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## **Screen mediated work in an ethnography of official statistics: screen theories and methodological positions**

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**Abstract.** The current omnipresence of screen mediated work has consequences for researchers interested in ethnographically observing digital work ‘in action’ in co-located, face-to-face, fieldwork. Researchers may run into difficulties such as deciding how and when to observe the role of screens, and observing screen mediated work when figures and graphs appear briefly, and often out of view. Two main questions relevant for research on organizational knowledge practices (e.g. the collection and analysis of data) are addressed. First, the chapter addresses the question of how we should conceptualize the roles of screens in digital work by reviewing five ethnographic research traditions: 1) symbolic interactionism; 2) ethnomethodology; 3) panoptic theories of power; 4) actor-network theories; 5) sociomateriality in organizational processes. Second, the chapter addresses the question of how to practically approach screen mediated work by drawing on experiences in an ethnographic research project in a statistical office. Situations and moments from this project help to distinguish five ‘small m’ methodological positions for conducting fieldwork in screen mediated workspaces. These positions furthermore illustrate how ‘screen demonstration interviews’ and (participant) observation were conducted. While these positions cannot begin to cover the full range of possibilities that arise in the field, they provide other researchers with material to help recognize opportunities, foster reflexivity and analytical mobility, and thereby enrich fieldwork.

### **Introduction**

On February 28, 1959, a vacancy with the heading ‘Computer’ appeared in a Dutch newspaper making the following announcement: ‘To resolve critical technical issues related to processing statistical data, Statistics Netherlands will acquire a computer’. It went on to encourage ‘clever youngsters’ with the ability to use this ‘electronic mathematical miracle’ to apply.<sup>1</sup> Today, the purchase of a single computer would hardly be regarded as a miracle. In fact, any visitor to a national statistical institute (NSI) would see computers everywhere. Working behind screens, statisticians do not only clean and analyse data, they also e-mail colleagues, video conference, and search for background literature. In addition, they use WhatsApp on their cell phones, take part in LinkedIn groups and follow the news on Twitter. Some

statistical offices, including Statistics Netherlands (SN), also record their own news items for television networks and social media.

The current omnipresence of computers has consequences for researchers interested in observing the work of professionals specialized in the collection, analysis and dissemination of data ‘in action’. One of these is that, very often, people will be engrossed in their screens. This chapter focusses on the role and presence of screens in ethnographic fieldwork. Screens are electronic, flat displays on which an image can appear. They can be part of laptops, PCs, mobile phones or other devices. Through computers and mobile phones, screens are connected to larger technological configurations, including other devices and infrastructures such as an organizational intranet, a platform, or a shared database. As a verb ‘screening’ can mean opposing things: that something is shielded and made invisible, or that something is projected (Merriam-Webster, 2021). In accordance, how screens affect their environment is not fixed; they can enable and constrain actions depending on (informal) rules, regulations, and other artefacts.

The increasing relevance of screens as part of digital work makes it worthwhile to address two questions in this chapter: first, given the connection of screens to a variety of other devices and their varying roles on the work floor, how should we conceptualize the roles of screens in digital work? Second, how to approach screen mediated work practically as part of ethnographic fieldwork? This second question is motivated by the practical difficulties of deciding how and when to observe the role of screens, and by the additional difficulty of observing screen mediated work when figures, messages, and graphs appear only briefly, and often out of view. In answering these questions, my focus will be on the role of screens in knowledge practices (e.g. the collection and analysis of data). While screens can serve as a heuristic for social inquiry (Winthereik *et al.* 2011), for instance studying how some practices are ‘screened off’ or focusing on ‘displays’, in this chapter I focus on electronic screens as material devices, primarily computer monitors. I take it as a given that screens do not operate on their own. For instance, a screen can display the result of computer calculation. Furthermore, when discussing screens, one might refer to the effects of visualizations presented on interfaces or video displays. However, the screens discussed in this chapter are different from visualizations precisely because they are connected to a technical configuration that transmits data or produces graphs.

In this chapter I will take a few steps towards answering the above questions by drawing on an ethnographic project called ARITHMUS, or ‘How data make a people’. In this project, six researchers observed digital work in statistical offices and conference venues across Europe to observe such aspects as organizational discussions, changes in work routines, and tacit assumptions.<sup>2</sup> At a time when statistical offices are experimenting with the uptake of new data types and analytical possibilities (e.g. social media data and machine learning), our question was: how do these new methods affect how statisticians delineate, define, analyse, and present populations? In statistics, a ‘population’ denotes a group of people linked to a bounded territory, often the nation state or sub-divisions of it (Curtis 2001, Foucault 2009). However, populations are not stable or natural entities. In this research project, the central premise was therefore that populations do not exist in advance. Instead, making populations through statistical practices requires, among others, the continuous work of collecting and analysing data, demonstrating the veracity of the data and the validity of analysis, negotiating population definitions, and so on (Law 2008, Ruppert 2011). We considered it relevant to study changes in how statisticians define, measure, modify, and enact populations because this also has consequences for how people identify with them. Furthermore, it affects expert roles and how policies are designed. One way in which a population can change is when a new data source is adopted. For instance, national

populations are normally defined based on *residency* in a country. When using Twitter data, however, this is no longer possible. Now populations are defined based on *presence* in a country (using geotags).

