. These formal documents from various institutions, together with the caseworker's notes from previous job meetings, form a coherent picture of the citizen.

Interestingly, CHS2, the main case handling system, does not have one place containing all basic and factual information. This refers to information that does not change so often, for example, healthcare related information (e.g., substance abuse), welfare related information (e.g., past and present addresses of the citizen; marital status, number of kids), and employment related information (e.g., the citizens' professional competences, work experience, driver licences, level of education, length of un/employments). All caseworkers interviewed confirm that having factual basic data assembled in one place would be highly helpful. Some of this information exists but scattered across several systems. For example, an overview of the citizen's addresses can be retrieved from CHS1 (a component from the previous system which is still in use). Other information is not always easily accessible. For example, caseworkers have access to medical information from the citizens' primary doctor (assuming the citizens have given their consent), but they do not have an automatic access to other healthcare institutions. Thus, if the citizen has, for example, been admitted to a psychiatric department in a hospital and this has not been recorded in the primary doctor's notes, the caseworker would not know about the citizen's hospital admission, unless the citizen mentions this during their job meetings (in which case, the caseworker can request a copy of the patient's record). Therefore, citizens play a central role in directing caseworkers to relevant information from different institutions.

When I asked two highly experienced professional coordinators how they make sense of the vast amount of information, Linda smiled and said: "*it's called experience*", and Inger said, "*you learn to scan quickly notes...It requires knowledge and expertise*". However, forming a coherent picture of the citizen requires not only *expertise* and *experience*, but also, as Inger puts it, some *detective skills*:

> We haven't had any system that captures all information in one place, and it is a problem for the target group that we work with …So it has been an obstacle…a complication for us […] because one must be a detective in order to find all the information, and to know where to look and how to operate with these systems.

Because CHS2 does not display all relevant information in one place and some information is not easily retrievable or existing, caseworkers have to draw

connections between bits and pieces of information scattered across various systems.

Furthermore, some of the recorded information in not always accurate. For example, finding the citizen's length of unemployment is done by looking at how long the citizen's case was open and how long they received benefits. However, CHS2 will not capture citizens who did not apply for unemployment benefits. Furthermore, if the citizen's case was closed as they found an employment and reopened after a period of time, CHS2 would capture only the last date of unemployment. A more crucial finding is that a quick overview of previous employment experience and professional competence is not easily obtained. As Sisse (HoD), confessed: "*I still think that it's strange that an employment system can't support pulling out…the professional skills [of the citizens]. It is strange that we don't have one place where we can register he's a carpenter; he's an electrician*". She tells about an incident where a contractor who was responsible for rebuilding a burnt down building next to the jobcentre, came to the jobcentre asking if they had carpenters, electricians, etc. Although they have 14,000 unemployed citizens searching for jobs, they could not provide him with the workforce needed as they do not have a database allowing them to search the employment and work experiences of their citizens. Parts of this information can be retrieved from suppliers' reports and caseworkers' notes; however, it would be impossible to retrieve this information for every single citizen. To collect information about the citizens' employment experience and competences, the jobcentre has recently begun requiring their citizens to create a CV. This, however, has been a challenging task for Group 2 and Group 3 citizens.

Above I have pointed out situations where the various systems lack segments of historical information about the citizens. However, several caseworkers explain that, at times, historical information is, to a certain extent, irrelevant, as they focus on the present and future. Previous historical information about the citizen becomes predominantly important when caseworkers deal with an application for the rehabilitation team.

4.2.2 Information about pathways and welfare policies

Knowing the citizen is not enough. Caseworkers must also familiarize themselves with various welfare reforms and legislations existing at different points in time. I explained earlier how information about legislations travels from the Employment and Integrations' central administration and all the way down to the individual front-line worker. Changes are constantly made to legislations. As stated by Stine (CW): *"it's ridiculous how many reforms we've been through…so every time, we have to familiarize ourselves with something new*". All front-line workers expressed deep frustration about the rapid changes to legislations and the information overload they constantly experience. As Sisse (HoD), puts it:

> I think we get a lot of information ... Try to see here…it is totally unimaginable. It may seem very conspicuous when you get new rules all the time; new things that must constantly be changed... It may be frustrating for the employees […] …. since we are a political organization, we can never know when we should focus on something else.

In addition to information about legislations and policies, front-line workers must have information about the various programmes and pathways available for the diverse citizens' groups at different points in time. These programmes change every four years when new agreements are signed with suppliers. There are also modifications to the programmes offered, and the suppliers visit the jobcentre every year to present their offers. In 2016, the number of offers and suppliers was reduced. Nevertheless, there are more than 35 billable offers and programmes, and more than 60 programmes that are free of charge. Some programmes are offered internally by the jobcentre, whereas others are offered by external suppliers. Furthermore, some programmes are aimed at particular types of citizens (e.g. citizens requiring clarification of their work-abilities and citizens with socioeconomic problems), and they vary in length, purpose, content, and price. There once was an online catalogue that listed all programmes, however, this is no longer in use as it was difficult to keep it updated.

