Åbo Akademi

OPEN ACCESS

This is an electronic reprint of the original article. This reprint may differ from the original in pagination and typographic detail.

Unpacking the digitalisation of public services

Andersson, Christopher; Hallin, Anette; Ivory, Chris

Published in:
Government Information Quarterly

DOI:
10.1016/j.giq.2021.101662

Published: 20/12/2021

Document Version
Final published version

Document License
CC BY

Link to publication

Please cite the original version:
Andersson, C., Hallin, A., & Ivory, C. (2021). Unpacking the digitalisation of public services: Configuring work during automation in local government. *Government Information Quarterly*, *39*(1), Article 101662. https://doi.org/10.1016/j.giq.2021.101662

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

This document is downloaded from the Research Information Portal of ÅAU: 24. Apr. 2024

ARTICLE IN PRESS

Government Information Quarterly xxx (xxxx) xxx

Contents lists available at ScienceDirect

Government Information Quarterly

journal homepage: www.elsevier.com/locate/govinf

Unpacking the digitalisation of public services: Configuring work during automation in local government

Christoffer Andersson [a,*], Anette Hallin [a,b], Chris Ivory [c]

[a] School of Business, Society and Engineering, Mälardalen University, Sweden
[b] Faculty of Social Sciences, Business and Economics, Åbo Akademi University, Finland
[c] IMPact research centre, School of Business and Law, Anglia Ruskin University, Cambridge, UK

ARTICLE INFO

Keywords:
RPA
Robot process automation
Digitalisation
Configuring work
Automation
Automating
Algorithmisation
Public administration work
Social work

ABSTRACT

The digitalisation of public services involves not only the transformation of the relationship between public service providers and clients, but also the transformation of public administration work. While most studies of digitalisation of the public sector have focused on the practical outcomes for the quality of public services and the quality of public administration work, none have unpacked , or theorised, how these changes actually come about in practice. This paper fills this gap by drawing on a study of the in-house adaptation of a digital automation tool (an RPA) by a Swedish local authority. In the article, we pay attention to what we, inspired by Donna Haraway and Lucy Suchman, call 'configuring work', i.e. the weaving together of the affordances of the technology, materials, discourses, roles and power structures. The contribution of the paper is two-fold. First, the paper demonstrates empirically how the digitalisation of a public service took place through an emergent, relational process that involved both the social and the material. Second, by adopting the the idea of 'configuring work' and paying attention to the effects of this, we show that the digitalisation process was successively shaped by the particular vested interests, ethics, discourses and the algorithmic materialities that comprised it. This helps us discuss the reason for why, in extant literature, digitalisation threatens the professional autonomy of the public administrators as well as why it may reduce service quality. Finally, we suggest how some of these issues may be addressed in future research.

1. Introduction

Applying for public benefits has historically meant interacting with a trained professional human. Increasingly, though, applying for public benefits, means interacting with a digital interface and some sort of algorithm. That the digitalisation of public services is reshaping the work of front-line officers in public administration is widely acknowledged (Buffat, 2015; Cordella & Tempini, 2015; Petrakaki, 2018; Wirtz, Weyerer, & Geyer, 2019). That digitalisation can change the nature, content and quality of the service delivered; improving some aspects while reducing quality elsewhere, is also widely established (Lindgren, Madsen, Hofmann, & Melin, 2019; Seddon, 2008). The processes through which these transformations actually occur is howeverunder-researched. Technologies are not simply 'handed down' from vendors fully formed 'as if from heaven' (c.f. Suchman, 2000). Public organisations may purchase standard systems and adapt these to their needs, but the technologies are often also adapted in-house through processes in which the public administrators who are responsible for delivering the service and who later will use the technology, are directly involved.

Whereas previous studies of the digitalisation of the public sector have been concerned with the outcomes and impacts of implemented technologies (Vial, 2019) on service quality, skills, or the quality of public administration work, we focus here on the hitherto under-explored internal processes through which these outcomes are brought about; the stage where the digital solution is still being designed and assembled (Buffat, 2015; Yildiz, 2007). Our purpose is to unpack the process of digitalisation of public services by paying close attention to the interactions through which a digital automation solution is implemented and adapted to a local government organisation. In the paper we draw on an ethnographic case study of a project that aimed at implementing a digital automation solution in the work of processing applications for social benefits within the social care department of a Swedish municipality. This public administration work is performed by public administrators with an educational background in social work and the

* Corresponding author.
E-mail address: christoffer.andersson@mdh.se (C. Andersson).

https://doi.org/10.1016/j.giq.2021.101662
Received 26 January 2021; Received in revised form 5 October 2021; Accepted 4 December 2021
0740-624X/© 2021 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

case involved the project of implementing and adapting a robot-process-automation-technology (RPA).

Our approach is not simply to unpack or deconstruct the technology by examining its' impacts on public administration work, or the responses to it by public administrators, but to analyse in depth the stage where the technology is still being designed and assembled. Specifically, we do so by conceptualising the design and implementation-process of the RPA as *configuring work*, i.e. as work through which particular associations of meanings, practices and technology become assembled in such a way that the reality of the project is produced (Haraway, 1997; Suchman, 2012). By exploring in detail this open and flexible period during which public administration work is articulated and re-envisaged, and when the precise shape of the technology is yet to be determined, we unpack how technology and the organising of public administration work emerge as a consequence of their encounters with one another.

Our study shows that despite the process being participative, in that it involved the public administrators whose work was (partly) to be taken over by the digital automation solution, they were not able to resist what they saw as negative changes to their role or the future quality of the service. The case thus reveals an uneven negotiation between workers, managers, and technology. It shows, for example, how the 'inherent' nature of the software was constructed as being durable (non-negotiable), as needing to be executed as a linear set of instructionsand how this logic was deployed to justify the re-shaping and simplifying of work processes. Whereas previous research has argued that some work is resistant to codification and hence to digitalisation (e.g. Woodcock & Graham, 2019), we find that work can, in fact, be transformed through configuring work, as tasks are singled out and re-designed so that they *are* rendered codifiable. In other words, both work and the service are re-designed to fit the (supposed) limitations of the technology, not the other way around.

Our research points to the need for practitioners to pay close attention to this pre-implementation phase, to how the affordances and logic of digital systems are constructed in particular ways, to the limitations of participative service re-design and the role of managerial power, tropes and discourse, in order for digitalisation processes to not go awry.

Our paper is structured as follows. In the next section we give a brief review of the literature on how public work and services are impacted by digitalisation. The following section provides a theoretical framework for how we conceptualize the concurrent change of new technology and work. This is followed by an outline of our research approach and the methods used. We then present our case and the empirical findings and analysis. Finally, we discuss the findings and present our conclusions and contribution.

2. Impact of digitalisation on public services and public administration work

Digitalisation is transforming public services through the promise of delivering more efficient, more effective, and indeed more transparent services (Choi, 2016; Cordella & Tempini, 2015; Lindgren et al., 2019; Ranerup & Henriksen, 2019; Wihlborg, Larsson, & Hedström, 2016; Wirtz et al., 2019; Yildiz, 2007). Consequently, contemporary encounters between public administration and the public are increasingly mediated through digital interfaces and performed by algorithms in automated services (Boll, Rhodes, & Pors, 2015; Bovens & Zouridis, 2002; Reddick, 2005). In some settings, automated systems have entirely replaced what were previously human points of contact (Ranerup & Henriksen, 2019; Wihlborg et al., 2016), which means that not all public servants today can be assumed to be human (Lindgren et al., 2019).

