

# Assembling the Case: Citizens' Strategies for Exercising Authority and Personal Autonomy in Social Welfare

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This study examines caseworkers' and citizens' interactions when assembling resource development applications for citizens with serious health and personal issues. As with other types of welfare schemes, the application serves as a mechanism of both support and control. From our study, we illustrate how an increased reliance on data is transforming the citizen-caseworker interaction in social welfare. We characterize this transformation as 'datafication': a phenomenon where the increased reliance on data for decision-support across contexts of data production makes it challenging for individual citizens to contest or correct data-born accounts of their situation. Our contribution is two-fold: first, we empirically characterize the citizen-caseworker interaction in the application process. Second, we discuss how citizens' private resourcing complements the formal application process and provides them with strategies to give authority to their case and exercise personal autonomy. The private resourcing practices we observed show how integrating supplementary accounts from citizens into the systems that caseworkers rely on could make citizens' experiences and social context legible. This in turn has policy and technology design implications as public services increasingly introduce data-driven modes of case management.

CCS Concepts: • Human-centered computing • Computer supported cooperative work

## KEYWORDS

Digitization; Casework; Public services, Citizen-government collaboration, Decision-support, Accountability, Datafication; Autonomy; Agency, Vulnerable citizens; Information systems; Case management; Social Welfare.

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## 1 INTRODUCTION

In Computer-Supported Cooperative Work (CSCW) and the broader field of Human-Computer Interaction (HCI), researchers are beginning to understand the effects of datafication in professional work, including healthcare [15, 37, 57, 58], social welfare [13, 18, 19, 40, 51, 67, 68] and law enforcement [24, 61, 66]. Datafication *describes the phenomenon of increasing reliance on data-born accounts in the assessment of citizens in public service provision.*

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Just as businesses use new types of data to pursue profits, governments now seek new ways to use data to promote the public good [38 p. 78]. New data sets become available as data are repurposed and integrated with other data for uses that were often not anticipated at the time of creation [22]. A particular concern is how to regulate the use of data as they are de- and re-contextualized [1]. Such data migrations introduce questions about who has the right to produce data-born accounts about citizens [42, 52] and what is a fair use of such accounts [23, 67, 68].

The growing role for citizens whose personal data are acted upon – and even commodified – in order to conduct professional work activities (e.g. in law enforcement [61]) raises new questions on how citizens can retain personal autonomy [29]. Prior research articulates the need for a stronger focus on participatory citizenship and the citizen as co-producer of public services [10, 11, 18, 20, 21, 28]. This research has brought renewed focus on technology as a mediator of citizen-government collaboration, taking into account the perspective of government (e.g. data as a measure for ensuring efficiency and transparency in decision-making) as well as citizens and their strategies utilizing the processes around public service provision [10, 11]. These settings are important for their broad impact across society and because they put into greater relief the challenges of working across the deeply asymmetrical relationships of lay citizenry and appointed officials.

Professional public services work duties have been traditionally characterized by the discretion of officials who have role-specific expertise and authority when taking decisions that affect citizens [46]. According to Lipsky, government officials – street level bureaucrats – are often relatively free from organizational oversight, allowing for unscripted decisions that respond to contextual circumstances. However, in the wake of datafication, a more rigid and less legible use of data in decision-making displaces this latitude for professional discretion [26].

Coupled with concerns around the professional autonomy of government officials, contemporary scholarship has begun to shed light on how the datafication of services and service access points affects the populations who use and depend on them [10, 11, 17-19]. This research unpacks misconceptions about vulnerable citizens' ability to utilize technology. It also compels us to reconsider how to design services and interfaces that bridge between citizens in need and the institutional systems of aid and support.

To deepen our understanding of how datafication in public services affect specific kinds of service delivery, this paper presents an ethnographic study of how vulnerable citizens and governmental officials in Denmark collaborate while assembling an application to a social welfare program designed to enhance self-sufficiency and move people closer to the job market (e.g. subsidized jobs). These are citizens that struggle with serious health and personal issues. The application process we examined is an example of a new class of public service processes that increasingly use personal data to guide programmatic decisions. New process models for action that integrate data from several sources are currently being developed and tested as part of a larger research project<sup>1</sup>, with the aim of providing computer support by implementing these models. To avoid privileging the view of service providers and under-specifying the role of the citizen, the research project focuses on the work involved from both sides. Our goal here is to inform the design of these new models with a better understanding of citizens' preferred strategies for exercising authority and personal autonomy.

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<sup>1</sup> <https://ecoknow.org/about/>

To that end, our overarching research questions are: How is datafication – and data – in social welfare shaping the citizen-government interaction? Given this datafication, what is the citizen's role in assembling their case and how do they complement the formal application process to exercise their personal autonomy?

Insights from this paper extend prior research and reframe our understanding of citizens' preferences for how they act as co-producers of public services like social welfare. The paper seeks to deepen our understanding of data-driven public service and how to promote citizens' authority and personal autonomy in managing their data. The authority is lent via various citizen strategies, such as involving external support-persons, relying on simple technology (e.g. their smartphone for providing a doctor's supplementary account, or sending a photo to their attorney of a signed consent form); we discuss these as concrete examples of how this phenomenon unfolded.

We use 'private resourcing' in the citizen-caseworker interaction as an analytic frame that describes how recipients of care integrated both social support from family and support through evidence they created and curated with support of professionals such as their attorney or doctor. In this way citizens can give authority to their case and exercise personal autonomy through engaging with the data-born accounts. The concept 'private resourcing' further entails that the data-driven movement in public services is usually built on data *about* citizens, which in practice is often hard to access and contest by those same citizens. The private resourcing practices we observed in our fieldwork show how supplementary accounts from citizens could be integrated into a process such that their experiences and social context are legible to the system. This in turn has policy and technology design implications as governments introduce data-driven public services.

In this setting, the caseworker's knowledge of the procedures and regulatory environment remains critical for the citizens' ability to make the necessary contextualization of data (following Ackerman and Halverson [1]). As with other kinds of law enforcement, citizens' reasonable expectations of agency and personal autonomy can be achievable design goals. We argue that citizens' roles are central to the establishment of data's context, and that 'private resourcing' is a strategy whereby citizen - together with the caseworker - may calibrate data reuse. Thinking further ahead, citizens' abilities to contest data-born accounts about them may be considered as a measure for identifying 'good' cases and 'bad' cases for training algorithms.

Co-production in our public lives is critical to understand at a time when datafication is making inroads into every element of our lives. From the citizens' perspective, ensuring personal autonomy is key when citizens act on data about themselves and are acted upon by data about themselves – and others.

## 2 RELATED WORK

### 2.1 Differences in Classes of Systems

In social welfare, as in other fields of work, the caseworker system forms the main technical infrastructure [51]. In this system, personal data are turned into abstractions, permitting certain actions while foreclosing others [57]. These information systems sit at the intersection of 1) service provision – where government officials (caseworkers) do the work of collecting and acting on information about individuals – and 2) regulatory regimes – where data collection

occurs through individual service transaction, and data aggregation rolls-up for oversight and policy development, often losing important context in that process [18].

Supporting technologies often either prioritize the caseworkers and citizens, or the policy makers and regulatory bodies, leading to unresolvable conflicts and the creation of parallel systems [17, 18, 68]. We identify two main classes of systems and activity that are often blended into a single set of practices and support systems. The first class encompasses programs where civic services and interfaces are moved into digital forms and often take on the characterization of policy implementation and enforcement [10, 11]. These systems enable citizens to pay parking tickets and water bills, but also enable enrollment into social- and health services, provide access to public records, and facilitate public departments as they set policy and govern.