Thus, it is the front-line workers' responsibility to remember which programmes are offered at different points in time. This implies that the choice of a programme depends, to a great extent, on the caseworkers' memory as there is no search engine or catalogue listing all available programmes. The professional coordinators are responsible for ensuring that caseworkers are aware of the available programmes. This information is often provided during meetings and sent through emails from the departmental heads and professional coordinators to the different front-line workers. As explained by Denise (JC) "*There are constantly new emails [...] I personally save these in a folder containing relevant emails*". Each front-line worker has their own system for filling the diverse documents and sorting the different types of information.

4.3 Information processing and decision making

Once information has been collected from the citizen and assembled from different systems, a decision has to be made regarding the actions that are to be carried out. In practice, prior to meeting citizens, caseworkers print out the notes from the last job meeting and write on these their notes during the meeting with the citizen. Once the meeting is completed and the citizen has left the room, they type these notes into CHS2.

4.3.1 Assessing citizens and selecting pathways

There are different approaches to assessing the citizen, but they are all based on the underlying aim of identifying and addressing what prevents the citizen from obtaining an employment. This is negotiated and agreed upon with the citizen,

however, the caseworker is the one with the official authority to determine what will be defined as a problem and what will need to be dealt with. As there is no specific system to support the selection of the most appropriate programme, I asked all informants to describe how this decision is carried out in practice. Jenny (HoD) confessed: "*I have also asked my staff the same question and received as many answers as the number of employees"*. Thus, despite the similar underlying aim, there are different ways to assess citizens and decide which issues to address.

One approach, is to identify what prevents citizens from getting closer to the job market and 'correct' their behaviour. For example, citizens who do not speak Danish are sent to Danish courses, citizens who have substance abuse are sent to programmes dealing with abuse, and citizens with poor IT skills are sent to IT courses. If the citizens' physical and/or psychological conditions are unclear, they are sent to clarification pathways.

Another approach to assessing citizens is to identify their work-abilities. This entails a shift in the focus away from citizens' *limitations* to focusing on *resources*. I ask informants to describe how they identify work-*abilities* in citizens that have been unemployed for an extended period of time and suffer from additional problems beyond unemployment. Jenny (HoD) explains the process:

> If you prepare meals for a big family every day, you can make a plan […] You have some skills and personal competence that allows you to have an overview of a process… [You decide] when you need to…buy food, when to start boiling the water for the rise…You have some skills that enables you to manage a household […] So, you can extract some skills and help the citizen [identify these] ...Because, often times, the citizen says… 'there is nothing I can do'. But in order to manage an ordinary life, one can actually do quite a lot of things, right? If one has children… they need to wear cloths and have a packed lunch…One has some kind of daily structure…Why should one not be able to transfer such competencies to another kind of work? But [this does] not necessarily [mean that you should] work in a day-care because you…take care of children…. But…that it is perhaps a familiar and safe place to start... Because the issue with many of our citizens, is to conquer the fear associated with being employed.

As can be seen from the above, citizen's resources and qualifications are identified in their everyday life, in order to be translated into a work setting. This way of thinking is based on the premise that it is always possible to translate everyday competences to the work market. On the one hand, it can be said that this way of thinking makes sense. As further explained by Sisse (HoD): "*we motivate them by helping them find hope and belief in themselves*". Thus, identifying resources is intended to help citizens gain the self-confidence they lost when they became ill and unemployed. On the other hand, this logic is somewhat perplexing because the resources that are 'borrowed' from the citizen's *everyday life do not remain the same* when put into the labour market. Indeed, the departmental heads do not deny these differences. As Jenny explains, the identification of everyday competences is used as a starting point to discuss potential competences that can be used in the labour market.

Once competence and resources are identified, a discussion begins about ways of 'freeing these resources' and putting them into the labour market. This logic,

however, does not always hold so easily when applied into real life scenarios. Denise (JC), tells a story of a citizen who has Fibromyalgia (a debilitating disease with symptoms like muscle pain), which has drastically diminished her ability to function in her everyday life. She has learnt to live with it after 10 years and found out that she could clean her house by vacuuming everyday a different corner. Denise proposes to the citizen to contact the Social Administration and ask if she could get, for instance, a vacuum cleaner robot, to see if she has more energy which can be used in a workplace. Denise tells the citizen: "*we can free your resources and use these in the labour market*". But the citizen struggles understanding this proposal, as she still wishes to take care of herself and her own private sphere. Denise understands the citizen's struggle, but she tells the citizen that her application for the rehabilitation team will be rejected if they do not have documented evidence showing that all possibilities have been examined. Nevertheless, Denise points out "*they [the citizens] can't see…the point with all these small activation programmes they are required to engage in*".

I ask Denise to clarify the underlying rationale behind sending ill citizens to activation programmes. She explains that the general premise underlying the 2013 employment reform is "*that it is good for everyone to be attached to the labour market*". She then refers to the government's plan for the second phase of the job reform, entitled '*it should pay better to work'* (Beskæftigelsesministeriet 2016), to the guide that was developed outlining 'good practice' for Resource Pathway and Development (Styrelsen for Arbejdsmarked og Rekruttering 2016), and to the exhaustive and comprehensive documentation required to be eligible for disability pensions (Styrelsen for Arbejdsmarked og Rekruttering 2017). While noticing that she is jumping from referencing one reform after another, she smiles and says: "*perhaps I'm brainwashed after being here for three years and constantly hearing the same rationale*". This mantra, that 'it is good for all citizens to be attached to the job market', was echoed by every single front-line worker I have interviewed across the entire jobcentre. Such ideas of best practice typically come from institutions that are external to the jobcentre (e.g., the Danish Agency for Labour Market and Recruitment, the Employment and Integration Management, the Ministry of Employment), rather than being based upon the jobcentre's own data and experiences of what works best.