Digitalisation, however, not only involves the transformation of the delivery of the service but also the transformation of the work that is still performed by public administrators (Busch, Henriksen, & Sæbø, 2018; Mergel, Edelmann, & Haug, 2019; Nygren, Axelsson, & Melin, 2013; Plesner, Justesen, & Glerup, 2018; Riemer & Peter, 2020). Although the space for professional autonomy and discretion for front line-officers tends to shrink as algorithms take over human decision making (Buffat, 2015; Busch & Henriksen, 2018; Larsson & Jacobsson, 2013), reduced discretion and increased transparency in front line decision making also reduces bias and enforces ethical values in service delivery (Busch & Henriksen, 2018). Furthermore, digitalisation may also alter accountability arrangements as core bureaucratic functions are mediated or performed by digital technology (Petrakaki, 2018).

It has however also been shown that with the digitalisation of public services, that because technology and work practices are so deeply intertwined, public administrators find themselves needing to engage in new tasks (Nygren et al., 2013). For example, case officers that previously interacted with the public to help them process their claims, increasingly find themselves helping the public with navigating and interpreting automated processes (Wihlborg et al., 2016). In sum: the – largely black-boxed – algorithms that are, in effect, delivering the services, change the way work is done and how decisions are made (Kolkman, 2020; Smith, Noorman, & Martin, 2010; Wirtz et al., 2019).

The dynamics of how these changes come about in practice is however not known, and there is thus a need to look more carefully at *how* the work of public administrators is transformed though the development and implementation of automated technologies. In doing so, two aspects of public administration work need to be acknowledged.

First, it should be noted that public administration work generally, while seeming repetitive and rules-based, can, in fact, be rather complex, involving a web of interlocking practices. As succinctly outlined by Wagenaar (2004 p. 644), the work of many public administrators involves:

"*hundreds of practical judgements, the everyday, taken-for-granted routines and practices, the explicit and tacit knowledge that is brought to bear on concrete situations, the moving about in the legal-moral environment of large administrative bureaucracies, the mastering of difficult human-emotional situations, the negotiating of discretionary space and the interactive give and take with colleagues that, taken together, make up everyday public administration.*"

Second, the practices that make up public administration work differ in different settings, cultures, and legal frameworks, which means that a particular digital technology may have varying degree of affinity with existing local practices. Digital technologies come with a logic of standardisation, rationalisation, efficiency, text-based communication and quantitative judgements (Petrakaki & Kornelakis, 2016); a logic that fits work that is purely calculative rather well. Other types of public sector work, for example social work, comes with a logic of situation-specific practices, care, knowledge creation, qualitative judgements, and involves the careful and slow interaction with citizens, that embody, and to some extent negotiate, the formal rules of the bureaucracy (Laurent, 2008; Wagenaar, 2004). This makes public administration work performed in a setting of social care services a particularly interesting case when it comes to better understand how the digitalisation of public services come about. It also makes digital automation, as a form of digitalisation, particularly interesting, since it involves the substituting of humans with digital technology, rather than just augmenting human labour (Lacity & Willcocks, 2018).

3. Configuring work as an analytical lens for understanding digitalisation

For any type of work to be automated, or indeed digitalised, it must at some point be represented visually in a way that is conducive to translation into algorithmic instructions for a computer. Hence, the digitalisation and automating of work requires a certain textualization and abstraction of previously embodied and situated knowledge (Zuboff, 1988). The more complex and opaque the work, the more there is a requirement for those doing the work to provide input into the design process. Software itself is also perhaps unique amongst machines in the

degree to which its design is open to participative design processes. Algorithms are what makes it possible to put structures of symbolic logic into motion (Finn, 2017) and computer programs – the machine code itself – is built from logic algorithms (Dourish, 2016) that are easy to represent visually and easy, in principle at least, to alter (Orlikowski, 2000). Algorithms are themselves also designed step by step, often using flow diagrams to capture work processes and then 'wire frames' to organise the system design. These steps, the logic of the algorithm, is recognisable as a representation of work practices and accessible for discussion by the workers themselves – making participation in the detail of algorithmic design possible. It is this collaborative production of algorithms that forms the point of entry for our data collection.

To allow for a close scrutiny of how the process of the adaptation of a digital automation technology emerged, we build on a body of work that treats categories such as 'social' and 'material' not as à priori categories, but as emergent in practice, coming about through relational processes (Gherardi, 2016; Orlikowski & Scott, 2008). In particular, we use the notion of *configuring work* as an analytical lens to examine how the actions of individuals, abstract figures and representations, and technological artefacts together and in a dynamic way perform and (re) configure each other to instantiate and constitute a particular, temporary, version of organisational reality (Mazmanian, Cohn, & Dourish, 2014; Suchman, 2012).

The concept of configuring work builds on Donna Haraway's conception of *figurations*. Figurations are "tropes of language, verbal or visual, that organise interpretative practice" (Haraway, 1997, p. 11). Figurations are representational forms that draw attention to particular features of a domain and imply particular associations of meaning and practices by reproducing conventions of the figured practices and creating abstractions that are the focus of discourses (Haraway, 1997; Mazmanian et al., 2014). These representations may be maps, numbers on a screen, forms and shapes or pictures, but they play an active role in constructing organisational reality (cf. Pollock & D'Adderio, 2012). In the production of algorithms, such visualisations may come in the form of wire-frame diagrams showing the flow of information and points of calculation. Before that, they may be represented as clusters of post-it-notes on a white board connected by lines drawn by hand. We are mostly interested in what happens when these figurations are created and negotiated; the way they form a space in which an, as-of-yet, unformed technology meets the organising of work, in a flexible and pliable state where both are figured together, i.e., *con*figured. Exploring processes of configuration, that is, configuring, is thus a way of looking at how sociomaterial assemblages come into being and understanding how different elements shape digital technology. As Lucy Suchman (2012, p. 57) puts it: "configuration orients us to the entanglement of imaginaries and artefacts that comprise technological projects".

The basic idea here, then, is that when digital automation technology is implemented, it is not just an *addition* to existing arrangements in the organisation. Instead, it involves *the emergence of a new set of relations* between humans and technology; a new configuration of humans and technology, that performs tasks and distributes responsibilities differently (Baptista, Stein, Klein, Watson-Manheim, & Lee, 2020; Grønsund & Aanestad, 2020; Mazmanian et al., 2014). Our contribution is to examine precisely how these new relations emerge in practice.

The idea that humans and technologies perform tasks together in and through relationships is not new in the study of digitalisation processes. Wihlborg et al. (2016) for example illustrate, by drawing on actor network theory, how the implementation of an automated decision making system spawned a new configuration in which case officers became positioned as mediators between the digital system and clients. Mazmanian et al. (2014) focus on how human-technology configurations as loci of agency are constantly in a state of dynamic (re-)configuration. In their ethnographic study of the management of planetary missions they present an empirically rich account of the ways in which information technology and humans are configured to produce organisational agency. And, more recently, Grønsund and Aanestad (2020) have showed how seemingly automated systems are constituted as human-in-the-loop configurations with humans and algorithms augmenting each other and sharing responsibilities in new ways.