Because of the project's orientation towards everyday practices, we mainly conducted co-located, face-to-face fieldwork.<sup>3</sup> Although face-to-face work is the focus of this chapter, this work continues in virtual environments (for instance, we also followed social media pages and wikis), and ethnographic projects can benefit from combining face-to-face and virtual methods described in other chapters in this book (cf. Hine 2015). Drawing on fieldwork at Statistics Netherlands, I retrospectively distinguish five methodological positions. Instead of defining methodology as a top-down disciplinary system of rules, procedures, methods, and logics, I refer to methodological positions as the concepts, methods, and practical focus that can guide and enrich ethnographic research in screen mediated work places (I will refer to these as 'small m' methodologies). Fostering awareness of the methodological position we occupy can support attuning ethnographic research along the way as will be shown here for the research activities of screen demonstrations, observation, and participation. Before elaborating on this point, I will first give an overview of how screen mediated work and its effects have been theorized beyond the ARITHMUS project.

### **Conceptualizations of screen mediated work: from synthetic situations to oligopticons**

Broadly conceived, screens have been in use since people started displaying images on a flat surface. Shadow plays and early cinema can both be thought of as screened phenomena. However, the screens central to this chapter, computer monitors, are a relatively recent invention. Until the 1970s, mechanical displays or light bulbs would inform users of a computer's calculation result. In an often-recited episode of computer history, Xerox developed the first device comparable to a computer monitor as we know it today. The idea was eventually brought to Apple via Steve Jobs, where it was made possible for the first time to interact with and through computers through visual interfaces (Isaacson 2015). Whereas the first computer screens were mainly used to interact with the system through code, screens were increasingly integrated in a wide variety of applications. They are now part of our communication and entertainment systems, medical practices, scientific research, police surveillance, and more. Moreover, screens do not solely allow for visual interaction anymore as touch screens have added an extra sense on top of the visual.

The variety of screen applications in knowledge practices can complicate conducting an ethnography of screen mediated work. Malte Ziewitz' reflection on his research illustrates some of the challenges. Below, he reflects on the role of screens in an interview with a content moderator for an online forum (Helen). In the interview, Helen pointed at her computer screen to explain her activities. Looking back, Ziewitz asks himself:

The 'screen' may be mentioned here in conversation, but it is surely not the 'screen' Helen is concerned with? Doesn't she also mention the keyboard and the mouse? And aren't these entities just employed as a literary figure of *pars pro toto* [referring to a larger whole], enacting a computer system the workings of which will soon be explained in greater detail? And what actually is so special about adjusting the screen? Didn't I also need to move the mouse – and in fact the mouse pad! – across the table to operate it? (Ziewitz 2011, p. 213)

Ziewitz asks whether the screen was relevant to the conversation. His hesitation can be partly explained by the fact that, even if we are not interested in screens as part of digital work, they very often take part in organising this work. Therefore, even if our research does not immediately concern the role of screens in digital work, digital work may still be shaped by them. He furthermore wonders what we talk about when we talk about screens. Aren't we really talking about computation systems behind them? Indeed, it is by no means clear in advance how screens should be conceptualized: as singular artefacts, as part of larger systems, or perhaps as the outcomes of capacities we project onto them.

The fundamental openness of ethnographic methods makes this 'slipperiness' of screens difficult to manage. Ethnographers attempt to understand the *in situ* practices of actors (Clifford 1983, 1988). This means ethnography is based on a form of 'immersion' or closeness to the research object, in contrast to methods based on distant observation, such as survey research. Through interviewing, observation (participant or more passive), and studying documents we can learn, for instance, about routines, strategies and artefacts deployed at a site of practice, including their tacit and unwritten conventions or logics (Latour and Woolgar 1986). The intention to examine time and location specific practices also implies that the exact events to be observed and research activities to be deployed cannot be fully determined beforehand. Instead of determining every aspect of a study in advance, many ethnographers let (parts of) their methods, research aims, and theories emerge together.<sup>4</sup>