Identifying resources in every citizen is not always possible, despite substantial efforts of caseworkers. In some cases, for example with Group 2 citizens, there are not so many available programmes, thus they "*simply need to be assigned to some kind of activation pathway once a year"* (Karina, DC) to ensure compliance with the law. In other cases, citizens may simply be too ill and/or weak to take part in the labour market, are therefore typically assigned a mentor programme to help them with basic daily duties. I have so far illustrated how caseworkers use various approaches to select suitable pathways to citizens. However, the choice of a pathway is also influenced by various internal and external factors.

4.3.2 Influencing factors

Internal factors

The actual choice of a pathway depends on a wide set of factors that are internal to the jobcentre. This includes, among others, taking into account the citizens own wishes and experiences, and matching the type of programme to the type of citizen and the location of the supplier offering the programme. Matching the location is utterly important, since most citizens suffer from complex physical and/or mental health issues, challenging their ability to commute to different places.

There are also particular instructions specifying focus areas chosen internally in the jobcentre which front-line workers are asked to focus on during different periods (e.g., citizen with another ethnic background than Danish and homeless citizens). These focus areas depend also on the jobcentre's budget at different points in time. Currently, there is less budget for activation programmes, therefore, less citizens are sent to activations.

The choice of a programme also depends on the professional coordinators who are responsible for informing front-line workers of new programmes available and approving programmes ordered, in order to ensure these are suitable for the citizen and that they are aligned with the jobcentre's overall strategy.

Surprisingly, however, the choice of a programme depends to a great extent on the caseworker's own competences, and on their experiences of working with different types of citizens and assessing their potential (in)abilities to attend these activation programmes. For example, Ida (CW), tells that for citizens with extreme anxiety, "*I give them mentors, because they can't sit and participate in [such programmes] …Then they will simply not show up, and be sanctioned, and end up being thrown out of their homes, and it keeps going like that*". Reflecting upon her own experiences with such citizens, Ida is aware of the potential risk in sending citizens who suffer from extreme anxiety to activation programmes which they might not be able to attend, thus assigns them a less demanding programme.

The choice of suppliers is obviously also shaped by the types of programmes offered, but it also depends on the caseworker's own evaluation of the quality of offers. Caseworkers tell that there are some "*popular programmes*" and "*there are some suppliers that we all agree are shit*" (Ida). This is due to several reasons. First, consultants hired by some suppliers, lack adequate competencies to discuss employment goals with citizens. Second, suppliers do not have programmes that thoroughly and comprehensively examine the citizens work-ability. Third, suppliers do not provide comprehensive documentation and clarifications of the citizen's work-abilities. The current sole focus on documentation, particularly in the department of Resource Pathway and Development, leads caseworkers to choose suppliers that offer thorough assessment of citizens' work-abilities and provide comprehensive documentation.

Finally, the choice of supplier also depends on the caseworkers' personal contacts and relationships with the different suppliers. Several caseworkers explain

the importance of having a good relationship and "chemistry" (Ida) with the mentors/consultants on the supplier side.

A recent investigation in the jobcentre, revealed that caseworkers tend to choose the same programmes and suppliers. Thus, it can be said that choosing the same supplier is not merely a matter of having good relationship, it is also a pragmatic matter. As Denise confesses:

> It's easier for me if I only use one supplier, so I have better contact with them…I know who to contact, and I have better access to the organisation. Therefore, I make it a bit easier for myself also, consciously or unconsciously.

The increased focus on comprehensive citizens' assessments and thorough documentation, results in caseworkers using the same supplier and programme to coop with the high workload and limited resources.

External factors

The choice of a supplier and a programme depends not only on internal factors, but also on a wide range of external factors. This includes, the political climate and decisions made by the central administration, for example, the current increased resources provided to Group 1 and 3 citizens. According to the current political focus, caseworkers are asked to minimize the use of mentorship programs *"as these are not employment-oriented*" (Ida, CW). The front-line workers' selection of a particular programme is also influenced by the various documents they received from different external institutions, and information they receive in seminars they attend. The selection of a programme also depends on the types of programmes offered and available places in the different organizations at different points in time. As mentioned earlier, the number of programmes has recently been reduced. Finally, the choice of a programme depends also on analyses of the markets needs and concrete job possibilities available within the different branches.

4.3.3 Consequences and implications

Although the jobcentre tries to follow the mantra of a citizen-centric approach, the rigidity of the bureaucratic system does not seem to leave much space for the citizen. When asking caseworkers how they decide which programme would be most suitable for a citizen, they all refer to a wide range of predefined programmes—based upon compliance to legislations and policies—to which the citizen needs to fit. Consequently, ordinary citizens are transformed into preformatted categories and programmes. With limited amount of time and resources, caseworkers feel they process people and documents, passing them along a conveyor belt, and making uniform decisions. As explained by Maya (CW):

> I think it's a shame to see the current legislation developed [and political discussions about] de-bureaucratising [social work]. [Because], I actually think there is more…bureaucratisation. An increased amount of management tools is put in place to control caseworkers, instead of appreciating the profession and letting us do our social work. Because less…social work is carried out, even though we are dealing with ill citizens [...] So this also leads to the situation

> where there are fewer social workers at jobcentres, and it's a shame because there are a lot of things that require professional knowledge. But because things are so controlled, one could almost use a robot to carry out the work. It sometimes feels like a 'production line factory', especially with all these job meetings...