Recognizing the generative character of configuring and the sociomateriality of technological projects, the interactions that take place when new technology is introduced then becomes of key interest to capture empirically. It is in the sociomaterial conjoining and forming of new relations that we can trace the sources of change as digitalisation unfolds.

4. Research approach

In order to study the interactions in which new technology and organisational arrangements are co-adapted to each other, or put in our conceptual language, the emergence of a new digital-human configuration, we adopted a case study approach (Cavaye, 1996). Our case was selected on the basis of providing an opportunity to follow and explore an effort to automate governmental services from the very beginning, and thus gain insight in the early stages of the process. The case consists of a project through which an RPA (a robot process automation)-technology was adapted in the social care-department of a mid-sized Swedish municipality. A thorough description of the project is given in Section 5.

As scholars in the fields of information systems and organisation studies have long argued for the need to study technology-in-use and as part of practices (Cecez-Kecmanovic, Galliers, Henfridsson, Newell, & Vidgen, 2014; Gherardi, 2010, 2016; Orlikowski, 2007, 2008) the data-collection was geared towards capturing the socio-material practices involved in digitalising work. In practice this meant that the first author performed an explorative 2-year long ethnographic study, beginning early 2018. Having been granted access to follow the project without limitations as an observer, the researcher conducted observations, performed interviews, and collected documentation related to the project.

The observations focused on 4 key events and activities that occurred in the project, with the purpose of documenting the mundane work of adapting a new technology to the municipalities needs and practices. Observation 1 was performed of an information meeting where the project manager informed the affected staff about the project before the project started. In this meeting, the project manager met with staff from all affected units, ostensibly to update them on the scope and aim of the project and answer questions. Observations 2 and 3 took place during the work-process mapping workshops that were organised with the aim of capturing, in detail, exactly how the case-officers work was done. Each workshop lasted for 4 h and was led by a process leader. In the workshops 6 case officers, 6 team leaders, 2 unit managers and 1 ICT administrator participated. The final observation (4) was done of the project manager's documenting of the work process of the case officer in situ. On this occasion the project manager filmed a case officer performing her work, while explaining each step taken. The observation lasted for 4 h in total. This observation, along with its retelling through interviews, provides an understanding of the work process to be automated. Throughout all observations extensive field notes were taken and when permitted audio was recorded and photographs taken.

Interviews were conducted on 4 separate occasions with the manager of the project and with 15 members of staff involved in the project; unit managers (2) and case officers (13) that worked with processes that were to be automated. In the interviews, open-ended questions were used relating to the current work practice of the case officers, how digital tools were currently used, and the expectations staff had of the technology. The purpose of the interviews with the case officers was to develop an understanding their current work practices and of the day-to-day operations of the unit. Additionally, we aimed for insights into how the case-officers envisaged the effects of automation on their work. The project manager was interviewed four times in order to gain insight into the progress of the project and the internal considerations of challenges that emerged as the project progressed. All interviews were recorded

and subsequently transcribed.

The documentation gathered included project plans (several versions), communications material, internal reports and working documents, such as , the results from the mapping sessions. As empirical material, they assisted in gaining insight into policy aims, managerial vision and planning of the project. In total, 21 documents were collected and stored digitally. See Table 1 for a full account of the empirical material.

The analysis of the empirical material emerged in four steps. Initially, the first author did a preliminary coding of the interview transcripts and observation notes with the simple purpose of identifying 'doings' and to get a first idea of the interactions that were going on in the material. Then, all authors re-read the material and met to discuss it. In particular, our attention was drawn to the work through which public services, public servants and RPA-technology had to co-adapt to each other as a new human-technology configurations emerged. Inspired by Suchman (2012) and Baptista et al. (2020), we decided to call this 'configuring work'. In the discussions that followed, several aspects in the empirical material stood out as particularly interesting in relation to what they revealed about how influence was exerted in the process. Through a series of iterations, various aspects of configuring work were exemplified in writing by the first author and then read closely and scrutinized by the other authors and subsequently discussed by all. In the discussions we paid particular attention to how people and artefacts performed configuring work. In so doing, we realized that the interactions that made up configuring work had three different effects; they nudged the project in a particular direction; they simplified the work of case-officers; and they aligned the technology developed with its imagined possibilities. Based on these effects we decided to call the three aspects of configuring work nudging, simplifying and aligning, and selected illustrative quotes to be presented in the paper. The third step was to iteratively go back and forth between the empirical material and the literature to work through our analysis. It was at this point that we worked through potential implications and our conclusions. This was further developed in the final stage, as the paper was commented on by external reviewers.

5. The automation-project

The case studied consisted of a project through which it was intended that two particular work processes, presently done by social workers at the social care unit of a municipal authority, were to be automated using a robot process automation (RPA) solution. In the following we will describe the context of the project, the technology implemented and the project's background. The specific attributes of RPAs are discussed in Section 5.2.

Table 1
Empirical material.

Data source	Role/type	Purpose	Instances
Observations	*Key project events and activities*	*Capturing doings and interactions*	4
Staff interviews	*Case officers and managers of the benefits unit*	*Understanding current work practices, procedures and expectations on technology*	15
Project manager interview	*Manager of the automation project*	*Following the progress of the project and gain insight in planning and execution of the project*	4
Project documents	*Decision memorandum, project plan, communications plan, presentations, internal reports*	*Gaining insight into policy aims, managerial vision and planning of the project*	21

5.1. Context: The local authority, legislation and trends

The automation project took place in the social services department in a medium-size Swedish municipality. In Sweden, local governments are, through the national legislation of the Social Services Act, tasked with the authority of administrating a large swath of public benefits and services, among them elderly care and care for people with special needs. Local governments (also called municipalities) have independent powers of taxation and collectively employ about 25% of the Swedish work force. The social care services department that is the subject of this article was tasked with investigating individuals' need for benefits and services outlined in national legislation and in local guidelines, and to ensure that citizens get access to the benefits and services that they are eligible for.

In Sweden, as elsewhere, the proportion of elderly people is increasing, meaning that costs are rising for local governments. The Swedish Association for Local Authorities and Regions (SKR; previously pr SKL) has predicted that the recruitment needs of local governments will exceed labour market capacity in the near future and that digital technology offered the single best solution to this (SKL, 2018). The use of automation has thus been promoted by SKL as a way of increasing efficiency and reducing dependence on labour. A particular type of automation technology that has been promoted as a suitable form of automation for public work is Robotic Process Automation (RPA) (SKL, 2017).

5.2. Technology: RPA

RPAs are best understood as virtual robots designed to take over routinized work, in this case the work performed by benefits case officers working at the social care unit of a local authority. RPA is a software with the ability to emulate a human user in software environments whose tasks involve collecting and acting on data retrieved from several distinct digital systems. RPAs are able to recognize different types of data, either by reading the underlying tags in the software code or by reading the graphical interface displayed on a screen, using artificial intelligence powered 'computer vision' (Issac, Muni, & Desai, 2018). Most RPA software utilizes machine learning to enhance the ability to parse the user's screen and may be connected to various forms of machine learning algorithms as part of an automated workflow. RPA by itself is usually not considered a form of artificial intelligence (AI) though since the algorithms must be pre-defined and are not self-learning (Lacity & Willcocks, 2018). Instead, a more apt comparison may be industrial robots in the manufacturing industry which are programmed to be efficient in performing a particular workflow.