Such methodological openness, together with the conceptual and methodological slipperiness of screens, can benefit from more clarity about possible methodological positions: how we choose our research object, what we make observable, and how screens are conceptualized accordingly. The next section will suggest five methodological positions based on fieldwork conducted in ARITHMUS. Before turning to these, I will first elaborate on how screens have been implicitly and explicitly conceptualized beyond this project. I discuss five theoretical traditions that ethnographers interested in knowledge practices in organizations such as laboratories, companies, and the police can draw on: 1) symbolic interactionism; 2) ethnomethodology; 3) panoptic theories of power; 4) actor-network theories; 5) sociomateriality in organizational processes. This overview is not comprehensive but rather makes a start at highlighting the role of screens in five central theoretical traditions. For instance, screens have been theorized in yet other ways in relation to, for instance, media and cultural production (cf. Turkle 1995, 2016). Below, I will predominantly review conceptualizations of screens *as part of* knowledge work (e.g. data analysis, knowledge communication and coordination) in science and technology studies (STS) and related fields. This means the focus will be on screens as part of assemblages of different technologies and practices, instead of considering screens apart from their contexts of usage. A final caution is that screens focus our attention on the visual aspects of knowledge work. However, ethnographers may also want to take acoustic and sensory aspects into account (cf. Mody 2005, Myers 2008).

A first conceptualization of screen mediated work draws on symbolic interactionism. In this tradition, screens are examined in the context of interactions between actors, and the meanings, symbols, and realities emerging from these interactions. Karin Knorr Cetina and Urs Bruegger contend that social interactions are no longer situated in local, geographically restricted spaces. Screen mediated work, such as currency trading, produces global social forms in which people do not need to be physically present. Instead, they need to be available for timely and short-term interaction ('response present') (Knorr Cetina and Bruegger 2002a, Knorr Cetina 2014). In sectors such as banking, workers predominantly orient towards global realities (in this case markets) through monitoring, responding,

interacting, and coordinating their activities through screens. This social situation is referred to as a 'synthetic situation' that no longer requires physical presence, and is augmented and coordinated by 'scopic media' (Knorr Cetina 2014, p. 47). Screens (as part of scopic media) are essential to synthetic situations because they visually present otherwise geographically dispersed events; they present events in a streaming temporal order; and they collect and focus a heterogeneous activities on a single surface. Furthermore, they foster mutual awareness because they act as 'mirrors' that reflect workers' real-time actions next to the actions of others (Knorr Cetina and Bruegger 2002a). It is this constant stream of action represented on screens that is engrossing and demands attention. Even though the screen is conceptualized as 'a building site on which a whole economic and epistemological world is erected' (Knorr Cetina and Bruegger 2002b, p. 167), ethnographers also need to be aware of the organizational work behind screens. For instance, screens can only fulfill the role as 'building site' because of professionals have formatted the information in ways that foster trust. In addition, workers' engagements with screens also depend on face-to-face interactions taking place on the work floor.

In ethnomethodological approaches, the analytical focus shifts from social interaction to the object of knowledge (e.g. microbes or crime) (cf. Garfinkel 2002). The point of departure is that perception does not take place in the 'individual brain', but can be understood as a distributed socio-material process in which screens take part (Goodwin 1995, p. 257). Lucy Suchman, for instance, shows that in the design of roads and infrastructures, the visual interface of a screen makes it possible for engineers to imagine distant cities and highlight particular features. Their understanding of the world outside of their office emerges through embodied interactions with screens: through pointing, an engineer physically interacts with a screen to conceptualise the work that needs to be done to build a road (Suchman 2000, p. 12). Next to pointing and gesturing, discursive practices, and professional expertise are relevant to how an image on a screen is interpreted (Goodwin 1994). Accordingly, the screen 'is not simply a flat inscription, a place where information is to be apprehended through vision alone, but the basis of a three-dimensional work area, something that can be touched and manipulated (Goodwin 1995, p. 258). Finally, screens also shape analytical work. Because screens present simplified and standardized representations of reality ('inscriptions', such as graphs), they allow different areas of observation and expertise to be combined. They are not just 'windows' into a reality out there, but they allow diverse spaces with diverse properties to be analyzed in relation to each other. On the other hand, screens can remove much of the 'clutter' that otherwise contextualizes events because they allow for cropping images, creating stills out of video, and backgrounding audio streams (Goodwin 1994, p. 622).

Another relevant engagement of ethnographers with screen mediated work draws on Michel Foucault's account of the panopticon as a model for the exercise of a particular form of power. The panopticon is a prison architecture that allows a single guard from a watchtower to observe the prison population in surrounding cells (a famous design by Jeremy Bentham). However, prisoners can never be sure they are watched. As a consequence, they internalize rules of behavior and the exercise of power becomes 'automatic'; this is what Foucault calls disciplinary power (Foucault 1995 [1977], p. 201). Panoptic theories have been adopted by contemporary researchers to examine current forms of electronic surveillance by video cameras or image recognition, leading to theories of the 'neo-panopticon' or 'hyper-panopticon' (Armstrong and Norris 1999, Lyon 2007). They examine screens as part of the physical architecture enabling this exercise of power. Next to this physical architecture, professional and everyday knowledge, and statistical and disciplinary techniques (e.g. the confession) enable the exercise of disciplinary power. Finally, not only authorities participate in surveillance but also individuals and citizen organizations monitoring authorities (Mann *et al.* 2002, Timan and Oudshoorn 2012). As will be explained in more detail later, these insights were not central to the specific research

project under discussion, which mainly draws on ethnomethodological and ANT-related work (discussed below). Yet, Foucault's work and influence range well beyond this discussion of screens, and many of this project's theoretical premises with regard to the relevance of monitoring populations in modern government are indebted to his writing.<sup>5</sup> In the context of this chapter, however, I suggest that panoptic theories can sensitize ethnographers to the role played by screens in the constitution of power relations within the field.