The second class of systems and activities aligns with practices in healthcare, where citizens' (or patient) records are used in the instrumental role of tending to the individual and informing the activities of the care professionals who orbit that individual while they recover [5, 27, 49, 50, 54]. Similar activities take place in public services, where social workers enter and track data about individuals to support their progress toward stability.

The role of the individual citizen greatly differs in each of these systems. In the first instance, the citizen is *acting on* information about their activities – e.g. paying a water bill or reviewing public documents. In the second case, the citizen is *acted upon* as professionals assess the effects of different programs (or treatments), and choose treatments or services based on the collected evidence of progress toward some resolution to the underlying condition (in health this might be the response to symptoms of disease; in public services it might be response to conditions of poverty).

## 2.2 Professional Discretion in Casework

Within CSCW, studies of professionals' discretion have mainly focused on settings other than social welfare; although, there are some empirical studies of public services [e.g. 10, 11]. One of the more important findings of these studies concerns the caseworker-citizen interaction where the citizen's identity is shaped in accordance with the administrative processes as a measure for success, e.g. smooth processes [*Ibid*].

Professionals' contextual judgment, what Lipsky establishes as 'discretion' [46], creates an important space for situated decision-making. When researchers in CSCW and the broader field of HCI have looked at the social service sector, they have established the link between attending to individual agency and institutional accountability [67, 68, 73-75] as important for the grounding of decisions. By creating space for agency and personal autonomy, systemic and programmatic interventions become more effective. For example, among homeless care providers in the U.S., there is evidence that outcomes improve when people can influence programs of care and set their own priorities [55, 64].

Institutional accountability plays an important role in enabling citizens' individual agency, because it means decisions can be understood and corrected when wrong. This manner of accountability is in part what Lipsky notes as street level bureaucracy, where the interaction and relation between officials and the public create space for contextual discretion in the application of policy, rather than systematic enforcement [46]. Within settings where the object of work is 'people' – as in social service, healthcare [49, 53], or public services – the ability for the citizens and the officials serving them to act and react together is an important element of providing care and not just systematically enforcing policy [47].

This 'people-factor' makes public service casework highly complex. As both sides negotiate the conditions and outcomes of receiving a service, both caseworker and citizen are attempting to 'work' the system by securing and managing limited resources. When this work includes navigating the procedures and regulatory environment of public service as well as the multiple platforms and technologies mediating and tracking access to public services, the individuals involved need to engage with a complex assembly of socio-technical machinery to arrive at a desired outcome. In framing data as a trace of an event or an action, certain motives, expectations, etc. are put to the fore to make sense of data as it moves across the technical and organizational realm [24 p. 4].

Prior studies in law enforcement [61] and healthcare [72] show that the alleviation of uncertainty and anxiety is characteristic of citizens' interaction when data are enacted or put to action. These studies suggest a strategy for design that ensures a higher level of information on 'what to expect next' [*Ibid.*]. Shklovski et al. demonstrates how citizens on the margins (criminal offenders) and parole officers' lives are disciplined through the production, migration, and recontextualization of location data [61]. Vos, Gerling, et al. [71] point to the burden of mobilizing stakeholders/ data and the need for technology to address this, supporting the arguments of our paper for better technology-support for citizens to leverage alternative data sources, what we refer to in this paper as supplementary accounts. We set out to understand how affected vulnerable citizens collaborated with government officials with the aim of shaping new regimes of datafication in social welfare delivery.

### 2.3 Designing for Civic Participation in Professional Work

One of the ways that CSCW and HCI researchers have approached these socio-technical questions of how to understand and design for settings where computational and social resources intertwine is through the concept of infrastructures [e.g., 14, 34, 43, 44, 60, 62, 63, 70]. Infrastructuring has been further developed as a concept in recent scholarship, which has shifted focus from 'building' information systems to 'building' capacities, including agency, within different community settings [2, 7, 8, 21, 25, 36, 47, 48].

Technologies, once deployed, take on a life of their own. When combined with early political motivations grounded in empowering the disempowered [6], then the most effective way might not be through new technologies alone, but by scaffolding ongoing collaborative practices where technologies and social structures and capacities are developed together to address future needs.

While Lee and Schmidt have recently pointed out disciplinary and ontological collisions through the term 'infrastructure' [45], they also emphasize that "*studies of infrastructure present a necessary challenge to CSCW because such studies are preoccupied with infrastructures that are created to regulate, connect, and intersect with local practices. Now, thanks to the contributions from infrastructure studies, this has more recently given way to research focusing not only on the use of existing technical infrastructures but also on how infrastructures are developed in relation to specific work practices, and how infrastructures are sustained over time including through leveraging other, related infrastructures*" [*Ibid* p. 31]. In this paper, we are mainly using the concept with a focus on the embeddedness of socio-technical systems and specifically on the collective design process of that embedding [8, 21, 25].

Infrastructures provide a way to understand where and how these systems succeed or fail in supporting civic participation [e.g., 12, 30, 33, 41, 59] and participation in public discourse [2, 3,

29, 62], not through a direct analysis of the caseworker system, but by the degree to which it alters the landscape and changes capacities to act within its context of use. The insights from casework in public services, we argue, may help us understand how citizens take on an active role in the assembling of their case to avoid privileging the view of service provider and under-specifying the role of citizen. Thus, we understand infrastructures as the relations and processes by which artifacts, systems, and practices are coalesced by the caseworker and citizen into resources that enable action.

Through establishing the multi-infrastructure sites of public services as seamful [70], as we will present in the case here, the citizens provide supplementary data in the form of different kinds of documentation and bringing in support-persons, as well as relying on simple technology such as a smartphone are concrete examples of how this phenomenon unfolded. Another layer of complexity is added, we learn from prior research, as we encounter emergent technologies set up to operate across settings and the ‘infrastructural grind’ that it creates when, for example, the legal requirements differ [31, 32]. In the public sector, policy-makers have the power to redefine governmental institutions across those lines. This makes it challenging for citizens (and also nonprofit organizations and others providing additional support [9]) to exercise authority and personal autonomy as settings like social welfare are continuously shaped as a consequence of the shifting politics of democratic society.

One question for our work is: what are the processes and regulatory environment in social welfare where high stakes make even vulnerable citizens engage in patching together the relevant infrastructure for the assembling of their case? For the purpose of design, how do such practices, when the scale is smaller, translate into concrete suggestions supporting citizens while retaining important qualities of professional work? Moreover, how would this civic participation at scale look in a public service setting that is trying to integrate new data-centric practices for assessing needs and delivering services?

### 3 CONTEXT AND METHOD

In 2013, the social area in Denmark underwent a massive reform, introducing a new resource development program. The purpose was to increase the total resources of society by moving vulnerable groups of citizens closer to a job (either subsidized or not). The reform was controversial because it applied to citizens that would normally be granted early pension by the welfare state due to serious personal or health issues. Now, citizens’ applications for early pension would be desk-rejected if the citizen was considered employable, even if only for a few hours per week. The formal purpose of the reform was:

“[...] to retain as many as possible in the labor market – preferably in non-subsidized employment. The reform is intended to ensure that the future will see an increased emphasis on the resources of the individual and the development of his or her working ability. Therefore, rehabilitation teams have been established in all municipalities. Here, the employment-related, social and health-related resources and challenges of the individual will be clarified simultaneously, focusing on training, employment, and financial independence”

[The Danish Government 2013 p. 17]

### 3.1 Service Infrastructure

Rehabilitation teams are formally responsible for the administration of the resource development program. They are cross-organizational constructs, competent in both health and personal issues and often co-located with the municipal job placement service. The resource development program offers different types of activities that may be granted to vulnerable citizens, such as therapy, mentoring, and addressing health issues. It also allows the citizen a break from standard requirements for job searching.