RPAs have been adopted in industries such as banking, financial services, insurance, health care, telecommunications, media and retail (Lacity & Willcocks, 2018) and increasingly, public administration (Penttinen, Kasslin, & Asatiani, 2018). Several Swedish municipalities, including the one where our study was performed, are currently involved in implementing RPAs as a way to automate work processes that rely on the use of different non-federated systems, i.e. systems that cannot, without human or other intervention, communicate with one another (Ranerup & Henriksen, 2019).

As noted, the development of RPA hinges on the ability to be able to take defined work processes, break them down and re-present them as detailed algorithms executable by a software 'robot'. In the municipality we studied, such detailed work descriptions did not exist prior to the introduction of RPA, and consequently all processes first had to be documented as detailed process flow-charts and then algorithmic textual descriptions. This was done by involving case officers, managers and software developers in activities that involved the collaborative sharing of experiences and knowledge relevant to work practices.

5.3. The benefits claim-process and digital safety alarms

The automation project began in the summer of 2018. Initially it was planned to be a one-year project, however due to delays in the procurement process it was delayed into 2020 and data collection is ongoing as of 2021 on the implementation and results of the project. Initiated by the head of department and planed by the department's digital strategist, it was staffed by a full-time project manager who reported to a steering committee which consisted of the digital strategist and unit managers in the department. The project involves three units in the social care services department, all dealing with benefits claims for public services: the elderly unit, the disabilities unit and the hospital unit. The elderly unit processes all claims submitted by retired citizens (i.e. older than 65); the disabilities unit processes all claims by non-retired citizens with special needs; and the hospital unit, co-located at the hospital, deals with claims from citizens who are in the processes of being sent home after having been hospitalized, but who still require physical assistance.

These services operate under the Social Services Act and answer to different municipal committees. All in all, the units have about 60 employees; 25 each in the elderly and disabilities units, and 10 in the hospital unit. Apart from a few administrators, all employees are social care workers with some type of degree from higher education in social work. In this paper, these employees are referred to as 'case officers', since they while steeped in an ethos of social care work in practice worked as public administrators that investigate a case and evaluate the need for benefits in relation to the applicable legislation.

As soon as a case officer is notified that there is a citizen with a need who might qualify for some type of social assistance, a case is opened, and the case officer investigates if the need qualifies for a particular benefit. If the claim is approved, a different case officer then starts the process of deciding the fee that the individual has to pay to get the benefit. The level of the fee depends on the level of service and the income and wealth of the individual.

A case officer is notified of a potential need either by direct contact with the citizen in a meeting, or through a notification sent by e-mail from the municipal Contact Centre. A case officer then contacts the individual to collect information, either over the phone or in a meeting. The result of this investigation is compiled in a digital case work-system. After the investigation, a formal decision on the level of benefit is made by a case officer and the individual is notified via regular mail.

Among the public services that individuals can apply for is a digital safety alarm. A digital safety alarm is a wrist worn device with a button for the individual to press that enables them to communicate to home care staff if they get into difficulties. Typically, digital safety alarms are provided to elderly people deemed to have a high risk of falling in their homes. In the automation project, the case work process for digital safety alarms was the first process that was automated using RPAs. In the findings-section below, we describe in detail the aspects involved in the configuring work involved in automating case work for digital safety alarms.

6. Aspects of configuring work: nudging, simplifying and aligning

The practical aim of the automation project was to transition from a configuration where the processing of digital safety alarm claims was handled by a human case worker interacting with citizens and working in a case management system to a configuration in which the role of case officer was supplanted by a software robot; see Fig. 1.

Below we will describe and exemplify three core aspects of the configuring work process through which the transition took place: nudging, simplifying, and aligning.

6.1. Nudging

The first aspect of the configuring work nudged the project in a certain direction by the figuring together of the broad objectives of the project with positive imaginaries of the role of technology in relation to future work and for improved citizen service.

The municipality studied here was not the first Swedish municipality to seek to automate processes and both the head of department and the digital strategist were inspired by other success stories of how technology could help improve municipal work when outlining the objectives of the project. In the project description, the two impact goals of the project were formulated as: "Streamlined process and shortened time for case

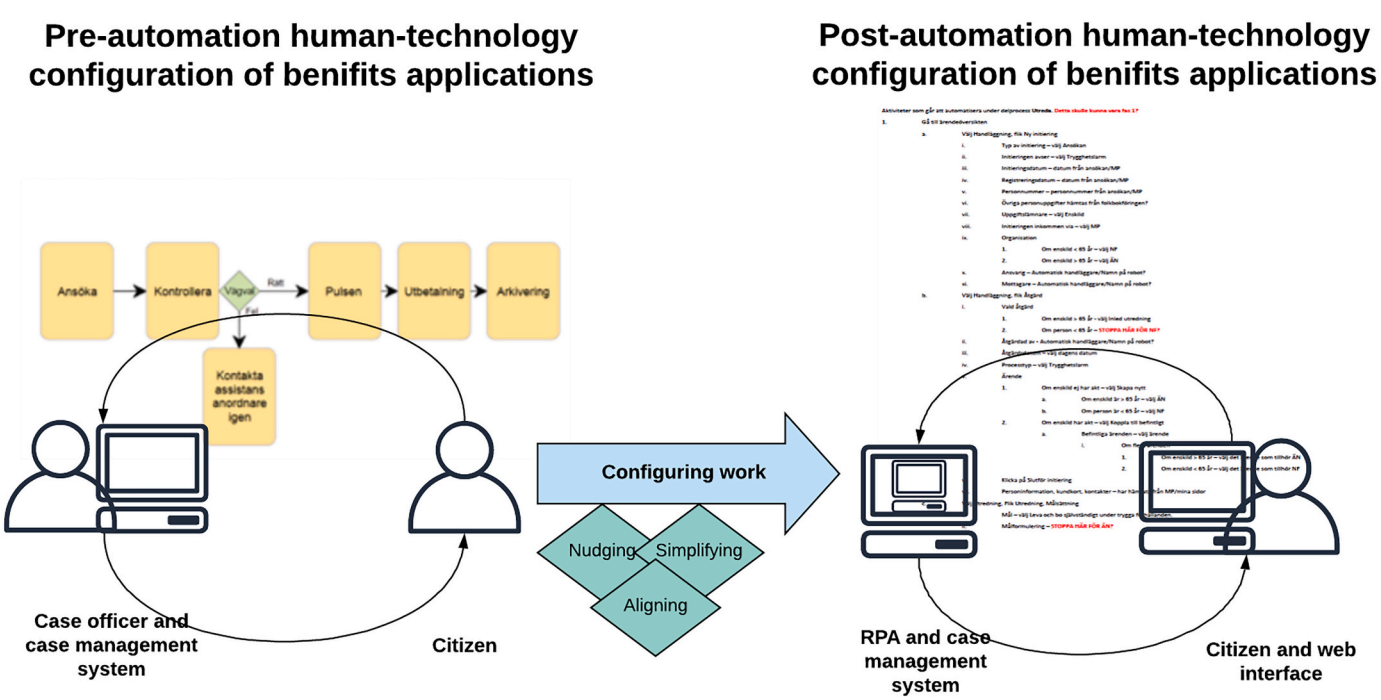

Fig. 1. The emergence of a new human-technology configuration of benefits applications, before and after-automation.