In ethnographies that take up insights from actor-network theory (ANT) the notion of screens as part of a panopticon from where a comprehensive overview can be obtained from a small space is abandoned. As in ethnomethodological approaches, the focus is on how objects of knowledge are made. Ethnographers are interested in observing is the mutual shaping of human and non-human entities in the ongoing formation of relations that bring into being objects of knowledge, such as populations or microbes. As also explained in the introduction, the knowledge practices (e.g. data analysis) observed by ethnographers are performative: they do not represent reality but brings it into being (Latour 1993). Bruno Latour and Emilie Hermant (2006) describe how Paris, a dynamic and complicated metropole, is essentially unknowable in its full complexity but is constituted in different ways from 'centers of calculation' such as control rooms, laboratories, planetary observatories, and offices. In these places, screens visualize and assemble inscriptions that simplify the real world (Latour 2012). Yet screens do not present a bird's eye view; we did not move from micro to macro. Instead, they take part in a specified and simplified enactment of Paris (cf. Haraway 1988). Control rooms and other screened environments therefore function as oligopticons instead of panopticons: they show very little (*olig*), and this is why we use them. Work inspired by ANT and related approaches (post-ANT, material semiotics) furthermore demonstrate contingencies and fragilities characterizing the operation of screens in practice (Dubbeld 2005, Pols 2011, Ziewitz 2011). For instance, in an examination of organizational communication infrastructures used by scientists, Janet Vertesi adopts notions of mess and heterogeneity. Video conferencing infrastructures and practices are rarely ever aligned. For screens to make people co-present takes constant work and effort, and it is exactly this work that is relevant for who is included and excluded (Vertesi 2014).

Finally, sociomaterial theories of organizational processes (often related to ANT approaches) start from the assumption that the roles of technologies and humans in organizational practices are relational and in constant rearticulation (Orlikowski 2010). Although screens are not explicitly theorized, two examples give an insight into how screen mediated work has been addressed. First, Barbara Czarniawska examines a press office where part of the work has been automated and screens are always present to inform journalists about the most recent global press releases. Monitors constantly display a stream of news, offering 'the opportunity to monitor what others [other journalists] are doing (...). In the old days apparently, journalists tried to figure out what the others were writing by sounding out their colleagues in face-to-face encounters. Now they can save themselves the ordeal, as well as the uncertainty about whether the information they gathered was correct or not. The screen will tell them soon enough' (Czarniawska 2012, p. 183). As in Knorr and Bruegger's work, screens thus allow for constant observation and awareness of colleagues elsewhere (Knorr Cetina and Bruegger 2002b, 2002a, Knorr Cetina 2014). However, how screened devices rearrange organizational practices depends on how the narratives framing screened devices are negotiated. Focusing on the use of smartphones, which I consider as screen mediated work here, Katrina Pritchard and Gillian Symon show that the introduction of smartphone photography to share images prompted a renegotiation about what counts as good evidence within an organization (2014). As a result, conventions about what counts as good evidence were reconfigured. So even though smartphones have the capacity to reconfigure work

practices because of their ability to take on-site photographs and to share them instantly across space, how they affect digital work depends on the organizational context.

To summarize, we can understand screens as part of the ongoing production of synthetic situations they enable and constitute; as part of embodied practices of analysis; as part of architectures of disciplinary power; as part of fragile and messy actor-networks or oligopticons; and as part of organizational processes that (re)configure screens through meaning making processes. Different roles can be distinguished: in some approaches screens are central because they are understood to have a ‘scopic’ effect. In other approaches, screens are more malleable: their roles and effects are outcomes rather than givens. This conceptual variety suggests different methodological positions towards studying digital work. I suggest that making these positions more explicit can enrich fieldwork. The next section aims to offer a resource for this methodological positioning based on research in the screen mediated environment of official statistics.

### **Methodological positions for fieldwork in screen mediated environments: insights from an ethnography of statistical practices**

Ethnographic fieldwork is often organized as one long fieldwork period (for instance, six months) and a return visit. In the case of ARITHMUS we chose to spread fieldwork at SN in thirteen visits ranging from a day to four weeks between 2015 and 2020. Spreading fieldwork allows researchers to follow projects over a longer period, and to share findings with other researchers in the project along the way. Research activities included observing everyday work, work meetings and conferences, interviewing, and collecting relevant documents. In addition, we followed mailing lists, wiki’s, and social media pages. My primary fieldwork locations were SN in The Hague, in particular the innovation laboratory, and a field office of SN in Bonaire, the Caribbean Netherlands.