Caseworkers contribute to the administration of social welfare by registering and sharing information about the citizen. This includes information about their current employment, activities related to job placement, education, social and health services, as well as the citizen's current welfare enrollment and payouts. These data are saved to The Common IT Database (*in Danish* Det Fælles Data Grundlag - DFDG) – a national web service used by caseworkers working on behalf of the government.

Once a caseworker from the municipal job placement service and citizen are matched, the application process for a resource development program typically takes a few months.

First, a caseworker prepares a draft rehabilitation plan in a meeting with the citizen. Based on the first meeting, the caseworker requests data that are considered relevant for the case from The Common IT Database – supplemented by the citizen's own information on current personal and health issues. The citizen may also provide supplementary input (e.g. a support-letter from their doctor or therapist). This study focuses on the initial part of this process of assembling a citizen's application and case documentation.

Second, after the meeting with the citizen, the caseworker sends the draft rehabilitation plan to the secretariat of the rehabilitation team that monitors timelines and makes sure to check that all relevant data has been collected. The secretariat coordinates across the rehabilitation team, which includes the municipal employment agency, social agency, health agency, the child and youth agency if the citizen is younger than 30, and the medical consultant representing the health region.

Third, the rehabilitation team discusses the application, including the draft rehabilitation plan, with the citizen and any individuals supporting their care (e.g. family, therapist, doctor or counselor etc.). The rehabilitation team meeting is considered as a legal hearing of the citizen. The rehabilitation team makes a final recommendation in the meeting and makes sure that all relevant perspectives are taken into account.

Fourth, a caseworker that is considered competent in the case makes the final decision as to whether a resource development program is to be assigned to the citizen – or if any of the other social welfare schemes are a better match (including early pension or a subsidized 'flexi-job' on reduced hours). The caseworker informs the secretariat about the decision, and another formal hearing of the citizen is conducted. Formal complaints can only be submitted after the rehabilitation team concludes case management.

Fifth, a (new) caseworker in the job placement makes a detailed plan with the citizen for their rehabilitation and begins the process of initiating relevant actions. A resource development program can last up to 5 years and may be extended 3 times.

### 3.2 Technical Infrastructure

To understand how data-driven practices in social welfare are co-produced and citizens' data are reused, we conducted an ethnographic study with a municipal rehabilitation team that administers the resource development program.

A vulnerable citizen applying for a resource development program is typically registered across several governmental services, each producing data about the individual citizen's progress and the kinds of support and benefits provided. Some of these data are saved to a Common IT Database. There are many producers of data about the vulnerable citizen, including the municipal caseworkers in the job placement program, but also doctors, counselors, and child support, to mention a few. All of these points of entry use a personal identifier that makes it possible to use and reuse data across settings.

In 2013, when the resource development program began, the shared responsibility for this new welfare scheme across regions (responsible for healthcare) and municipalities (responsible for social welfare) produced a new need for coordinated and safe communication. The local government procured a cross-organizational information system to support casework and the use and reuse of data that were considered relevant to citizens' application for a resource development program. For example, the system supports a caseworker's request of specific information in preconfigured forms about the citizen's health and personal issues, which can then 'travel' from primary and secondary care providers into the setting of resource development programs.

In addition, representatives from agencies across the rehabilitation team use their 'local' municipal caseworker systems to retrieve archival data and ensure that a citizen's application is coordinated in relation to other types of support and public services. The main technical infrastructure is illustrated in Figure 1, which shows how caseworkers draw on a range of other platforms and systems to assemble the citizen's application in accordance with the formal steps and requirements.

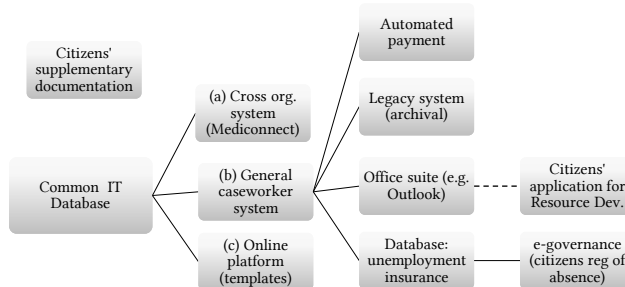


Fig. 1. Technical infrastructure related to the application for a resource development program.

### 3.3 The Case Study

The paper presents findings from 7 months of ethnographic fieldwork in one of the largest municipalities of Denmark, and took place from March 2015 to September 2016. The study currently counts 89 hours of observations. The initial focus of the study was the general setup of social welfare and how it facilitates caseworkers' practice. Later, our focus shifted towards the processes around assembling citizens' applications for a resource development program and



the caseworker-citizen interaction. These processes are particularly interesting, we found, for understanding how citizens' personal data are used and reused across governmental institutions and how the contextualizing of data takes place.

The study relied on observations of the citizens' first meeting preparing the application for a resource development program (N=3) and the citizens' meeting with the rehabilitation team (N=5) besides the general activities of caseworkers (office meetings etc.). In total, we conducted 19 interviews (in situ and semi-structured) with: caseworkers (N=4) legal consultant (N=1) IT specialist (N=1) secretariat to the rehabilitation team (N=3) rehabilitation team members from other agencies (N=4) lead consultant (N=1) management (N=3) guards (N=1) doctor (N=1).

Recruitment followed a random sampling of citizens, observing the same group of caseworkers and their meetings with different citizens. Citizens differed in terms of, for example, gender and age but they were all struggling with serious health and personal issues. For example, we encountered individuals who had experienced different kinds of serious injury (e.g. a car accident) that led to long-term unemployment. Others suffered from permanent mental disorders (e.g. anxiety and autism) that prevented them from working. Other individuals in our study were no longer capable of doing demanding physical work due to their older age. Such citizens typically are the most vulnerable and disenfranchised. They struggle with mental health challenges, addiction, and disability. In these cases, the goal of the resource development program is not simply to care for these citizens' basic needs, but to return them to some form of 'productive' contribution to society.

We typically scheduled observations 2 days in a row, where the first author participated in meetings with 1-2 citizens and the associated preparation of a case. All caseworkers in the selected cases were experienced and worked in social welfare for several years. Ethnographic notes taken during meeting with caseworkers and citizens were transcribed shortly after conducting the observational studies.

We followed an iterative approach of collecting data and identifying themes that guided the next round of data collection and synthesizing [39], focusing in particular on the everyday conflicts [4] that are characteristic of service provision in social welfare and thus important for the design of technologies for this setting.

In the data collection and analysis, we elected not to report sensitive individual cases in order to give vulnerable citizens the benefit of the doubt in terms of their permission and consent, e.g., in cases of controversial diagnoses. Instead, data on various cases are assembled into the single persona of 'Fatima', introduced in more detail in the analysis. This decision to let the persona drive our analysis and findings was chosen to move through the complex decision-making processes of social welfare – while taking citizens' anonymity seriously.