work of prioritized processes from application to decision" and "Managers and co-workers experience that co-workers have more time available for other qualified work tasks". That the new technology would free up time for the case officers to focus on other tasks was repeatedly echoed throughout project, for example in the project plan, in the decision memorandums that the Head of Department signed off before resources were allocated, and at meetings, for example in an information meeting that the project manager conducted with the staff at the Benefits Unit. During this meeting, the project manager summarized the benefits of automation as something that would:

"Unburden, ease and facilitate, raise efficiency but also quality. Both the hard sides and the soft sides. There is not anyone saying that this is just about saving money. Sure, that is important, but so is quality, we want to make it function better."

That the project was about 'freeing up resources and not laying people off' in fact meant that the municipality would need to recruit more people, the project manager argued. That officers would be able to do more important work was also stressed, but which tasks they would be able to do were never specified in the project documentation, or indeed in subsequent interviews with the project manager or unit managers. It was also stressed that the 'citizens' perspective' on the project was important: automation would lead to more objective decisions and shorter processing times.

Central in the nudging aspect was also the figuring together of the project' objectives with positive imaginaries of the robot, who, according to the strategist "can work all hours of the day, which means that people can make requests also at evenings and weekends, not just during office hours". It was however stressed early-on that the word "robot" should not be used since it could be"unsettling", as the strategist phrased it; robots may be associated with threatening human jobs. Instead, the strategist and the project manager both stressed the importance of communicating with affected personnel in a "good way" regarding the subject of automating; "human warmth and contact" should not get lost, as the project manager for example said in an interview. How this was to be achieved was however never discussed, and from the outset, the project's costs and benefits were only vaguely stated and consistently skewed toward the positive.

The effect of the figuring together of the project objectives and the positive imaginaries of technology was the nudging of the project in a direction that both in the initial phase, as well as later, secured resources through claims of increased efficiency and round-the-clock service availability made possible (only) by introducing tireless robots. Emotive terms like "robot" were however banned, in an attempt to minimize potential resistance from the case officers. The imperative of efficiency was emphasized, while vaguer notions like "retaining human warmth" remained in the background. As these elements of the project objectives and the positive imaginaries of technology were brought together into a proximity, they began to configure one another; some retaining across the duration of the project (in plans and agreements) and others remaining vague. In summary, the figuring together of different elements nudged the project on a particular trajectory.

6.2. Simplifying

A second aspect of the configuring work was the simplifying of complex and multi-linear tasks into simplified processes. This happened through the figuring together of elective imaginaries of work with materials such as, for example, post-it-notes, pens and whiteboards and with imaginaries of technology, especially the algorithm. Simplifying the process was a key step in order to make the tacit knowledge of case officers explicit and possible to algoritmicizze.

The figuring together of imaginaries of case work and materials for example took place in workshops, where detailed representations of how services were presently delivered through the work of the case workers were created. Attending these workshops were the project manager, an ICT-administrator, two unit-managers and six case officers. In the first session, the process leader distributed post-it-notes to the participants and asked them to write down the actions they took in relation to the safety alarm-process. The session was held in a conference room with everyone sitting around a large table with the process leader standing at the whiteboard at one end of the room. After having written down everything they could think of that happened in the work process, the participants were asked to read out loud what they had written on their post-it-notes, and to, in dialogue with the group and the process leader, subsequently put them on the whiteboard. The following interaction exemplifies this activity:

Process leader: Are you almost done? So now I thought that we could put up the post-its on the whiteboard. So, I want you to help me with that. We can do one at a time and you can read what the post-it says and then give it to me so we can figure out where to put it.

Case officer 4: [reading aloud to the group] Accept application.

Process Leader: Accept application. Now, since this is the first one we put up we can say that it happens about here [Putting the post-it up on the whiteboard].

Case officer 4: Go into [the case management software] and initiate new case.

Process leader: That happens after that in any case [Putting the post-it after the first one].

Case officer 4: Doing investigation, write investigation.

Process leader: So this is, this is a bit like the same step for you? Is it happening at the same time?

Case officer 4: Yes, well it happens in one go so to say.

Process leader: It is in one go yes. Yes, okay then we do like this and then we will see how to move these around [putting the post-its in a vertical row in temporal order, with the first activity at the top].

Case officer 4: Yes, and then we have assessment there and final edit of the investigation.

Process leader: Yes.

Case officer 4: Making the decision and final edit. Approve order, that maybe… yes that is in one go. Or it is the same investigation, but I go to order now.

Process leader: So, you order something?

Case officer 4: Yes, and send the order.

Process leader: Okay, we put that here [again putting the post-it up on the whiteboard] then because here you accept something and here you order something.

Case officer 4: Yes, or I don't know what you mean because you do everything…

Process leader: You do it all in one go?

Case officer 4: Yes, and then I edit it.

Process leader: Okay, let's do it like this then [re-orders post-its sequentially along the vertical line].

As seen above, the process leader, the project manager and the case officers collaborated to articulate what the current work activities entailed through the material means of post-its, pens and the whiteboard, the result being the arranging of post-its on the board according to an imagined timeline, starting with the first activity that the case officers brought up, finishing with the final activity. In some instances, this however meant that parts of the process that the case officers articulated as happening simultaneously were reorganised so that they also followed a linear progression. In other words, the process leader used the post-it-notes to create a simplified, linear sequence out of a work process that, according to the experiences of the case officers, was in practice very much mangled together in a dynamic interaction.

Configuring work also involved imaginaries of technology, especially that of the algorithm that would drive the RPA software. A representation of the case work was produced by the process leader who developed it as a basis for codifying the algorithm of the RPA. Although the representation fits the functioning of algorithms well, it simplifies the work performed by the case workers.

Through the practices exemplified above, the figuring together of elective imaginaries of work, with basic office materials, and with the

linear imaginaries the algorithm, lead to the simplifying of complex and multi-linear tasks of case work. The materiality of the process also played a role in this. The post-it-notes, for example, allowed for a structuring and separation of case officers' activities into discrete packages of activities that to the case officers unfolded in different ways depending on their interactions with service clients. At no point did case officers mention *caring for*, *supporting* or *calming down their clients*, or any other activities that they also engage in. We would argue that the process of configuring work has already disciplined them to focus on 'actions taken', and that the restrictive space of post-its and the articulating of activities in front of their colleagues out loud, had disciplining effects. Clearly, through this aspect of configuring work, the work actually performed by the case workers were simplified.

6.3. Aligning

The third aspect of configuring work involved the figuring together of technology and imaginaries of the citizen. This led to the aligning of the technology in a way that was primarily guided by the imagined technical possibilities of this, rather than by what the case officers, guided by professional ethics, thought might be good for the citizens. Knowledge thus became codified aligned with presumed technical possibilities.