Drawing on fieldwork moments and situations, this section distinguishes between five different methodological positions. These are ‘small m’ methodological positions that each present an approach to screens, including whether screens are understood to shape: the observed work practices; a particular research activity (e.g. interviewing); and the main research interest or object. In brief, these methodological positions each present a focus for conducting fieldwork in a screen mediated workspace. The central concern of the research project was how populations are constituted through everyday practices. Conceptually, it was predominantly informed by elements of ANT, particularly performativity, and ethnomethodological attention to the embodied interactions with screens in analytical work. While this take informs the methodological positions described below (mainly position 1 and 2), there is no one-to-one relationship between adopted theory and methodological positions. Instead, the ARITHMUS project shows that varying positions may be adopted depending on opportunities and observations in the field.

#### *Position 1: focus on screen interfaces as integral to digital work*

One part of fieldwork concerned interviewing statisticians about how they clean, interpret, and analyze data. Interviewing was a research activity allowing me to understand these practices in greater detail. Observations, in this instance, were less suitable because this work is generally less observable and

many of the data analyzed by statisticians are confidential. Accordingly, I conducted open-ended and semi-structured interviews. Semi-structured interviews either involved a topic list or a list of questions that guided rather than fixed conversations.

Interviewing enabled learning about the changing nature of statistical work. Familiarizing myself with the modes of analysis, data types, and everyday routines used by statisticians was a relevant part of eventually understanding how populations are brought into being through these procedures. When I first started talking to statisticians about the making of demographic statistics (e.g. birth rates), I was often told this process was almost fully automated. Many analyst positions had disappeared, and a lot of work seemed to concern updating the software rather than data analysis. To learn more about actual work processes in the context of automation I often included screen demonstrations in the interview so I would get an impression of how the software operated and how statisticians interpreted screen interfaces. A screen demonstration is an interview technique where an informant is asked to demonstrate their interfaced work (Suchman 2000). When I asked a statistician to show me how they usually checked and validated statistics before publication, the following happened:

*The statistician pointed at a few cells in an Excel file colored yellow. She explained that these cells are highlighted because the values in these cells are especially relevant to compare with those of the previous year. 'That's funny', I said, 'I was told this was all automated'. 'Automated' should be understood between quotation marks', she responded, as she continued to demonstrate how she made graphs to verify whether the statistics are correct.*

Automation, the example suggests, did not make the statistician redundant. While everyday work floor discourse emphasized the absence of 'handwork', screen demonstrations allowed for observation of the work practices that remained relevant. Through this interview technique I also learned about other details of statistical production, for instance, about the types of data included in the population register and the steps between the collection of data and publication.

The example helps to develop a methodological position accompanying this research interest: a focus on screen interfaces as integral and co-constituted with digital work. This means screens shape digital work practices (in this case analysis) and cannot be understood in isolation from them. The fact that statisticians started drawing an interface on a piece of paper (e.g. the cells of a population register) when a computer screen was not present supports this position. Because this occurred so frequently in interviews, we might conclude that many artefacts of statistical practice, such as population registers, in fact do not exist separately from screen interfaces. Consequently, screen demonstrations make interviewing easier because informants are not required to abstract their practices from their everyday engagement with screens. Being aware of the co-constitution of screens and digital practices can make interviewing easier. For instance, when I conducted an interview about the production of census statistics, it was helpful to ask my informant to explain this by walking me through the file structure (the on-screen icons of files in Windows File Explorer).

#### *Position 2: Focus on screen interfaces as constitutive of objects of knowledge*

Screen demonstrations were furthermore used to learn about the embodied processes of constituting populations: in Charles Goodwin's words, they are 'the basis of a three-dimensional work area,



something that can be touched and manipulated' (1995, p. 258). We studied the performance of population in various statistical practices, among them the integration of location data with population statistics and the analysis of data from population registers. Here I will illustrate this part of the research with a statistical project that, for the first time in the Netherlands, used internet data (URLs, website information collected through scrapers) to determine the characteristics and size of the 'digital economy'. In the following fragment from a screen demonstration a statistician explains how they compiled a database of all relevant companies:

*Scrolling through the database with companies, she pointed out 'a difficult one': hartendief.com.<sup>6</sup> 'The company number is on the website, look, but it's in English so it cannot be scraped automatically, I now have to use this number and connect to another file'. Next, she pointed at another example, Bobbakker.com, and opened the website on another screen. A 'flat' website appeared that only showed a screen size portrait picture of someone, probably Bob Bakker. 'There are so many pointless websites', she comments.*

The fragment points out that analytical work is not a purely individual cognitive process; instead, it involves talk and interaction with interfaces. Through clicking, pointing, and commenting the statistician demonstrated who is part of a population of Dutch 'digital companies' and who is not. This moment can be read as an instance of 'doing' population through interactions between bodies and screens. When a team of statisticians later convened to discuss the progress of the project, similar enactments of the population together with screens took place. On this occasion, one of the statisticians pointed at data that showed that many participants in the digital economy are small web shops. Consequently, they argued, the digital economy was characterized by a 'typically Dutch' entrepreneurial spirit – referring to an imaginary of a nation of small traders and shopkeepers. These findings are of interest because they demonstrate the integration of new data types (URLs) in the performance of population. New data types helped to extend a population of 'typically Dutch' economic actors to the digital realm.