An application regarding research ethics was approved by the Danish Data Protection Agency. Furthermore, the study of vulnerable citizens implied extra consideration in terms of research ethics, thus:

- Citizens involved in the study were asked permission whenever the field researcher observed their meetings with caseworkers.
- A single citizen requested by the end of a meeting that we refrained from using the data and no recordings or notes are kept from this meeting.
- A contract of professional secrecy was signed by the field researcher with the job placement agency, of which the rehabilitation team is an organizational and legal part

## 4 ANALYSIS: CITIZEN-CASEWORKER COLLABORATION AROUND THE ASSEMBLING OF THE CASE

We present the analysis through the narrative of our persona ‘Fatima’ (amalgamated), and the process of assembling her case. Through the persona of Fatima, we explore vulnerable citizens’ strategies to exercise authority and personal autonomy in the application process. Strategies varied in practice from case to case; however, they shared important factors such as the importance of bringing in support persons and making sure that the caseworker had access to supplementary accounts of their personal issues and situation. Fatima is a 45-year-old divorced woman with 3 young children she provides for. She first came to Denmark 15 years ago as a refugee, fleeing civil violence in her home country (and her violent relationship). The narrative of Fatima focuses on the interaction of the caseworker and citizen assembling the application for the rehabilitation team. In Fatima’s case, it is essential for the process that she tackles her anxiety and trauma so she can provide the requested information and attend the meeting with the caseworker to prepare her case for the rehabilitation team.

### 4.1 Scaffolding of the Application Process

Ensuring a case is sufficiently documented is the most significant task of caseworkers in the application process. When a case is rejected without review (desk-rejected), this means there remains doubts about whether the presented documentation was sufficient. In practice this means that a caseworker will request all documentation in any of the areas where competing interpretations of a citizen’s work ability might occur (e.g. medical diagnoses).

The caseworker prepares a case for approximately an hour before the meeting with the citizen. During this time, the caseworker has to get an idea of the citizen’s trajectory up until the point of applying for a resource development program. They do this based on the different information to which they have access (e.g. records of the different types of support and benefits citizens and their families received). Thus, the overall task of the caseworker is to figure out what it takes for the documentation to be considered sufficient before the citizen’s meeting with the rehabilitation team.

One issue that the caseworker has to consider is Fatima’s work ability. This had been tested prior to her application in the areas of cosmetics, care work, and floral design. She was sent to internships in these fields. The ‘tests’ are reported at the end of the internship in a work report. All of the work reports mention her anxiety and trauma from being a refugee and the problems this causes in relation to carrying out a particular job.

In the application process, caseworkers’ reuse of medical data is not the only important aspect in how a resource development program is assigned but nevertheless this is a significant theme in all of the cases that we observed. Approximately three types of medical documentation may be required for understanding the relevant health issues of a citizen:

- Copies of medical records documenting prior treatment
- Status from clinics and medical specialists of ongoing diagnosis and treatment
- Specialists’ statements if required under particular circumstances

Before this first meeting, Fatima was asked to return a form with all kinds of requested information on her education, prior jobs, health, and personal issues for assessing the right ‘match’ in terms of welfare schemes (a. resource development program b. subsidized flexi-job on reduced hours, or c. early pension). On this basis, the caseworker’s assumption is that a

resource development program is the most likely welfare scheme for Fatima as she fits the criteria of someone with serious personal and health issues and she reads through Fatima's case files with this in mind.

#### 4.2 Assembling of the Documentation

A personal counselor that has known Fatima for years accompanies Fatima to the meeting with the caseworker in the job placement because of her anxiety. It is a well-known phenomenon in other settings such as healthcare that patients are recommended to bring a support person in case they are, for example, anxious about the results of a test. The municipal caseworker carefully explains to Fatima that no decisions can be made in this initial meeting, where the caseworker and citizen simply assemble the case documentation.

Thus, the purpose of this initial meeting in the job placement agency, as later explained by the caseworker, is "to make sure that it is actually the citizen that responded to the letter that was sent in advance to the citizen as part of the application process" (In situ interview, caseworker May 5th 2015). For instance, did Fatima in fact fill out the form herself? And is she *motivated* for a resource development program? This is an informal criterion, the caseworker explains, in how they assess whether to assign a resource development program to a citizen.

The caseworker asks Fatima if she is having any personal or health issues other than the anxiety and trauma mentioned in the document. Fatima at first seems confused and starts looking in her handbag. She takes out a pile of business cards, some of them very old, and starts reading out the names, including both private medical specialists and specialists in public medical clinics. The caseworker takes notes and at the same time tries to crosscheck the names of medical specialists listed in the digital form in front of her that Fatima returned before the meeting.

As it turns out the form, although it is carefully filled out, is not sufficiently detailed for guiding the caseworker to relevant sites of information, as it becomes clear that Fatima has many more health issues than simply anxiety and trauma. For example, a specialist in gynecology is currently diagnosing her for other issues. Though it is not immediately clear how this is relevant to the assessment of Fatima's work ability (and considered as quite personal from Fatima's perspective), the caseworker insists on its relevance.

Fatima, on the other hand, is relying on her business cards to recall important information; thus, she is helping to identify all the sources of information that may be relevant for the application to proceed – or at least prove to the caseworker that she is motivated to provide this additional information.

The caseworker ultimately decides to request medical documentation from seven different private specialists and public medical clinics based on the pre-filled form and additional information Fatima provided in the meeting:

- Status from general practitioner
- Status from psychiatrist
- Status from the day clinic, orthopedic surgery
- Discharge letter from a psychiatric ward
- Status from gynecologist
- Status from an ophthalmology ward
- Status from a local health center

In addition to these documents, which are all digitally requested by the caseworker using the cross-organizational information system, the caseworker also requests an updated evaluation of her general level of functionality from the specialists working in occupational medicine.

At this point, it is critical that such additional information is properly 'datafied' for the setting of job placement before Fatima's application may be considered as complete. For example, the caseworker also explains to Fatima that she has to make an appointment with her general practitioner (GP) to get a digital statement of her general health. Fatima receives a note to remind her of this and the personal counselor confirms that she will be helping Fatima with the scheduling of an appointment with the GP. This example illustrates how patching together the infrastructure for a citizen's application for a resource development program takes much more work from all participants than the template form implies.

### 4.3 Steering Through Systemic Penalties

As the meeting continues, it becomes clear that Fatima's anxiety is her biggest struggle. Fatima's struggles with anxiety in relation to her caseworker meetings and how she makes sure to provide the required information to receive social welfare is a well-known phenomenon in the job placement service. When we asked caseworkers to explore the differences in citizens' mindsets, they all pointed to how anxiety is interdependent with them not knowing the course of actions in their case. It takes weeks before all medical information has been received and digitally processed so the rehabilitation team can proceed with Fatima's case. And, this lag time is a huge personal challenge as her counselor points out in the meeting, further triggering Fatima's anxiety.

At this meeting, the caseworker is aware that Fatima has an attorney, which is not unusual for citizens with immigrant backgrounds, the caseworker later explains to us. Fatima's personal attorney advised her not to sign anything until he approves it. The caseworker stops typing as she receives this information and explains that they cannot proceed with the request of relevant documentation without Fatima's consent. After a few minutes they agree that the personal counselor takes a picture of the consent form with Fatima's smartphone and sends it to the attorney for his approval, so that the application can proceed. Prolonging the case management to make sure the attorney had time to review the consent form could set Fatima back in her recovery. Thus, Fatima has to negotiate complex tradeoffs among ensuring her own rights, complying with process requirements, and getting timely access to resource support, and all from a position of vulnerability and anxiety. Adding to the complexity, it is not clear that a citizen can actually refuse to give their consent: The caseworker cannot get to specific types of documentation (e.g. copies of medical records) without a citizen's consent. Restricted consent from the citizen may be interpreted as lack of motivation. It can also result in 'process damage' because missing information is grounds for rejecting the application without review. In this case, the process of case management would be prolonged if Fatima had not signed the consent form in the meeting.