In one of the process mapping sessions, the process leader asked the case officers to give their input to the representations of work as it had emerged out of the configuring work in one of the previous sessions. The trajectory of the configuring work in this interaction was set largely by the way the requirements of technology were aligned with work practices. The process leader, in effect, mediated between the organisation and the technology – though acting, primarily, as the agent of the technology and aligning it with the practices in the organisation. One example of this was the way applications would be accepted once the process was automated. The process leader explained that if the RPA was to process an application, the applying citizen would first fill out a form on-line, and in order for this form to not 'get stuck', but move through the system, the participants now needed to decide what was considered a 'complete application'. This led to some case officers expressing concern, since the way in which the process leader described the process didn't match their sense of what would be appropriate, or indeed what would be in accordance with the relevant legislation:

Case officer: But we can never have a barrier so that the application does not go through, I do not think so, not legally.

[…]

Case officer: I also do not think we should have that, even if it was okay legally. It should be experienced as easier [to apply], otherwise you would rather just call us.

In interviews, the case officers also expressed concern about the potential loss of personal interaction with the citizens, as the process became automated. The first point of entry to social benefits is often a digital safety alarm, which was one of the case work-processes that was to be automated first. The same issue was also brought up in a process mapping workshop. As one of the case officers interjected in a discussion with the process leader:

Case officer: Yes, we do loose the opportunity to inform about the benefits. We also loose the opportunity to sometimes catch other needs, or to see that the need is even bigger. Because it starts with a safety alarm but when we talk to this person, we may realize that 'well this person hasn't eaten in four days' or 'oh, they fall over all the time' or whatever it might be that makes it the case that we actually can inform about and motivate them on other benefits. That we lose.

Process leader: Do the individual experience lesser quality then, if you are not part of the process?

Case officer: Of course, that might be a risk. The human interaction is important.

Process leader: But is it something that gets worse for you?

Case officer: No not to us.

Unit manager: For the individual possibly."

Here we see how the technology was figured together with the imagined citizen. But rather than leading to any major change in the RPA, it was suggested by the project manager that rather than informing about the benefits in dynamic interaction, information about the service could be written in a text box in the digital application and by focusing the discussion on what information that had to be given up front in the web-form. The configuring of the RPA was thus guided by its technical possibilities.

While the case officers worried that the quality of service might suffer if they were to miss out on the personal interaction with citizens, this was ultimately not something the RPA would be able to do. Thus, the possibility to interact with citizens was not included in how work was imagined in the automation process. In other words, through the configuring process, elements that are not codifiable, not supported by RPA, are made to seem impossible.

6.4. Summary

The implementation of the RPA emerged through a sociomaterial configuring process involving aspects of nudging, simplifying and adapting. Through this, a particular task performed as part of the case-officers' work was selected, simplified and codified in line with the technology developed. For a summary of these aspects, see Table 2.

7. Discussion

As seen above, the digitalization-process whereby the RPA was implemented in the local authority took place through an emergent, relational process that involved the social and the material. Below, we will discuss how this dynamic was also successively shaped by the particular vested interests, ethics, discourses and materialities that comprised it. In so doing we attempt to account for how and why local government digital systems, even where they are adapted collaboratively in conjunction with professional case workers (in this instance social workers) may still nevertheless come to be adapted in a way that threatens both the professional autonomy of those professionals and, potentially, the quality of the service (Buffat, 2015; Busch & Henriksen, 2018; Larsson & Jacobsson, 2013).

7.1. The dynamics of configuring work

On the surface one might say that what transpired in the process mapping workshops and subsequent algorithm design work was simply the collaborative production of a new representation; a more detailed representation of existing practices and routines in the form of a linear step-by-step account of them. However, what became apparent in our study was the role of the figuring together of the algorithms and the imaginaries in driving the dynamics of this process.

At the heart of RPAs are algorithms and in theory algorithms should render the RPA highly flexible – responsive to the demands placed on it.

Table 2
Aspects of configuring work, their dynamics and their effects.

Aspect	Dynamic	Effects
Nudging	*Figuring together imaginaries of the technology with visions of the future of work and services*	*Set the trajectory of what was to be achieved and secured resources*
Simplifying	*(Re-)configuring work as algorithmic by figuring together elective imaginaries of work with materials such as, post-it-notes, pens and whiteboards*	*Limited the scope of efforts and made tacit knowledge explicit*
Aligning	*Figuring together technology and imaginaries of the citizen*	*Codified knowledge in line with the possibilities and limitations of the technology*

Code, unlike other types of materiality, can be edited (Orlikowski, 2000). In theory, the algorithms were thus to be written around the demands of the work. However, the process of interacting with the planned algorithms revealed them to have a degree of unexpected obduracy. It was clear that throughout the interaction the technology was allowed to retain its essential ethic of standardisation, rationalisation and efficiency, while the case officers were edged toward giving up their ethical preferences (Laurent, 2008; Petrakaki & Kornelakis, 2016). An enduring feature of the relationship between work and algorithms is that work must be codifiable for it to be represented algorithmically. In short, the algorithm itself is obdurate within the dynamics of the configuring work by its requirement for only codifiable context. To create an algorithm is to make a model of reality which necessarily implies making decisions on what to include and to exclude (O'neil, 2016). It is however important to acknowledge that it is not only a question of making choices, but of favouring the exclusion of choices involving such work elements as practical judgement and empathy (cf. Wagenaar, 2004). The result is that work may be stripped of particular ethical elements, simply because these are not already conducive, in the form of work processes, to codification or cannot be altered in a way that renders them codifiable. Thus, even with the best intentions, policy makers and practitioners will run up against the materiality of digital technology and the limits of what computing can achieve with direct consequences for the re-design of work.

The role of elective imaginaries also stands out as key in shaping outcomes from the process of configuring. This concerns both the imaginaries of what the technology would be able to do or not, and the imaginaries of work. Critically, in the figuring together of these imaginaries, power relations also became apparent. Although the organisation and its case officers had more opportunities to resist this transformation than most organisations encountering technology might enjoy, due to the participative set-up of the design process, it was clear that the views of case officers were overshadowed by the logics of the technology: simplicity, linearity and efficiency. Key here also was the role of the process leader, whose role emerged not simply to provide input to the system design, but also to nudge and police the conversations about the technology; keeping them within the boundaries set out in the beginning. As accounted for in Section 5.1, to utilize digital automation solutions in order to make government more efficient and better prepared to face challenging demographic trends is a broad policy goal in Sweden. However, the process-leader and the project manager lacked a background in social work, while their roles were to realize the policy aims of the departmental management that formed the steering committee of the project (which in part was a local adaptation of national e-government policy goals); which were to make the process more efficient and less labour intensive.

That technologies are shaped by policy aims is not a novel proposition (cf. Cordella & Iannacci, 2010), but in our conception of configuring work we situate that instantiation in the figuring together of language about what is to be achieved and the capabilities of technology based on algorithms. The result was a system shaped by the broader abstracted interests of public sector policy makers and this outcome was ensured by the intervention of managers throughout the local adaptation processes.

Managers play an important role in driving technological change (Tangi, Janssen, Benedetti, & Noci, 2021) and legitimately so. We would however suggest that the future design of similar participative local adaptation processes needs to pay careful attention to how power is likely to be wielded within the process and in whose interest.