Furthermore, there is currently no particular system to support decision making of caseworkers, although they are typically certain similarities which can be draw from the various cases and enabling the generation of general knowledge about what works best. Inger (PC) explains that selecting an activation programme to a citizen "*is a professional assessment that the caseworkers make*". Therefore, caseworkers are left with a great responsibility of being familiar with all programmers available at different points in time. This also leads to situations where caseworkers chose the same programmes and suppliers as others, or to variations in work practices (e.g., some caseworkers carry out follow-ups with citizens who are in activation programmes through phone calls, while other require citizens for attend job meetings).

The above-mentioned factors, may lead some caseworkers to feel that they, at times, might lack solid basis for evaluating and ensuring the right decision has been made. Signe, a relatively new caseworker, explains:

> My concern is that if I do not do everything I can to assess [the citizen's] work-ability, he won't get his disability pension. So…I pull it as far as I can with his internship, to avoid a rejection when I send him to a rehabilitation team [which determines his eligibility].

Signe convincingly explains how she will continue to have the citizen in an internship long enough to ensure that the citizen is fully examined, and that the case has comprehensive documentation. I came to think of caseworkers who told me how they avoid sending particularly ill/weak citizens to activation programmes they cannot attend, as it might lead to sanctioning the citizen, who might become more ill, and eventually unable to afford housing. When I asked Signe about the potential consequences of keeping the already ill and unemployed in activation programmes for such a long period in order to ensure that legal requirements are met, she smiled at me and says in a perplexed voice:

> Yes, but it's right…it's a tough conflict you encounter because you're really in an uncertain position…One is in serious doubt…I'm really nervous that what I'm doing isn't thorough enough, so it may be that I keep him [the citizen] in an internship that might be harmful to him.

Once the assessment process of a citizen is completed and a decision has been made, these must be documented in the citizen's record.

4.4 Documentation practice

The documentation practice of front-line workers is highly standardized. Once the meeting with the citizen is completed, caseworkers type their notes following a template for documenting the meeting. The template is composed of the following section: employment goals, what prohibits the citizen from working, advice and guidelines, and actions to be carried out prior to the next meeting. Caseworkers

select the contextual information which they view as relevant to record in the citizen's journal. The notes are typically written in a highly standardized manner, summarizing information retrieved from various systems and documents, as well as information received from the citizen. In these notes, the citizen's story is translated into an objective and factual account. These notes contain predominantly traces of communication, and 'facts' about interactions and decisions made. These become tangible products of compliance, allowing reconstruction of information when necessary. Caseworkers have a 'documentation duty', according to which they are legally required to record all interactions with the citizen. As states by Stine (CW): "*Bloody hell, we have to type everything […] Today I have made 4 journal notes that I have tried to call the citizen, but the citizen didn't answer the phone call*". Caseworkers must type their notes the same day as the meeting, otherwise, it will be assumed that the citizen did not attend the job meeting and s/he will be sanctioned.

To summarize, information is retrieved by caseworkers, however, not all information is always accessible and/or existing. Thus, information gathering depends, to a great extent, on the citizen. The citizen's unemployment trajectory is documented, depending on what caseworkers view as relevant. While the case handling system supports to a great extent handling of *cases*, it provides limited support to handling the specific and complex issues encountered by *citizens*. In other words, the system support ensuring that legal requirements are met, however, it provides poor support in helping caseworkers find the most suitable pathway for a citizen. Half of the caseworkers' time is spent on collecting and assembling large amounts of information from different systems and sources, and producing information that records interactions and decisions. Yet, this information is not used by front-line workers for reflections upon existing practices. Typically, knowledge about local experiences is exchanged across professional groups either in an informal manner (e.g., during breaks) or during the weekly/biweekly cross-/departmental meetings.

5 Discussion

CSCW scholars have long argued that to understand knowledge practices and technologies used, it is important to examine the specific nature of the organization surrounding the practices. I will now identify the fundamental characteristics of caseworkers' knowledge work, by addressing the nature of organization, caseworkers' knowledge work, and decision making. I then discuss the conditions surrounding knowledge work, and the implications for design.

5.1 Characteristics of front-line workers' knowledge work

A significant amount of research within CSCW has focused on knowledge work of various industries (e.g., healthcare, aircraft repair, consultancy). However, relatively little research has examined the work of street-level bureaucrats in social service agencies. While a few CSCW studies examine citizen service encounters in government offices (Borchorst et al., 2012; Borchorst and Bødker, 2011; Breit and Salomon, 2014; Verne and Bratteteig, 2016), these focus specifically on the citizens point of view. This paper shifts the focus to the caseworkers and their knowledge practices.