As Fatima's personal data from other settings (e.g. healthcare) moves into the application case material, a different set of rules in terms of how they may be shared come to apply. For example, it allows the caseworker to use and reuse medical records in relation to the assessment of Fatima's work ability and if she is meeting regulatory requirements on 'availability' in return for receiving social welfare. Thus, it makes good sense why Fatima takes advantage of the expertise of her attorney and personal counselor to steer through the risk of penalties - while tackling her struggles particularly with anxiety if the application process is prolonged.

#### 4.4 Supplementary Accounts to Retain Personal Autonomy

Since a resource development program can last for up to 5 years and be renewed 3 times, the assignment of this program to a citizen has long-term implications. From Fatima's perspective, retaining some personal autonomy in the application process becomes critical in order to shape it in accordance with her idea of the type of support she thinks will be best.

Because Fatima's prior application had been desk-rejected, her general practitioner (GP) agreed to write an additional letter of support. The GP's letter (different from the formal GP status) states in detail why the GP, from a medical point of view, does not recommend a resource development program. This is in direct contrast to the caseworkers' assessment.

Fatima's anxiety is related to traumas from when she fled her home country and, in this case, the GP argues, it is essential that Fatima be allowed to move on. The letter supports Fatima's interest in a different welfare scheme, 'flexi job', which is basically a subsidized job on reduced hours. Within the scheme of a flexi-job she is not forced to 're-live' her trauma by being forced to proceed with mentoring and therapy, which is often prescribed as part of a resource development program.

As the rehabilitation team later became involved in Fatima's case, the GPs supplementary account was not found to be sufficient in terms of granting Fatima a flexi-job. Instead, the rehabilitation team (like the caseworker that prepared Fatima's case) decided that Fatima would benefit from a resource development program, including access to a therapist/ and or mentor, thus going directly against the GP's advice. The rehabilitation team argues that a resource development program would grant Fatima the possibility of getting some more help at home, which is important for the overall welfare of her 3 children.

As conflicts often are part of the application process, citizens sometimes co-opt technology such as their smart phone as another strategy to obtain their own data about the process. Citizens therefore sometimes request permission to record the meeting on their smartphones. Many caseworkers feel reluctant but agree to it if it is known to all parties present that a meeting is being recorded. As with Fatima, her smartphone is part of how she engages in the assembling for the case management process.

The caseworkers make a note in the record whenever a citizen expresses that they wish to record a meeting. This means that the next caseworker can identify the request and prepare in advance to downscale potential conflict and reduce stress upon colleagues so that they are not recorded when unaware.

A caseworker explains: *"I have nothing to fear. And the citizen is welcome to record a meeting. Then I would simply say to her that I know you previously expressed that you wish to record meetings and I think that is fine. However, I will have to know if you record a meeting because then I think that we should both do that"* (In situ interview, caseworker May 5th 2015). While citizens also have the right to a copy of the summary after their meeting with a caseworker, this particularly vulnerable group of citizens has few resources and a smartphone recording is sometimes experienced as a better option to help make sense of the process.

Here, the opportunity to listen to recordings of a meeting may provide an alternative source of citizen-initiated support in the process of case management. However, caseworkers' unease with recording is a challenge that could interfere with case management.

## 5 DISCUSSION: TREADING THE PATH TO DATA-DRIVEN PUBLIC SERVICES FROM THE PERSPECTIVE OF CIVIC PARTICIPATION

Through the persona of Fatima, we have empirically explored the citizen-caseworker interaction in the application process, focusing on the first meeting between a citizen and the caseworker and how they cooperate around the assembly of the application for social welfare. The process presented here underlines the importance of looking at data reuse across settings [9, 51] and how those data shape the caseworker-citizen interaction. This case raises questions related to the prior work of Karasti & Baker and others on how we design to enable citizens “[to grow] their own ‘smaller’ information infrastructures” [36] that are compatible with the larger and more stable infrastructures of public services [10, 11, 19, 69]. We find that vulnerable citizens engage in infrastructuring-like practices, which we develop here as ‘private resourcing’, when patching together the information infrastructure relevant for documenting their personal- and health-issues.

As noted in the opening sections of the paper, we use the term infrastructure to describe the socio-technical relations that make up the network of resources that enable (or hinder) action on the part of citizens. The citizens’ private resourcing (e.g. bringing supplementary accounts into the application process) operates at a more temporary and intimate extent, but nonetheless complements the formal processes of the social service providers, acting as a mechanism that allows citizens to give authority to their case and exercise their personal autonomy.

Through the empirically grounded persona of Fatima, we see how the personal resources of the citizen are worked into the formal processes around the application for a resource development program. They do this in a way that parallels infrastructuring [21]: the information artifacts and personal connections enable the citizen and the caseworker to take act in new ways to support the overall process.

An obvious difference between citizens’ resourcing and the broader notion of infrastructuring is scope: citizens’ use of technology in our case is not stabilizing, nor does it extend beyond their immediate case. Private resourcing is tightly coupled to the individual and transpires in relation to larger external processes and structures. The caseworker remains important for setting up a space for citizens’ private resourcing, as they are the point of translation that turns personal data into legible institutionalized data, and back again.

It then follows that we need to carefully consider how existing and new data changes the interaction between caseworker and citizen so that new uses of data will not introduce an extra burden on the individual citizen.

### 5.1 Setting Up Caseworker-Citizen Interaction as a Space for Contextualizing Data

Citizens’ strategies of private resourcing often relied on the combination of simple technologies such as their smartphone and the connection those technologies provided to professional support-persons. These socio-technical interactions enabled citizens to tap into the authority lent by support persons by providing archival functions, such as a doctor’s supplementary account, document-sharing applications like sending a photo to their attorney of a signed consent form, and memo applications that enabled the citizens to record of caseworker meetings so they could return to details they might have otherwise missed.

Whereas the simple technology of a smartphone cannot change whether a citizen has any support persons (as Fatima had), nor can it directly reduce the burden on the individual citizen per se, it can help mobilize support of their case. However, these strategies of personal

resourcing still depend on the translation work of the caseworker, and remain subject to the challenges of working across the deeply asymmetrical relationships of lay citizenry and appointed caseworkers.

Citizens strategies, like using photo and memo applications, may not seem like a structured or coordinated effort, but together they form important moments and opportunities for contextualizing the reuse of citizens' data. This is similar to how Ackerman and Halverson describe contextualization as more than data capture [1]. In their studies of database use, Ackerman and Halverson show how contextualization depends upon knowledge, and knowledge is 'knowing' where to retrieve the needed information. This in turn is the result of working with people who have expertise on the particular topic (Ibid).

Caseworker-citizen interaction in this setting is complex, not simply due to the 'people-factor' and the differences between citizens [49]. Thus, within the social service provision described in our study, there is an inherent tension between kinds of topical expertise: caseworkers and citizens have inherently different foci, where one is attending to the government service costs and the other is attending to their individual needs and concerns [10, 11]. The contextual criteria for each can be at odds with each other and often the burden of contesting the gap between falls to the citizen.

We learn from Fatima's case that there are very different forms of 'knowing' and 'expertise'. In the setting of social welfare, it is not clear whose knowing or expertise carries weight. The supplementary account of the GP helps Fatima in raising this issue to the agenda; though, in the end she is not successful in convincing the caseworker that a 'flexi-job' is in fact best solution for her. Providing citizens like Fatima with the opportunity to mobilize whatever resources they can in order to engage with data that rolls-up for oversight and policy development is critical, as datafication in governmental services increases.