7.2. The reshaping of public administration work

Through the process described above, the work of public administration, previously performed as a social practice (Wagenaar, 2004), was extracted out of the broader web of practices in which case officers actually carried out their duties. The situated knowledge that case officers brought to bear on seemingly simple interactions with citizens, informed by their educational training and professional experience and identity, was no longer part to be of the service provided by the municipality. This, we believe, may explain why digitalisation of public services does not only lead to increasing efficiency and accountability, but to the shrinking of professional discretion; sometimes even to decreased service quality (Busch & Henriksen, 2018; Cordella & Tempini, 2015; Ranerup & Henriksen, 2019; Wihlborg et al., 2016).

Although e-government ICTs can have positive effects (cf. Cordella & Tempini, 2015; Ranerup & Henriksen, 2019), the quality of public services still depends upon skilled practitioners who can help clients or citizens navigate the myriad of services, related rules, funding and help clients access the services they need. While previous research has argued that some types of work in which tacit knowledge, practical judgement and social interaction are key tenets are resistant to codification and thus automation (cf. Autor, 2015; Woodcock & Graham, 2019), our findings highlight that such aspects might instead simply be removed from that work processes to render it codifiable. As this study has shown, automating the public service delivery may reduce the complexity of public administration work, with the risk that the service-level is reduced, since the codification of a service does not necessarily replicate it. Instead it changes it, thereby stripping it of much of its value. To public sector managers and policy makers it is thus worth considering that while a public sector process might seem routine and rule-based, and thus ripe for automation, it might be the case that human interaction between professionals and citizens are key to what generates the service's actual value.

However, while the digitalisation of services brings the potential to produce cold and unhelpful services, this need not be the case. The nature of the technology plays a role here, by encouraging the 'breaking down' of complex activities into packets of code. The actual outcome of the work performed – the actual service delivered – is in many cases still in the hands of humans, though. The algorithms and imaginaries that shape the understanding of the service as inefficient, that prioritise ease of delivery over the quality of client experience, and that foreground the real and imagined limitations of the technology, are all inputs into the process of automating. This means that processes of local adaptation of technology need to be carefully outlined and how managerial power come to play needs to be considered. Otherwise, there is a risk that more weight is given, for example, to managerial voices and to the materials aimed at capturing and mediating the discussion (post its, pens and whiteboards), and that the process is too much in the hands of external process leaders who do not understand the nature the service and who do not share existing organisational cultures and values.

8. Conclusion and future research

In seeking to understand more about the re-shaping of public services in public administration through the process of digitalisation, we have turned our attention to the interactions through which the work of digitalising is actually done, involving what we have called configuring work. Paying attention to the relational and on-going processes of configuring work has helped us understand how technologies emerge through a close and collaborative interaction with the implementing organisation. Our paper contributes to a clearer understanding of how the processes by which digitalisation unfold, which we have called configuring work, matter and are of consequence for public administration and the services that they provide by showing the role that power, discourse and algorithmic materiality play in configuring work as a new technology is designed. As materiality and imaginaries are figured together through different aspects of configuring work (for example nudging, simplifying and aligning), we show how the public service being automated emerges is fundamentally changed.

We believe that future research would benefit further from unpacking what gets left out when public sector work is re-configured through the development and implementation of digital technologies, and to, when doing so, take seriously the particular technologies involved and

the fact that work is not composed of discrete packets or actions, but rather a web of practices. Different technologies may invite different figurations, due do different materialities and imaginaries and different types of work being more or less susceptible to codification. And, indeed, given differences in norms, cultures and organisational arrangements, the configuring work of different technologies in different organisational contexts will most probably look different. Our proposition is that some type of configuring work will take place whenever a new technology is developed, and that research on how disparate elements are figured together would provide the possibility of further develop the dynamics of how technological change occurs. We therefore hope that this paper may serve as an invitation for more studies to closely follow configuring work as it occurs in different. Focusing on configuring work could open up what we believe is a productive path for digitalisation research that would help better understand how certain dynamics or impacts come to be. Instead of conceptualising new technology as going through discrete phases of design, implementation and use and looking for antecedents of failure or success within such phases, configuring work offers an analytical focus towards the ongoing process of sociomaterial relation-making through which events and effects emerge in certain ways.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

This research was funded by a grant from the Swedish Research Council for Health, Working Life and Welfare, Forte [grant nr. 2016-07210]

References

Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives, 29*(3), 3–30. https://doi.org/10.1257/jep.29.3.3

Baptista, J., Stein, M.-K., Klein, S., Watson-Manheim, M. B., & Lee, J. (2020). Digital work and organisational transformation: Emergent digital/human work configurations in modern organisations. *The Journal of Strategic Information Systems, 29*(2). https://doi.org/10.1016/j.jsis.2020.101618

Boll, K., Rhodes, R. A., & Pors, A. S. (2015). Becoming digital–passages to service in the digitized bureaucracy. *Journal of Organizational Ethnography, 4*(2), 177–192. https://doi.org/10.1108/JOE-08-2014-0031

Bovens, M., & Zouridis, S. (2002). From street-level to system-level bureaucracies: how information and communication technology is transforming administrative discretion and constitutional control. *Public Administration Review, 62*(2), 174–184.

Buffat, A. (2015). Street-Level Bureaucracy and E-Government. *Public Management Review, 17*(1), 149–161. https://doi.org/10.1080/14719037.2013.771699

Busch, P. A., & Henriksen, H. Z. (2018). Digital discretion: A systematic literature review of ICT and street-level discretion. *Information Polity*, 1–26 (Preprint).

Busch, P. A., Henriksen, H. Z., & Sæbø, Ø. (2018). Opportunities and challenges of digitized discretionary practices: a public service worker perspective. *Government Information Quarterly, 35*(4), 547–556.

Cavaye, A. L. (1996). Case study research: a multi-faceted research approach for IS. *Information Systems Journal, 6*(3), 227–242.

Cecez-Kecmanovic, D., Galliers, R. D., Henfridsson, O., Newell, S., & Vidgen, R. (2014). The sociomateriality of information systems: current status, future directions. *MIS Quarterly, 38*(3), 809–830.

Choi, I. (2016). *Digital era governance: IT corporations, the state, and e-Government*. Taylor & Francis.

Cordella, A., & Iannacci, F. (2010). Information systems in the public sector: The e-Government enactment framework. *The Journal of Strategic Information Systems, 19*(1), 52–66.

Cordella, A., & Tempini, N. (2015). E-government and organizational change: Reappraising the role of ICT and bureaucracy in public service delivery. *Government Information Quarterly, 32*(3), 279–286.

Dourish, P. (2016). Algorithms and their others: Algorithmic culture in context. *Big Data & Society, 3*(2). https://doi.org/10.1177/2053951716665128, 205395171666512.

Finn, E. (2017). *What algorithms want: Imagination in the age of computing*. MIT Press.

Gherardi, S. (2010). Telemedicine: A practice-based approach to technology. *Human Relations, 63*(4), 501–524.

Gherardi, S. (2016). Sociomateriality in posthuman practice theory. In *The nexus of practices* (pp. 50–63). Routledge.