Caseworkers' knowledge work is carried out within a public service agency; a human service organization (Hasenfelt 1983). These agencies have certain characteristics distinguishing them from other types of organizations, for example, the difficulty in accurately measuring outcomes in terms of improvements in citizens' status (Pinelle and Gutwin, 2006). Thus, while these public service agencies often have various performance measures and clear end-goals, these can be interpreted, achieved and measured in various ways. In this particular jobcentre, the outcomes and the success criteria are rather clear (i.e. citizens shall obtain a full-time employment), but what it actually means in practice differs amongst caseworkers. Furthermore, these public agencies have hierarchical organizational structures to ensure strict compliance to legal and political norms (Pinelle and Gutwin, 2006; Snellen and Wyatt, 1993). Such highly bureaucratic organizations must constantly adapt to the various political changes made to legislations and policies. This particular jobcentre has already implemented two major organizational restructuring in order to adapt to the changing political conditions. These constant political, financial, institutional and organizational changes challenge the caseworkers, who need to constantly familiarize themselves with new organizational structures and knowledges. This leaves little space for exchange and reflections upon existing knowledges and practices.

This jobcentre is different from other public service agencies, as front-line workers do not have granting authority, apart from transferring citizens to various programmes in other institutions (Sabber 2017). Because they primarily coordinate employment programmes, they must have knowledge about three different domains (i.e., healthcare, employment and welfare). Furthermore, what is particularly interesting about this jobcentre is that not all caseworkers are trained as social workers. To ensure that caseworkers have the adequate knowledge, they are sent to a training program and shadow another caseworker. This is what Nonaka and Takeuchi (1995) would call *socialization*, referring to the process where experience and tacit knowledge is shared through observation, imitation and practice. However, these skills and knowledges obtained during this initial period are not possessed once and for all. These are frequently modified to accommodate the constantly changing financial and political climates, as well as the institutional goals and strategies. In other words, these knowledges and experiences are

constantly influenced by the vast amount of information they receive from different external sources explicating 'good practices'. It is important to distinguish between different types and sources of information (Zimmerman 1969). Caseworkers in this study work with different types of documents, including official policies and legislations, internal guidelines and procedures, documents from external organizations (e.g., healthcare, other welfare institutions, and progress reports from suppliers), as well as internally produced documents (e.g., citizens' records, documents by rehabilitation team, applications for early pension).

In this jobcentre information is distributed to front-line workers using both passive and active approaches (Dixon 2000), and experiences are exchanged in an informal fashion (e.g., cross-department meetings, conversations amongst front-line workers). This can be viewed as *externalization,* which is the second process of knowledge conversion, where each front-line worker has a different way of sorting, categorizing and combining discrete pieces of explicit knowledge (Nonaka and Takeuchi, 1995). During the third process, bodies of explicit knowledge are synthesized and reconfigured leading the final process, where explicit knowledge is converted into tacit knowledge, and experience is internalized and embodied (*ibid.*). One of the clear characteristics distinguishing new from experienced front-line workers is that the new ones tend to struggle with the third conversion process of internalization; while the experienced ones, struggle with articulating explicitly their internalized knowledge. Experienced front-line workers often tell that they are familiar with policies and procedures like *the back of their hand*, referring to *experiences*, *competences*, *instincts* and *intuitions* to explain how they categorize citizens, establish a coherent picture of the citizen unemployment trajectory, and reach a decision. Furthermore, they tend to struggle with reflecting critically upon practices and policies. While the model of Nonaka and Takeuchi (1995) is useful for analysing the knowledge conversion processes of caseworkers and identifying the differences between new and experienced front-line workers, its managerial discourse does not provide space for fully capturing the caseworkers' dilemma of, on the one hand, following managerial rules and procedures; and on the other hand, feeling empathy with the vulnerable citizens and escaping and/or resisting the managerial control of this political organization.

I have identified a general pattern according to which the different professional groups prioritize formal and authorized documentation. This is similar to Zimmerman's (1969) findings that highlight the strong faith that front-line workers place in official documents. However, documents are only temporarily relevant in particular contexts (Lutters et al., 2002). I have pointed out how and front-line workers were not always necessarily interested in historical information about the citizen.

Nevertheless, the strong trust of caseworkers in official documents has typically been placed against the global doubt in the citizen's trustworthiness (Zimmerman 1969). This doubt entails a sceptical stance toward the citizen's subjective *claims*

and a commitment to establishing objective '*facts'*. Despite the caseworkers' doubt in citizens and trust in documents, I have argued that the responsibility for obtaining relevant knowledge and providing official documents is increasingly placed in the hands of the citizens (Breit and Salomon, 2014; Verne and Bratteteig 2016; Zimmerman 1969). This introduces challenges to citizens who do not know precisely what information is needed and why (Borchorst et al. 2012).

The Danish state has shifted metaphorical focus toward placing the citizen at the centre (Borchors and Bødker, 2011). I have pointed out how this particular jobcentre tries to follow a citizen-centric approach but is challenged by the highly bureaucratic procedures and strongly scripted institutional protocols and policies. While Borchorst et al. (2012) illustrate how citizens perform identities that match database entries that earn them entitlement for governmental services, I have illustrated how caseworkers also try to 'fit' citizens into pre-define categories, with different pre-scripted programmes. I have identified two approaches of 'fitting' citizens into rigid bureaucratic procedures, namely, 'correcting citizens' and 'identifying resources'.