What is clear from our study is that personal data may (still) be interpreted differently across settings as we design systems for more integration. Prior studies point to how reuse of data for new purposes, unanticipated when the data is first collected, is becoming an integrated part of healthcare practice [57, 58]. Pine et al. demonstrate how information infrastructures shape how personal data are turned into abstractions and permit certain action: data – and its attendant processes of measurement, database production, stabilization, curation, maintenance and use – reproduce knowledge systems and culturally-based assumptions [Ibid p. 1]. This type of tension, also described by Volda et al. in a setting similar to ours [68], becomes more fraught when the means of making both systemic and individual decisions becomes data-driven.

It will be difficult for the citizen to understand or contest data, its context of collection, or its context of use if all they see is the application form. Likewise, we know from studies of datafication and accountability in professional work settings that individuals experience the same type of difficulty accounting for data as they are reinterpreted across time, place, and people [26, 42]. Our study indicates that it becomes even more urgent as we transition to data-driven decisions on access to social welfare that human caseworkers are present to intervene or even understand when procedurally generated outcomes go awry [16].

## 5.2 Supplementary Accounts Made Legible to the Formal Systems

So how can we think through citizens' private resourcing? For the purpose of design, how do such practices, when the scale is smaller, translate into concrete suggestions supporting citizens while retaining important qualities of professional work? How would this civic participation at

scale look in a public service setting currently seeking to integrate new data-centric practices for assessing needs and delivering services?

The private resourcing practices we observed show how supplementary accounts from citizens could be integrated into the processes of social welfare such that their experiences and social context become legible to the system that caseworkers rely on. Here it is critical to understand how different classes of systems, characterized by the different role of the citizen, might connect and inform each other when thinking through digitization of public services. In the first class of information systems for service provision, government officials (caseworkers) do the work of collecting and acting on information about each individual. In the second class for support of regulatory regimes, data aggregation rolls-up for oversight and policy development.

Our case illustrates how even the more vulnerable citizens work creatively with and across what Vertesi [70] describes as ‘infrastructural seams’. The missing information on Fatima’s health, for instance, becomes an opportunity for her to take back some of the control of her application for social welfare. Thus, in the seams of infrastructures [Ibid], citizens are not necessarily hemmed in or incapacitated by multiple infrastructural commitments, but instead they work artfully to align them to be concordant with the social welfare processes while ensuring at least some background of regulation within those formal processes.

In our case, the formal information infrastructure allows the GP to enter information on the citizen’s general health through the predefined digital form. In this sense, the digital form is a concrete example of the politics of infrastructures, similar to the findings of Bopp et al., shaping the kinds of data that becomes legible to the formal information systems [9, 57]. However, for other types of health data, the caseworker relies on the citizen. In this way, the seams of the information infrastructures in social welfare give the citizen a role to play in the reuse of data.

Our findings emphasize the continued need to think through authority and personal autonomy as governments introduce datafication into public services. Instead of prioritizing the service delivery side only, filtering and decontextualizing the data being assembled, consideration of citizens’ agency is key. This leaves no place for rendering citizens as passive mediators of relevant data sources as the citizens become permission conduits to data and their own opinions or perspectives.

To sum up, the case of social welfare can help us understand how citizens take on an active role in co-producing their application for social welfare. These may not be particularly popular measures from the perspective of a caseworker when, for example, the citizen records a meeting or involves an attorney. The case here shows that citizens - especially vulnerable citizens where the outcomes of the process are so critically important - want agency and will pro-actively create agency through a variety of people, supplementary data, and technical resources to bolster their case.

## 6 CONCLUSION

The questions that we examine in this paper are: How is datafication – and data – in social welfare shaping the citizen-government interaction? Given this datafication, what are the citizens’ roles in assembling their case and how do they complement the formal application process to give authority to their case and exercise their personal autonomy?

We explored these questions in an ethnographic study of case management, introducing a formal role for the citizen as a co-producer of public services. Co-production is increasingly used as a strategy to innovate public service and citizen-caseworker collaboration. These



settings (social welfare) are important for their broad impact across society and because they put into greater relief the challenges of working across the deeply asymmetrical relationships of lay citizenry and appointed officials.

The application process we examined is an example of a new class of public service processes that are increasingly using personal data to guide programmatic decisions: new models for action, integrating data from several sources are currently being developed and tested as part of a larger research project, as mentioned earlier. To avoid privileging only the view of service provider and under-specifying the role of the citizen, the research project is focusing on the work involved from both sides. Our goal here is to inform the design of these new models with a better understanding of citizens' preferred strategies for exercise of authority and personal autonomy as decision-making in the public services is increasingly based in data.

Consequently, the contribution of this paper is, first, the empirical characterization of the citizen-caseworker interaction in the application process. Second, we discuss how citizens' private resourcing complements the formal application process as strategies allowing citizens to give authority to their case and exercise personal autonomy. We suggest 'private resourcing' in citizen-caseworker interaction as an analytic frame that describes how recipients of care integrated both social support from family and friends and support through evidence they created and curated with support of their attorney, doctor, etc. As we think through design, private resourcing draws attention to the fact that the data-driven movement in public services is usually built on data *about* citizens, which is in practice often hard to access and contest by those same citizens and that citizens want a greater role in this.

Designing for citizens' private resourcing can bring about a more symmetric relationship between system and citizen. The private resourcing practices we observed show how supplementary data from citizens could be integrated into a process such that their experiences and social context are legible to the systems that caseworkers rely on. This in turn has policy and technology design implications as we introduce data-driven public services, if we are to come closer to the goal of making public services truly valuable to the citizen.

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## REFERENCES

- [1] Mark S. Ackerman & Christine Halverson. 1998. Considering an organization's memory. In *Proceedings of the ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)*, 39-48.
- [2] Antonella De Angeli, Silvia Bordin & María Menéndez Blanco. 2014. Infrastructuring participatory development in information technology. In *Proceedings of the 13th Participatory Design Conference (PDC): Research Papers*, 11-20.
- [3] Mariam Asad, Christopher A. Le Dantec, Becky Nielsen, & Kate Diedrick. 2017. Creating a sociotechnical API:
- [4] Designing city scale community engagement. In *Proceedings of the ACM Conference on Human Factors in*
- [5] *Computing Systems (CHI)*, 2295–2306.