Grønsund, T., & Aanestad, M. (2020). Augmenting the algorithm: Emerging human-in-the-loop work configurations. *The Journal of Strategic Information Systems, 29*(2), 101614.

Haraway, D. J. (1997). *Modest_Witness@ Second_Millennium. FemaleMan_Meets_OncoMouse: feminism and technoscience*. New York: Routledge.

Issac, R., Muni, R., & Desai, K. (2018). Delineated analysis of robotic process automation tools. In *Paper presented at the 2018 second international conference on advances in electronics, computers and communications (ICAECC)*.

Kolkman, D. (2020). The usefulness of algorithmic models in policy making. *Government Information Quarterly, 37*(3), 101488.

Lacity, M., & Willcocks, L. P. (2018). *Robotic process and cognitive automation: the next phase*. SB Publishing.

Larsson, B., & Jacobsson, B. (2013). Discretion in the "Backyard of Law": Case handling of debt relief in Sweden. *Professions and Professionalism, 3*(1).

Laurent, V. (2008). ICT and social work: A question of identities?. In *The future of identity in the information society* (pp. 375–386). Springer.

Lindgren, I., Madsen, C.Ø., Hofmann, S., & Melin, U. (2019). Close encounters of the digital kind: A research agenda for the digitalization of public services. *Government Information Quarterly, 36*(3), 427–436.

Mazmanian, M., Cohn, M. L., & Dourish, P. (2014). Dynamic reconfiguration in planetary exploration: A sociomaterial ethnography. *MIS Quarterly, 38*(3), 831–848.

Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly, 36*(4), 101385.

Nygren, K. G., Axelsson, K., & Melin, U. (2013). Public e-services from inside: A case study on technology's influence on work conditions in a government agency. *International Journal of Public Sector Management, 26*(6), 455–468.

O'neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. Crown.

Orlikowski, W. J. (2000). Using technology and constituting structures: A practice lens for studying technology in organizations. *Organization Science, 11*(4), 404–428.

Orlikowski, W. J. (2007). Sociomaterial practices: Exploring technology at work. *Organization Studies, 28*(9), 1435–1448.

Orlikowski, W. J. (2008). Using technology and constituting structures: A practice lens for studying technology in organizations. In *Resources, co-evolution and artifacts* (pp. 255–305). Springer.

Orlikowski, W. J., & Scott, S. V. (2008). Sociomateriality: challenging the separation of technology, work and organization. *Academy of Management Annals, 2*(1), 433–474.

Penttinen, E., Kasslin, H., & Asatiani, A. (2018). *How to choose between robotic process automation and back-end system automation? Paper presented at the ECIS 2018 proceedings*.

Petrakaki, D. (2018). Re-locating accountability through technology: From bureaucratic to electronic ways of governing public sector work. *International Journal of Public Sector Management, 31*(1), 31–45.

Petrakaki, D., & Kornelakis, A. (2016). 'We can only request what's in our protocol': technology and work autonomy in healthcare. *New Technology, Work and Employment, 31*(3), 223–237.

Plesner, U., Justesen, L., & Glerup, C. (2018). The transformation of work in digitized public sector organizations. *Journal of Organizational Change Management, 31*(5), 1176–1190. https://doi.org/10.1108/JOCM-06-2017-0257

Pollock, N., & D'Adderio, L. (2012). Give me a two-by-two matrix and I will create the market: Rankings, graphic visualisations and sociomateriality. *Accounting, Organizations and Society, 37*(8), 565–586.

Ranerup, A., & Henriksen, H. Z. (2019). Value positions viewed through the lens of automated decision-making: The case of social services. *Government Information Quarterly, 36*(4), 101377.

Reddick, C. G. (2005). Citizen interaction with e-government: From the streets to servers? *Government Information Quarterly, 22*(1), 38–57.

Riemer, K., & Peter, S. (2020). The robo-apocalypse plays out in the quality, not in the quantity of work. *Journal of Information Technology, 35*(4), 310–315.

Seddon, J. (2008). *Systems thinking in the public sector*. Triarchy Press.

SKL. (2017). *Artificiell Intelligens - Möjligheter för välfärden*. Sveriges Kommuner och Landsting.

SKL. (2018). *Sveriges viktigaste jobb finns i välfärden - Rekryteringsrapport 2018* (Retrieved from).

Smith, M. L., Noorman, M. E., & Martin, A. K. (2010). Automating the public sector and organizing accountabilities. *Communications of the Association for Information Systems, 26*(1), 1.

Suchman, L. (2000). Organizing alignment: A case of bridge-building. *Organization, 7*(2), 311–327.

Suchman, L. (2012). Configuration. *Inventive Methods: The Happening of the Social*, 48–60.

Tangi, L., Janssen, M., Benedetti, M., & Noci, G. (2021). Digital government transformation: A structural equation modelling analysis of driving and impeding factors. *International Journal of Information Management, 60*, 102356.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems., 28*(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Wagenaar, H. (2004). "Knowing" the rules: administrative work as practice. *Public Administration Review, 64*(6), 643–656.

Wihlborg, E., Larsson, H., & Hedström, K. (2016). " The computer says no!"–A case study on automated decision-making in public authorities. In *Paper presented at the 2016 49th Hawaii International Conference on System Sciences (HICSS)*.

Wirtz, B. W., Weyerer, J. C., & Geyer, C. (2019). Artificial Intelligence and the Public Sector—Applications and Challenges. *International Journal of Public Administration, 42*(7), 596–615.

Woodcock, J., & Graham, M. (2019). *The gig economy: a critical introduction: Polity*.
Yildiz, M. (2007). E-government research: Reviewing the literature, limitations, and ways forward. *Government Information Quarterly, 24*(3), 646–665.
Zuboff, S. (1988). *In the age of the smart machine*. New York: Basic Books.

Christoffer Andersson is a Phd candidate in industrial organisation at the department for organisation and management at Mälardalens University (Sweden). His thesis work is about digital automation of white-collar work and he is part of the Digma-program, a 6-year research program where 9 researchers study the Digitalization of management in Sweden and the UK.

Anette Hallin is Professor in Organization and Management at Åbo Akademi, Finland, and Mälardalen University, Sweden. Her research concerns how organizing takes place through interaction between technology/materiality and humans/the social. Currently she is leading the Digma-program, a 6-year research program where 9 researchers study the Digitalization of management in Sweden and the UK.

Chris Ivory is a Professor of Organisation and Technology at Anglia Ruskin University. He holds a PhD from Manchester University on Innovation in Construction. Chris has a written about technology change, technology and work, innovation, the role of the client in innovation and project management for leading journals including the British Journal of Management, Planning Theory, Long Range Planning, R&D Management and Construction Management and Economics. He has also co-authored a Routledge book on Managing Complex Projects (2013). Chris has received funding from The European Union to examine technology change in healthcare in the UK, France, The Netherlands and Belgium (two projects) and also, a third three year EU funded project looking at the uptake of Industry 4.0 by manufacturing SMEs, also in the two-seas region. He has also won funding and from the Swedish national funder FORTE to examine the digitisation of management practice in the UK and Sweden as part of a major six-year programme of research. Chris has also been an ESRC invited AIM scholar.