Similar to position 1, the methodological position underlying this research practice is an understanding of screens as constitutive of digital work. Instead of focussing on understanding work practices, the main research interest here is on how certain realities come into being through interacting with interfaces. Alternatively, as I will describe next, screens can also be bracketed off from the primary focus of attention in fieldwork observation.

### *Position 3: bracketing off screens*

Another central research activity was observation. In this sub-section I discuss a passive type of observation, as opposed to participation (see position 5). Part of the research consisted of sitting at a desk in, among others, the SN innovation laboratory in The Hague and the analysts' room at Statistics Caribbean Netherlands. During these days, I would arrange my interviews, study documents and join office chat. One of the aims of 'hanging out' is to arrive at a richer, *in situ*, understanding of the routines, issues, tasks, bodies of knowledge, organizational discourses, and technologies that are part of a statistical office.

Such open-ended immersion also made it possible to identify research topics I had not determined beforehand. Fieldwork conducted at Statistics Caribbean Netherlands helps to illustrate this. The

Caribbean Netherlands are an overseas territory of the Netherlands consisting of the islands of Bonaire, St Eustatius and Saba. A field office in Bonaire collects and analyses data about the 26.000 people living on these islands using similar standards and methods to those used in the office in The Hague. At the time of a large survey, office chat developed around WhatsApp conversations among the Statistics Caribbean Netherlands fieldworkers. Some of these conversations concerned the high rate of incorrect addresses in the population register – a data infrastructure that helps determine who should be in the survey sample. In response, a statistician would consult Google Maps for the correct address of a potential interviewee or call to check their details. Data infrastructures, this suggests, do not work by themselves. Instead, what statisticians finally use is a patchwork of different data sources and workarounds to make the register operational. What is more, without this everyday work the population register could not be used in constituting the Caribbean Netherlands population. This made these small everyday acts of consulting platforms to confirm addresses political: they supported the constitution of population through registers.

Methodologically, something different is happening here compared to position 1 and 2. Even though screens were everywhere in this office, I did not take into account as constitutive of the practices I was studying. This did not mean they were not part of the field. In fact, screens were part of the social fabric. On receiving an e-mail message, some statisticians would immediately utter comments that made us part of the stream of event projected by the screens (for instance by stating ‘this is incredible’). Yet, in this part of my fieldwork the methodological position is best described as ‘bracketing off’ screens in my analysis. Bracketed off are the interactions in which screens and digital practices shape each other, as highlighted by, for instance, the ethnomethodological stance in position 2 above. Furthermore, this methodological position is not concerned with how screen mediated work is shaped through organizational negotiations, as in sociomaterial theories of organizational processes (Pritchard and Symon 2014). Instead, screens are backgrounded even though they are part of the office chat emerging through them. This example thus illustrates that we can recognize that screens are relevant parts of digital work, and yet choose a different focus. In the end, it is up to the ethnographer to decide when and how to focus on screens in line with her research objectives.<sup>7</sup>

#### *Position 4: focus on the role of screens in shaping a field site*

As is implied by the open-endedness of ethnographic observation, a methodological position can also be abandoned in the interest of pursuing different analytic directions. Continuing with the example of the Caribbean Netherlands, observing screens in yet another way can improve our understanding of our field sites. When observing video calls with The Hague from Bonaire, I learned that the room with a large screen for video calling was rarely used for any other purpose. In practice, it was dedicated to coordinating and discussing the production of statistics with the main office in The Hague. Also configuring the role of this room in cross-Atlantic coordination was the picture of the Dutch King and Queen in the same room (see figure 1). Through the presence of screens and this picture, the room was positioned as a node of Dutch central government in the Caribbean Netherlands. In SN Heerlen, a statistical office also outside of the administrative centre of the Netherlands, screens were given a similar role. Here, a set of screens was installed to always be operational, so statisticians in both locations would have easy access to each other. Pointing at the screen, one statistician explained that it was like ‘a connection to researchers on Antarctica, and Antarctica, that’s us.’