- [6] Ellen Balka, Christine Reidl & Ina Wagner. 2007. Using fieldwork in analyzing ethical issues related to IT in health care. *Studies in Health Technology and Informatics*, 237-241.
- [7] Jørgen Bansler, Erling Havn, Troels Mønsted, Kjeld Schmidt and Jesper Hastrup Svendsen. 2013. Physicians' progress notes. In *Proceedings of the European Conference on Computer-Supported Cooperative Work (ECSCW)*, 123-142.
- [8] Eevi E. Beck. 2002. P for political: Participation is not enough. *Scandinavian Journal of Information Systems* 14(1), 77-92.
- [9] Thomas Binder, Gioglio De Michelis, Pelle Ehn, Giulio Jacucci, Per Linde & Ina Wagner. 2011. *Design Things*. MIT Press.
- [10] Erling Björgvinsson, Pelle Ehn & Per-Anders Hillgren. 2010. Participatory design and "democratizing innovation". In *Proceedings of the 11th Participatory Design Conference (PDC)*, 41-50.
- [11] Chris Bopp, Ellie Harmon & Amy Volda. 2017. Disempowered by data: Nonprofits, social enterprises, and the consequences of data-driven work. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, 3608-3619.
- [12] Nikolaj Gandrup Borchorst & Susanne Bødker. 2011. "You probably shouldn't give them too much information" - Supporting Citizen-Government Collaboration. In *Proceedings of the European Conference on Computer-Supported Cooperative Work (ECSCW)*, 173-192.
- [13] Nikolaj Gandrup Borchorst, Brenda McPhail, Karen Lousie Smith, Joseph Ferenbok & Andrew Clement. 2012. Bridging identity gaps- supporting identity performance in citizen service encounters. *Computer Supported Cooperative Work: An International Journal (JCSCW)*, 21(6), 555-590.
- [14] Alan Borning, Batya Friedman, Janet Davis, & Peyina Lin. 2005. Informing public deliberation: Value sensitive design of indicators for a large-scale urban simulation. In *Proceedings of the European Conference on Computer-Supported Cooperative Work (ECSCW)*, 449-468.
- [15] Nina Boulus-Rødje. 2018. In search for the perfect pathway: Supporting knowledge work of welfare workers. *Computer Supported Cooperative Work: An International Journal (JCSCW)*, 27(3-6), 841-874.
- [16] Geoffrey C. Bowker & Susan Leigh Star. 1999. *Sorting Things Out: Classification and its Consequences*. Cambridge, MIT Press.
- [17] Lars Rune Christensen & Thomas Hildebrandt. 2017. Modelling cooperative work at a medical department. *Proceedings of the 8th Conference on Communities and Technologies*, 46-55.
- [18] David Danks & Alex John London. 2017. Algorithmic bias in autonomous systems. In *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence*, 4691-4697.
- [19] Christopher A. Le Dantec & Keith Edwards. 2008. The view from the trenches: Organization, power, and technology at two nonprofit homeless outreach centers. In *Proceedings of the ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)*, 589-598.
- [20] Christopher A. Le Dantec & Keith Edwards. 2010. Across boundaries of influence and accountability: The multiple scales of public sector information systems. In *Proceeding of the ACM Conference on Human Factors in Computing Systems (CHI)*, 113-122.
- [21] Christopher A. Le Dantec. 2012. Participation and publics: Supporting community engagement. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, 1351-1360.
- [22] Christopher A. Le Dantec, Caroline Appleton, Mariam Asad, Robert Rosenberger & Kari E. Watkins. 2016. Advocating through data: Community visibilities in crowdsourced cycling data. In A. Golub, M. L. Hoffmann, A. E. Lugo, G. F. Sandoval (Eds). *Bicycle Justice and Urban Transformation: Biking For All?* Routledge.
- [23] Christopher A. Le Dantec. 2016. *Designing Publics*. MIT Press, Chapter 5.
- [24] Jose Van Dijck. 2014. Datafication, dataism and dataveillance: Big Data between scientific paradigm and ideology. *Surveillance and Society*, 12(2), 197-208.
- [25] Lynn Dombrowski, Adriana Alvarado Garcia, Jessica Despard. 2017. Low-wage precarious workers' sociotechnical practices working towards addressing wage theft. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, 4585-4598.
- [26] Paul Dourish & Edgar Gómez Cruz. 2018. Datafication and data fiction. Narrating data and narrating with data. *Big Data & Society*, July-December 2018, 1-10.
- [27] Pelle Ehn. 2008. Participation in design things. In *Proceedings of the Tenth Anniversary Conference on Participatory Design (PDC)*, 92-101.
- [28] Virginia Eubanks. 2017. *Automating Inequality: How High-Tech Tools Profile, Police and Punish the Poor*. St. Martin's Press, NY.
- [29] Geraldine Fitzpatrick & Gunnar Ellingsen. 2013. A review of 25 years of CSCW research in healthcare: Contributions, challenges and future agendas. *Computer Supported Cooperative Work: The Journal of Collaborative Computing and Work Practices (JCSCW)*, 22(4-6), CSCW Jubilee Issue.

- [31] Jeremy Gilbert. 2013. *Common Ground*. Pluto Press.
- [32] John Gilliom. 2001. *Overseers of the Poor. Surveillance, Resistance, and the Limits of Privacy*. The University of Chicago Press, Chicago and London.
- [33] Keith N. Hampton. 2010. Grieving for a lost network: Collective action in a wired suburb. *The Information Society*, 19(5), 417–428.
- [34] Karim Jabbar & Pernille Bjørn. 2017. Growing the blockchain information infrastructure. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, 6487–6498.
- [35] Karim Jabbar & Pernille Bjørn. 2018. Infrastructural grind: Introducing blockchain technology in the shipping domain. In *Proceedings of the 2018 ACM Conference on Supporting Groupwork*, 297–308.
- [36] Linda A. Jackson, Gretchen Barbatis, Frank Biocca, Yong Zhao, Alexander von Eye & Hiram Fitzgerald. 2004. HomeNetToo: Home internet use in low-income families: Is access to the internet enough? In E. P. Bucy & J. E. Newhagen (Eds.), *Media Access: Social and Psychological Dimensions of New Technology Use*. Mahwah, NJ.
- [37] Steven J. Jackson & Sarah Barbrow. 2015. Standards and/as Innovation: Protocols, creativity, and interactive systemsdevelopment in ecology. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, 1769–1778.
- [38] Tom Jenkins, Christopher A. Le Dantec, Carl A. DiSalvo, Thomas Lodato & Mariam Asad. 2016. Object-Oriented Publics. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, 827–839.
- [39] Helena Karasti & Karen S. Baker. 2008. Community design: Growing one's own information infrastructure. In *Proceedings of the Tenth Conference on Participatory Design (PDC)*, 217–220.
- [40] Elizabeth Kazianas, Mark S. Ackerman, Silvia Lindtner & Joyce M. Lee. 2017. Caring through data: Attending to the social and emotional experiences of health datafication. In *Proceedings of the ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW)*, 2260–2272.
- [41] Guang-Hoon Kim, Silvana Trimi & Ji-Hyong Chung. 2014. Big Data applications in the government sector. *Communications of the ACM*, 57(3), 78–85
- [42] Heinz K. Klein & Michael D. Myers. 1999. A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS Quarterly*, 23(1), 67–93.
- [43] Matthias Korn & Amy Vaida. 2015. Creating friction: Infrastructuring civic engagement in everyday life. In *Proceedings of The Fifth Decennial Aarhus Conference on Critical Alternatives*, 145–156.
- [44] Travis Kriplean, Jonathan Morgan, Deen Freelon, Alan Borning & Lance Bennett. 2012. Supporting reflective public thought with considerit. In *Proceedings of the ACM Conference on Computer Supported Cooperative Work (CSCW)*, 265–274.
- [45] Kristian Helbo Kristiansen, Mathias A. Valeur-Møller, Lynn Dombrowski & Naja L. Holten Møller. 2018. Accountability in the blue-collar data-driven workplace. In *Proceedings of the Conference on Human Factors in Computing Systems (CHI)*, paper 332.
- [46] Charlotte P. Lee, Paul Dourish & Gloria Mark. 2006. The human infrastructure of cyberinfrastructure. In *Proceedings of the ACM Conference on Computer Supported Cooperative Work (CSCW)*, 299–308.
- [47] Charlotte P. Lee, Matthew J. Bietz & Alex Thayer. 2010. Research-driven stakeholders in cyberinfrastructure use and development. In W. W. Smari and W. K. McQuay (eds.): *CTS 2010: International Symposium on Collaborative Technologies and Systems (CTS)*, 163–172.
- [48] Charlotte P. Lee and Kjeld Schmidt. 2018. A bridge too far? Critical remarks on the concept of “infrastructure” in CSCW and IS. In Volker Wulf, Volkmar Pipek, Dave Randall, Markus Rohde, Kjeld Schmidt & Gunnar Stevens (Eds), *Socio-Informatics: A practice-based Perspective on the Design and Use of IT Artifacts*, Oxford University Press, Chapter 5.
- [49] Michael Lipsky. 1980. *Toward a Theory of Street-level Bureaucracy*. New York: Russell Sage.
- [50] Eric Monteiro, Neil Pollock, Ole Hanseth & Robin Williams. 2012. From artefacts to infrastructures. *Computer Supported Cooperative Work: An International Journal (JCSCW)*, 22(4-6), 1-33.
- [51] Eric Monteiro & Ole Hanseth. 1996. Social shaping of information infrastructure: On being specific about the technology. In W.J. Orlikowski, G. Walsham, M. Jones, & J.I. DeGross (Eds.), *Information technology and changes in organizational work*, 325–343.
- [52] Naja Holten Møller and Pernille Bjørn. 2011. Layers in sorting practices: Sorting out patients with potential cancer. *Computer Supported Cooperative Work: An International Journal (JCSCW)*, 20, 123–153.
- [53] Naja Holten Møller. 2013. Achieving continuity of care: A study of the challenges in a Danish and US hospital department. In *Proceedings of the European Conference on Computer Supported Cooperative Work (ECSCW)*, 221–240.