Information about best practices come from external institutions, influencing decisions made by front-line workers. However, the process selecting pathways is influenced by additional factors. This includes internal factors, such as, the citizens' own wishes, internal focus areas in the jobcentre, the jobcentre's budget and strategy, the caseworkers own experience and evaluations of the programmes, and their personal relationship with suppliers. It also includes external factors, such as, the political climate and decisions made by the central administration, the types of programmes offered, and the market's needs. These complex and constantly changing internal and external factors lead caseworkers to choose the same programme and supplier.

Bureaucratic practice inevitably and necessarily entails a certain level of pragmatism and reductionism, categorizing citizens in order to allow equal treatment to all citizens (Lipsky 1980). Paradoxically, this leads to situations where front-line workers feel they work in a *production line factory*, passing citizens along on a conveyor belt, and making uniform decisions focused solely on measurable performances. These challenging conditions introduce a paradox for street-level bureaucrats as they are obliged to follow bureaucratic procedures, while at the same time, they can creatively choose to adopt to citizen's needs and specific context (Borchors and Bødker, 2011). My findings are consistent with other studies who found that these bureaucratic procedures lead caseworkers to spend more time on paperwork than assisting citizens find employment (e.g., Lipsky 1980). Indeed, it has been argued that caseworkers receive several indications that paper processing is more important than social work (Watkins-Hayes 2009). While others have argued that caseworkers use paperwork to feel effective within the constraints of bureaucracy (Taylor 2013), I argue that the increased bureaucratisation of the

caseworker's work is leading to frustration amongst social workers who feel they might as well be replaced by a *robot*.

5.2 Conditions surrounding knowledge practices and design challenges

Identifying characteristics of front-line workers' knowledge practises is not enough if we are to design technologies that supports these practices. It is also crucial to understand the particular conditions surrounding these practises. Some have argued that the transition to *workfare* reforms standardized the work practice of social workers, limiting their focus on social work and increasing a focus on policy compliance (Lipsky 1980; Taylor 2014). Additional challenges resulting from the workfare reforms, are issues related to heavy caseloads and caseworker training (Austin et al., 2009). Indeed, the current caseload in the departments Job Development 1-5 is between 230-250 cases per caseworker, which is *four times higher* than what the Danish Social Advisory Association recommends (Balslev 2017). Furthermore, preparation time for meeting citizens has recently shrunk to 10 minutes, and 3 months typically pass by between each meeting, challenging the continuity of programmes. Finally, caseworkers must ensure citizens are sent to activation programmes at least once a year, and there are approximately 95 programmes that change every two years.

More importantly, I have pointed out how there are more than 20 computational artifacts used by the different professional groups in this jobcentre. I have examined CHS2, the main case-handling system, and identified various limitations. This includes, lack of support for reading several notes simultaneously, making the task tedious and time-consuming, and leading some caseworkers to develop workarounds (i.e., the development of a 'master document'). Moreover, CHS2 does not have one place displaying all basic and factual information about the citizen. Some information is scattered across various systems (e.g. education), and other information is not always easily accessible (e.g. information from other healthcare institutions than the primary doctor). Some information is not always accurate (e.g. length of employment), requiring what caseworkers called, *detective skills*; drawing connections between bits and pieces of information. One of the important and surprising findings is that CHS2 does not provide an easy and quick view of citizens' previous employment experience and professional competences.

5.3 Design proposals

To address the challenges discussed above, I begin by listing a set of concrete proposals for design changes in the current case handling system, followed by two suggestions for different ways to support the dissemination and use of bottom-up best-practice.

There are concrete design issues which can be improved in CHS2. This includes, providing the possibility to read several notes simultaneously, as well as to collect and display all factual information (currently, partially recorded across several distributed systems) in one place. Figure 2 below contains a sketch visualizing the idea of integrating various sources of information in one screen, thus providing caseworkers with a quick overview of citizens' unemployment trajectories. Furthermore, unlike existing computational artifacts which take their starting point in *pre-define programmes and service*, this sketch takes a starting point in the *citizen's own* welfare, healthcare and employment conditions and only then provides an overview of available services and resources. In line with other studies, this research found that these systems support an increased focus on documentation and less social work (Snellen 2002; Snellen and Wyatt, 1993).