At the time of research, I did not theorize these observations extensively. Rather, they were part of my effort to improve my understanding of the power relations in a field. Looking back, however, we can think

these observations through with Janet Vertesi's work on messy and negotiated infrastructures of communication used by Spanish and American scientists (inspired by among others the ANT tradition discussed in the previous section). In her ethnography of everyday scientific work, Vertesi observes a laptop on the floor of a Spanish office. On closer inspection, an American sticker and power socket reveal that the casual scene can also be read as a location of American power established through the everyday actions and technologies that intertwine Spanish and American communication infrastructures. The case of the Caribbean Netherlands illustrates yet other, postcolonial, relations established through and with screens. In the examples discussed above, this happened not through maintaining messy, heterogeneous socio-technical relations but through the everyday usage of symbols (a photograph of the King and Queen; 'Antarctica').

The methodological position I want to highlight here is that, whether extensively theorized or not, ethnographers can also focus on screens to grasp the power relations that may be present at a field site. In this case, thinking this through helped to connect statistical institutes across the Atlantic as part of a postcolonial state system instead of thinking of them as separate field sites. A fieldwork practice may therefore also consider screens as a starting point for thinking through a myriad of intergovernmental or interorganizational relations, and thereby make it easier to understand and navigate the power relations characterising geographically dispersed organizations.

<insert figure 1 about here>

*Figure 1: room dedicated to conference calls (picture of the King and Queen on the left wall)*

#### *Position 5: focus on the making of screen mediated work*

So far, we have discussed screens as part of digital work practices. We can include them as constitutive of digital work, bracket them off or consider their role in shaping field sites. But there is another methodological position: a focus on the *making of* screen mediated work. I implicitly adopted this methodological strategy when I got the opportunity to conduct a more participative mode of observation. Participation in digital work can offer opportunities to experience the hidden, tacit, and affective aspects of this work. Through reflecting on and making sense of our individual encounters with routines, assumptions, norms, artefacts (and more) it becomes possible to generate valuable insights about a field (Hine 2015).

Over the course of several weeks, I informally and haphazardly assisted setting up statistics webinars for college and university students. Webinars were important to SN because they would allow the organization to strengthen collaboration with colleges and universities. Moreover, organising webinars through platforms such as YouTube was considered prestigious in 2016; it was seen as a characteristic of an innovative organization. But the following description of my experience in developing the webinars suggests webinars also served other ends:

*A few months into the project, my collaborators decided that a YouTube livestream was preferable to the open source platform we were using previously because it offered the possibility to display the SN logo. Now we needed to figure out how to make a livestream possible from the SN lecture hall. The current video recording system would not work, as its*

*use was regulated and could not be employed ad hoc. By contrast, a small off-the-shelf camera was used to organize a livestream that could be established quickly and on-demand: 'It needs to be professional, yet accessible for everybody'. We proceeded to test the system in an empty office. At this point, I tried to blend in the background a bit more because I became instantly aware of my limited technical skills. However, I was egged along by the statisticians. It did not matter how, as long as we all tried to make it work. Also, could I say something to the camera, so we can test it? By the end of our test, one of the statisticians pointed at the wires and duct tape we applied to the camera, exclaiming: 'Yes this is also innovation!'*

Developing the webinar not only served networking and education. The above suggests that it also performed a particular take on innovation. Through using a small camera and duct tape (see figure 4), these statisticians demonstrated what they considered as elements of an innovative organizational culture: inclusion of different skills sets and ideas, a focus on small 'do-it-yourself' projects, not saying no, and lowkey improvements. By contrast, webinars had so far been organized top-down and access to the expensive equipment was only possible on request.

To conclude, the example is about how screens are made operational in certain ways, and what this means for an organization and the culture associated with it. It points out that the making of screen mediated work such as webinars can be a relevant site of research. As a methodological position, this suggests that the making and application of screen-based practices can be studied as forms of digital work in their own right.

<insert figure 2 about here>

*Figure 2: testing a webinar system*

## **Conclusion**

This chapter discussed research activities undertaken as part of an ethnography of official statistics. I set out to take a few steps towards clarifying issues regarding the role of screens in researching digital work. In doing so, I have primarily focused on screens as material devices (computer monitors) connected to larger technological configurations.

Conceptualizing the role of screens vis-à-vis other technologies and processes in digital work practices can be challenging. From previous conceptualizations of screen mediated work we learn that it can have particular characteristics and effects. Among these are the ability of screens to introduce a temporal order by projecting streams of information; to captivate workers' attention to this temporal order; to connect geographically dispersed actors; and to mirror the actions taking by these actors. Knorr Cetina and Bruegger contend that these capabilities can support the constitution of global social forms (2002a, 2014). Another capacity of screens is to enable the analysis of complex empirical phenomena through the display of inscriptions in ways that allow for embodied interaction (Goodwin 1995, Suchman 2000, Latour and Hermant 2006). Screens therefore take part in coordinating action, but also in bringing into being objects of study and intervention. Screen mediated work can furthermore be analysed through

panoptic theories in which screens are parts of architectures of power. However, we also learn that coordination and communication through screens actually is an ongoing accomplishment best understood as always fragile and fragmentary. Finally, while screens make distributed forms of work possible, their exact role cannot be determined in advance as these are subject to meaning making and negotiation processes.