- [54] Naja Holten Møller and Klaus Bruhn Jensen. 2016. Making sense of medical records in a non-medical practice. *Position paper presented at the SIGCHI Conference on Human Factors in Computing Systems (CHI)* <https://ethicalencountershci.com/chi-2016/position-papers-chi-2016/>
- [55] Naja Holten Møller, Pernille Bjørn, Jonas Christopher Villumsen, Tine C. Hansen Hancock, Toshimitsu Aritake, Shigeyuki Tani. 2017. Data tracking in search of workflows. In *Proceedings of the ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW)*, 2153-2165.
- [56] Naja Holten Møller. 2018. The future of clerical work is precarious. *ACM Interactions*, July-August 2018, 75-78.
- [57] Troels Mønsted, Madhu C. Reddy and Jørgen P. Bansler. 2011. The use of narratives in medical work: A field study of physician-patient consultations. In *Proceedings of the European Conference on Computer-Supported Cooperative Work (ECSCW)*, 81-100.
- [58] Nation Alliance to End Homelessness. (n.d.). *Homeless Assistance and the Neighborhood Stabilization Program*. Nation Alliance to End Homelessness.
- [59] Robert Nickerson, Mark Austreich, Jamie Eng. 2014. Mobile technology and smartphone apps: A Diffusion of innovations analysis. In *Proceedings of the Twentieth Americas Conference on Information Systems (AMCIS)*, 1-12.
- [60] Kathleen H.Pine, Christine Wolf & MelissaMazmanian. 2016. The work of reuse: Birth certificate data and healthcare accountability measurements. In *Proceedings of the IConference*.
- [61] Kathleen H.Pine, Claus Bossen, Yunan Chen, Gunnar Ellingsen, Miria Grissot, Melissa Mazmanian & Naja Holten Møller. 2018. Data work in healthcare. Challenges for patients, clinicians and administrators. *Companion of the ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW)*, 433-439.
- [62] Randal Pinkett & Richard O'Bryant. 2003. Building community, empowerment and self-sufficiency. *Information, Communication & Society*, 6(2), 187-210.
- [63] Volkmar Pipek & Volker Wulf. 2009. Infrastructuring: Toward an integrated perspective on the design and use of information technology. *Journal of the Association for Information Systems*, 10(5), 447-473.
- [64] Irina Shklovski, Janet Vertesi, Emily Troshynski & Paul Dourish. 2009. The commodification of location: dynamics of power in location-based systems. In *Proceedings of the International Conference on Ubiquitous Computing (UbiComp)*, 11-20.
- [65] Susan Leigh Star & Karen Ruhleder. 1994. Steps towards an ecology of infrastructure: Complex problems in design and access for large-scale collaborative systems In *Proceedings of the ACM Conference on Computer Supported Cooperative Work (CSCW)*, 253-264.
- [66] Susan Leigh Star. 1999. The Ethnography of Infrastructure. *American Behavioral Scientist*, 43(3), 3777-391.
- [67] Sam Tsemberis, Leyla Gulcur & Maria Nakae. 2004. Housing first, consumer choice, and harm reduction for homeless individuals with a dual diagnosis. *American Journal of Public Health*, 94(4), 651-656.
- [68] The Danish Government. 2013. The National Reform Program 2013. [https://ec.europa.eu/info/sites/info/files/file\\_import/nrp2013\\_denmark\\_en\\_0.pdf](https://ec.europa.eu/info/sites/info/files/file_import/nrp2013_denmark_en_0.pdf)
- [69] Emily Troshynski, Charlotte P. Lee & Paul Dourish. 2008. Accountabilities of presence: Reframing location-based systems. In *proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, 487-496.
- [70] Amy Volda, Ellie Harmon & Ban Al-Ani. 2012. Bridging between organizations and the public: volunteer coordinators' uneasy relationship with social computing. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, 1967-1976,
- [71] Amy Volda, Lynn Dombrowski, Gillian R. Hayes & Melissa Mazmanian. 2014. Shared values/conflicting logics: working around e-government systems. In *Proceedings of the ACM conference on Human Factors in Computing Systems (CHI)*, 3583-3592.
- [72] Michael Veith, Kai Schubert & Volker Wolf. 2009. Fostering communities in urban multi-cultural neighbourhoods: Some methodological reflections. In M. Foth (Ed.), *Handbook of Research on Urban Informatics*. New York: Information Science Reference, 115-130.
- [73] Janet Vertesi. 2014. Seamful spaces. Heterogeneous infrastructures in interaction. *Science, Technology & Human Values*, 39(2), 264-284.
- [74] Jolien Vos, Kathrin Gerling, Conor Linehan, Aloysius N Siriwardena & Karen Windle. 2018. Understanding care navigation by older adults with multimorbidity: Mixed-methods study using social network and framework analyses. In *JMIR Aging* 1(2), e11054.
- [75] Lauren Wilcox, Dan Morris, Desney Tan & Justin Gatewood. 2010. Designing patient-centric information displays for hospitals. In *Proceedings of the ACM conference on Human Factors in Computing Systems (CHI)*, 2123-2132.
- [76] Jill P. Woelfer, Megan Wei-Man Yeung, Candice G. Erdmann & David G. Hendry. 2008. Value considerations in an information ecology: Printed materials, service providers and homeless young people. Presented at the ASIS&T Annual Meeting, Columbus, Ohio.

- [77] Jill P. Woelfer & David G Hendry. 2010. Homeless young people's experiences with information systems: Life and work in a community technology center. In *Proceedings of the ACM conference on Human Factors in Computing Systems (CHI)*, 1291–1300.
- [78] Jill P. Woelfer, Amy Iverson, David G. Hendry, Batya Friedman & Brian T. Gill. 2011. Improving the safety of homeless young people with mobile phones: Values, form and function. In *Proceedings of the ACM Conference Extended Abstracts on Human Factors in Computing Systems (CHI)*, 1707–1716.

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