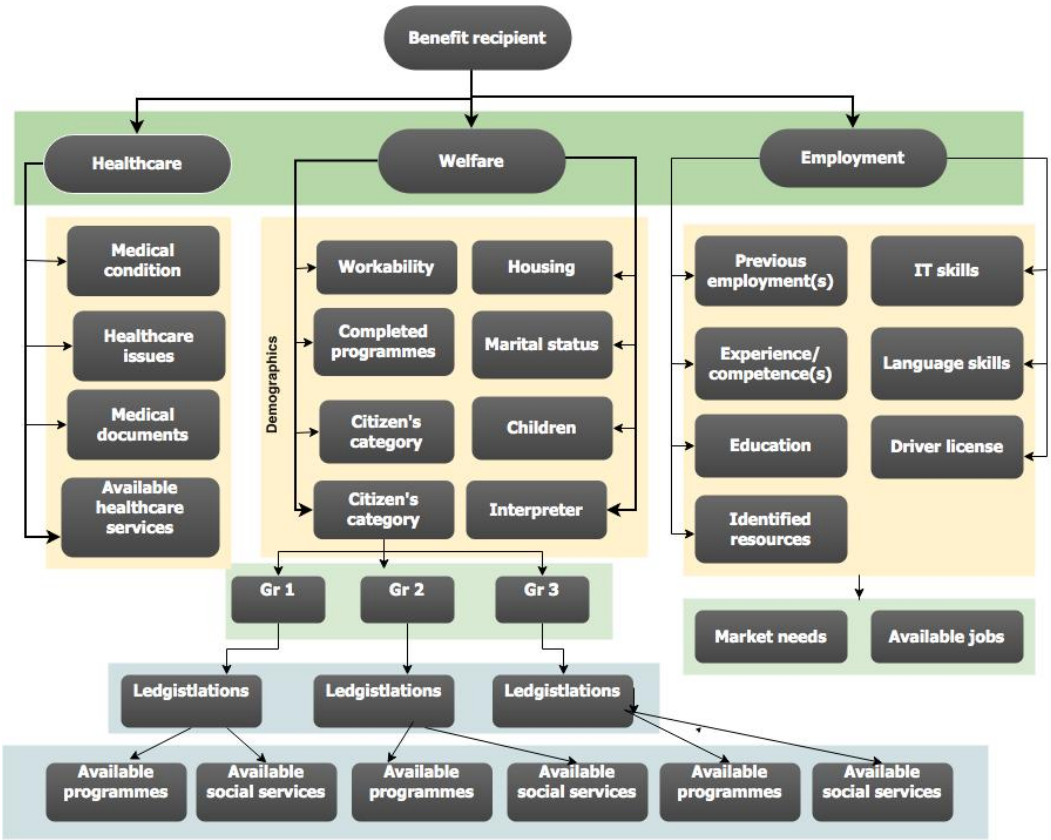

Figure 2: Sketch integrating various sources of information

Furthermore, existing computational artifacts are designed to support the dissemination of top-down information from external sources to the jobcentre. This includes, information about legislations, programmes, and suppliers, as well as formal guidelines for assessing citizens and finding suitable pathways. However, these artifacts fail to support sharing and dissemination of *bottom-up information*, that is, information generated by caseworkers about how they assess and select

pathways to citizens in *practice*. Front-line workers spend a considerably high amount of time assembling information, and documenting citizens interactions and activities. However, this information is not used for reflections and learning from existing local practice. As argued by other researchers, welfare workers can use the vast amounts of paperwork and information they generate to track what works and does not work, to uncover best practices, and better inform policy change (Ridzi 2009; Taylor 2013). Existing computational artifacts and information channels are designed to support best-practices based on welfare policy and legislations. Consequently, internally-generated valuable knowledge and local experiences go unnoticed. This is important as CHS2 does not support decision making regarding the choice of a programme, as this is viewed as a professional evaluation and decision of the caseworkers. I pointed out how this leaves caseworkers with the space for 'artistic freedom', enacting different practices. This may lead, particularly new caseworkers, to feel that they lack solid basis for evaluating and ensuring the right decision has been made. These design challenges lead me to propose two different ways to support the generation and use of bottom-up knowledge.

One way is to implement an online discussion forum to support daily communication and exchange of information. To a certain extent, the caseworkers' work entailed in searching and finding an appropriate programme to the citizen is relatively individual. Caseworkers have the possibility of asking for help from their professional coordinators and consulting their colleagues. There is, however, no formal space capturing these kinds of discussions, currently taking place during meetings and informal communication. Such an online space would supplement existing knowledge sharing spaces, as well as support real time exchange of knowledge and experiences of best-practices based on concrete and local experiences of caseworkers. Currently, CHS2 is used to extract information about end-goals and results. An online platform can create space for capturing information about the actual processes of interpretations and reasoning behind the results. Furthermore, such a platform can further support interdisciplinary collaborations across professional groups and departments; something which the jobcentre attempted to achieve with the last organizational restructuring.

Another way to support the dissemination and use of bottom-up knowledges, is to support 'data-driven knowledge'; that is, the creation of knowledge based on data collected from the wide range and diverse cases of unemployed citizens. There are several studies analysing various computational artifacts that are designed to support fostering knowledge sharing through, for example, capturing past experiences and encoding best practices (Markus 2001). In this jobcentre, existing computational artifacts support documentation and coordination practices, however, they do not support fostering knowledge sharing and capturing the diverse experiences across the different citizens' cases. To use Cabitza and Simone's (2012) notions, these artifacts fail to support 'knowledge-evoking information', meaning using previously acquired knowledge and supporting

learning across caseworkers. Such knowledge could provide basis for discussions about current practices and potentially foster alternative, explorative, and collaborative ways of assessing citizens and selecting pathways. The idea here is not of a static repository that simply stores information, but rather, of an artifact that can support generating new types of knowledges, as well as stimulate socialization and internationalization of knowledges (Nonaka and Takeuchi, 1995).