While some of these conceptualizations may correspond to particular methodological positions, there is no one-to-one relationship between how screens are conceptualized and particular fieldwork approaches. In the research project discussed in this chapter, the main theoretical starting points were performativity as conceptualized in ANT, and an ethnomethodological attention to embodied screenwork. This led to adopting a methodological position that takes into account that screen interfaces are constitutive of digital work. But I have also shown that fieldwork can be affected by unforeseen events, observations, and opportunities. As a consequence, at least five different ‘small m’ methodological positions in relation to screen mediated work emerged along the way. These included different research activities, among them passive and participant observation and screenwork demonstrations. This is not to say that these positions and research activities cover all possibilities or have always been successful. Rather, I analysed them in detail here to provide other researchers with material that can help to recognize opportunities and challenges. The practice I hope to promote is one that fosters reflexivity and analytical mobility to enrich our understanding, delineation, and constitution of a field site. For instance, being able to reflect on the presence of screens for teleconferencing in geographically dispersed government practices may enrich our understanding of the power relations shaping a field.

These insights lead to four final considerations. First, understanding the role of screens as part of distributed work practices forces us to reconsider an often-mentioned research challenge in face-to-face ethnographies: we may not always be able to observe what happens on-screen. For instance, conversations previously observable at a conference may now take place in e-mail lists. However, this chapter has shown that screen mediated work can be learned about through the relations developed as part of fieldwork. Participating in office chat, for example, offered contextualized and rich insights into the particularities of a digital knowledge infrastructure. An ethical issue is that it can be difficult to determine which parts of a conversation can and should be used as ethnographic data. Although participation in conversations can be experienced by ethnographers as a consensual mode of research, it is nevertheless relevant to ascertain informed consent before, during and after fieldwork, among others through consent agreements and sharing drafts. Second, this chapter has focused on screens as an aspect of digital work. However, this does not mean that they always need to be central to our observations, as is illustrated by the methodological position of ‘bracketing off’ screenwork. In fact, similar considerations and challenges regarding the distributed nature and complexity of digital work practices may arise with regard to other devices and knowledge practices. For instance, ethnographers interested in automation need to make a myriad decision about where and how to include algorithms in their observations. An example of a theoretical question is whether we can consider algorithms apart from data, computer hardware or even from the environments they intervene in. Methodologically, ethnographers will need to make decisions about the centrality of algorithms in their observations of everyday automation. Third, attending to screens inevitably risks excluding other aspects from our observations. Conceptualizations of screen mediated work are accompanied by visual metaphors that prioritize seeing to other senses. Being reflexive regarding our conceptualization and positioning of screens can contribute to decentering them in our research, while staying aware of their effects. Finally, the theories, methodologies and examples discussed in this section suggest that screen mediated work

is by no means a closed field of inquiry and that there is room for developing inventive ethnographic approaches that help to understand how social relations develop around digitalization.

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## Notes

<sup>1</sup> Originally published in Het Vaderland. Retrieved from the Delpher database on 8 January 2021, <http://resolver.kb.nl/resolve?urn=MMKB19:000856050:mpeg21:p00006>.

<sup>2</sup> See [www.arithmus.eu](http://www.arithmus.eu). In this chapter I mostly draw on the fieldwork I conducted at Statistics Netherlands. For more about the collaborative aspects of the project, see Scheel et al (2020). This chapter is indebted to ongoing conversations among team members, as well as conversations with participants to a workshop titled ‘Screenwork ethnographies’, conducted at Goldsmiths, University of London, on June 2, 2015. The research leading to this publication has received funding from the European Research Council under the European Union's Seventh Framework Programme (FP/2007-2013) / ERC Grant Agreement no. 615588 (Principal Investigator, Evelyn Ruppert, Goldsmiths, University of London). It was also supported by a BA-Leverhulme Small Grant (SRG\170291).

<sup>3</sup> Co-location refers to fieldwork depending on physical presence at the same site as informants, in contrast to co-presence (Beaulieu 2010).

<sup>4</sup> The degree of openness that is practiced varies. In many cases, as in ARITHMUS, several central themes and concepts are set up in advance to guide the project next to the research question(s).

<sup>5</sup> In particular to Foucault’s work on governmentality (2009), also see Scheel (2020).

<sup>6</sup> The URLs in this fragment are fictional.

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<sup>7</sup> A significant amount of ethnographic work on digital practices ‘brackets off’ the role of screens in digital work. Take, for instance, Rosenblat’s observations of Uber drivers’ embodied interactions with screens (2018, p. 52). Yet, her primary (and relevant) interest is how drivers interact with algorithms.