While it is understandable that such a bureaucratic public organization must comply to policy, I argue that computational artifacts can also be designed to support 'data-driven knowledge'. Such a system should not only harness the knowledge and expertise of caseworkers, but it should also encourage data-driven analysis and reasoning based on recorded data. A data-driven system would incorporate knowledge used in *practice* about assessing citizens and selecting pathways. It can become a powerful system that incorporates functionalities, such as, query functions and category tagging of different types of information (e.g., events, documents and pathways), as well as the use of visual language (e.g., Case Management Model and Notation), enabling the exploration of viable alternative possibilities to the current bureaucratic case handling system. Furthermore, a data-driven system would allow data visualizations of current pathways chosen at different times in different ways and cases. This would provide caseworks with an overview of their entire citizens' population (e.g., their demographics, professional competences, and characteristics) and their un/employment trajectory (e.g., different activation programmes assigned to citizens at different points in time, developments in the citizens' health conditions and in the citizens' level of work-abilities). Such a holistic overview is currently impossible or hard to discern. Furthermore, such a system would also comparisons across various citizens' cases and identifications of critical path. Supporting visualization of such large amount of data, can open the space for discussing alternative views of existing pathways and programmes. Furthermore, it can provide caseworkers with an overview of which programmes work better for particular types of citizens and when. Therefore, such systems can be highly powerful, enabling data-driven reasoning based on observed data, and challenging the search for the 'perfect pathway'. Furthermore, such systems could support reflections and learning, based on local experiences. This implies a move away from systems supporting top-down decisions, to supporting bottom-up data-driven analysis and decision making.

To be clear, the idea of data-driven knowledge system does not refer to systems that automatize the caseworkers' work practice, such as the idea behind VendorX Screening's 'self-service solution' which 'automatically segments citizens' and 'generate journal-notes'. Rather, the idea is to provide caseworkers with access to information which can provide a more solid basis for decision making. Thus, professional decisions regarding categorizations of citizens and selections of pathways should clearly remain in the hands of front-line workers. However, a data-driven knowledge system should support these decisions, for instance, by

contextualizing the individual citizen within the larger group of citizen population. A data-driven knowledge system which supports searching and visualizing the vast amount of data collected, can potentially help caseworkers detect certain similar conditions surrounding citizens, and certain combinations of programmes which may work better with particular types of citizens. This is not to say that a programme which was deemed helpful for a particular type of citizen will automatically be helpful to all citizens of this type. The unemployment trajectory of the citizens in this jobcentre is complex and unpredictable, and citizens go through various waves and rhythms of ups and downs. While there is no doubt that the various citizens' cases are unique and diverse, there are surely broad patterns and general connections which can be drawn from the data recorded about the 14,000 citizens that the jobcentre services.

Supporting a data-driven knowledge system implies taking into account issues related to maintenance and classification of records (Hinrichs et al., 2005; Lutters et al., 2002). Furthermore, supporting reuse of knowledge requires taking into account processes of capturing and packing knowledge, which involve codifying expertise and ensuring that knowledge is polished, structured, formatted and indexed for later reuse (Roth and Kleiner, 1998). Similarly, applying knowledge requires various processes of de-contextualization and re-contextualization (Markus 2001). Such knowledge could be used for several purposes, including producing knowledge for later use, producing knowledge for others, or mining knowledge to produce new knowledges (*ibid.*). Another critical issue is finding ways of integrating the vast amount of different types of information from different sources, which typically introduces substantial challenges related to searching and sorting data, dealing with hierarchical knowledge repositories, assigning ambiguous metadata, complying to organizational policies, etc. (Ackerman et al., 2013). Finally, existing computational artifacts contain declarative knowledge (facts) and procedural knowledge (how things are done) (Moorman and Miner, 1998); however, data-driven systems should lead to the development of analytical knowledge as well as rational knowledge (why things were done) (Mora and Carroll, 1996).

6 Conclusion

I investigated the collaborative knowledge practices and computational artifacts that welfare workers use in a municipal jobcentre. I found that existing computational artifacts support compliance with welfare policy, while limited support is provided to caseworkers helping citizens obtain an employment. To design systems that better support existing practices, I identified characteristics of the caseworkers' knowledge work entailed in assessing citizens and identifying appropriate pathways, and examined the conditions surrounding these knowledge practices. I highlighted the highly challenging conditions surrounding the

knowledge work of caseworkers, including external changes to policy and activation programs, internal institutional and organizational changes, as well as a constant increase in workload and reduction of resources. I pointed out various consequences of these conditions, coupled with the limited support provided by existing computation artifacts. It is important to keep in mind that caseworkers' decisions determine the fate of the citizens, and their success or failure can have long-term effects far beyond the concrete encounter with the citizen. Decisions made that are not appropriate for a particular citizen may lead the citizen to continue sailing around the system for years.

During Summer 2017, there were major demonstrations in front of various jobcentres. These protests have been reported in a special series in *Information*, a Danish newspaper, which dedicated more than 30 different articles about issues encountered with the current welfare system. Whereas social workers are accused for "*being fumbling desk soldiers*" (Sabber 2017); caseworkers, on the other hand, explain that "*no one can help vulnerable unemployed citizens to a better future in 25 minutes*" (Langhoff et al., 2017). While these political conditions are critical, I have pointed out several challenges regarding existing knowledge practices and computational artifacts. I argued that these computational artifacts should support 'data-driven knowledge', by harnessing the creation of knowledge that is based on data collected from the wide range of cases. This should enable data-driven analysis and reasoning based on recorded data, as well as query functions and data visualizations of pathways chosen at different times, in different ways, across various cases. Finally, there is a need for more research that explore further the use of computational artifacts in public administration, as it is still relatively underexplored from a street-level bureaucracy perspective (Aurelien 2015).

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