"The winners are those who have used the old paper form"
On citizens and automated public services

PhD Thesis

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Acknowledgments

Abstract

This thesis is a critical research study of the relations between humans and machines in a sociomaterial perspective. The case is the automation of taxes, and I see the tax authorities, the citizens, the automation, the tax rules and regulations, and the online services as entangled in a sociomaterial assemblage. The case study reports from calls to the tax information call centre, with a focus on the issues experienced by the caller. My analysis is done on two levels; the first-level analysis extracts challenging topics for the caller, and the second-level analysis identifies the manual tasks left for the citizens as residual tasks outside of the automation. The papers contribute to the analysis from different perspectives, ranging from an internal perspective of the tax authorities, via different analyses of the relations between the advisor and the caller, to a citizen perspective for alternative design suggestions.

A conclusion from the first-level analysis is that the citizens call for the advisors to help them with matching rules and regulations with events and circumstances in their lives. Citizens also call to confirm their own understanding. The call advisors explain tax topics; provide work-arounds and disentangling, in particular with complexities from interactions with other public or private agencies.

Automation generates new manual tasks. The second-level analysis identifies four kinds of manual tasks that together make up doing taxes. Some of these are redundant following the automation of taxes, some tasks are residual after the automation, and some new tasks are introduced. A companion task of "finding out" emerges together with the residual tasks. This thesis argues both theoretically and practically that the actual design of the automation determines which tasks are left for the citizens.

An alternative approach to design for human autonomy is to design coherent and understandable tasks for humans as the primary goal, instead of pushing the limits of automation. Lastly, I discuss how citizens lose their knowledge of taxes as a possible emerging performative effect of the sociomaterial assemblage of taxes.

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1. Introduction

This thesis is about the relations between humans and machines, or more precisely, between humans and automation by way of ICTs. Automation can increase both human autonomy as well as human dependence on automation. According to the Oxford Concise Dictionary (1999), "automation" means "a machine which performs a function according to a set of coded instructions". The origins of this word come via Latin from the Greek *automatos* which means "acting of itself". Constituted by a set of coded instructions, a formal construct, automation may be realised in many different ways resulting in a range of relations with humans and different spaces for human autonomy.

"Autonomy" is defined as "the possession or right of self-government" or "freedom of action", and comes from the Greek *autonomos*, *auto* and *nomos,* which means "having its own laws" and originally refers to the status of Greek city states (Oxford Concise Dictionary 1999). Autonomy is in this thesis a relational and gradual concept and is understood as a space for action and choice.

This study is part of the research project "Autonomy and Automation in an Information Society for All (A3)" at the Design Group at the Department for Informatics at the University of Oslo. The basis of the project is the interplay between automation and autonomy. A point of departure was the Norwegian White Paper "An Information Society for All" (FAD 2007) which states that "The society should provide digital solutions and tools that are suitable and not too complicated for everyone to use". The Norwegian public agencies are expected to provide electronic information and services to all citizens, designed to be accessible and useful for everyone (FAD 2007). If this objective is taken literally, what are the implications? Can such a public service really be provided for absolutely all citizens?

A starting point for the A3-project was the Norwegian automation of taxes. For many years, the Norwegian Tax Administration office has gathered data for automatically filling in tax return forms with the citizen's personal data. From 2008, Norwegian citizens have not needed to manually submit their tax return form. The automation of taxes has changed the tasks and activities that constitute doing taxes. At first sight, this may appear to increase the citizens' autonomy, enabling them to spend their time on more pleasant tasks than filling in tax forms. However, the disadvantage may be that they have a poorer understanding of tax as well as their economic situation when they no longer have to do this manually.

I will cite from the research application that led to the grant for the A3-project: "The focus on the access and use of ICT often results in simplified interaction with technology, while the more complex automations move to the background, contributing to the conceptualisation of technology as neutral tools. The obscurity of automatic systems shifts the balance between autonomy and dependency in fundamental ways and contributes to the digital divide by hampering the conditions for human autonomy. This research will focus on human autonomy, the self-determination of individuals and groups, in an information society that is characterised by increasing automation. Our main objective is to generate new knowledge and to develop new or improved digital designs for public services provision, which will contribute to the development of "an information society for all' " (A3 2008, page 1). A fundamental and far-reaching challenge to automation is the delegation of individual and social responsibility to technical systems (Velden et al. 2009).

Automation of taxes is a very interesting example of the interplay between automation and autonomy. All citizens have a relationship with the tax authorities[1], since paying taxes is both a civic obligation and a right. All citizens are obliged to report their income, fortune and other tax-relevant information to the Norwegian Tax Administration, although in practice much is reported automatically. The citizens can opt out of the activity of doing[2] their taxes, but they cannot opt out of their responsibility. The tax authorities cannot choose their clients, as commercial companies can, but will have to communicate with all citizens. Everybody has a right and an obligation to understand the basis for their tax payments – if only to enable them to argue and complain if they think something is wrong. The Norwegian democracy is based on responsible choices made by citizens with both competence and an interest in the developing society. The system for taxation of the citizens and the distribution of tax money in society are both important areas for political discussion and democratic control.

1.1 Aims and research questions

My research questions centre around three topics: the relationships between humans and automation, automation design for supporting citizen autonomy, and how automated tax functions for the citizens and for society.

- The relationships between humans and automation

My research interests are concerned with how different forms of automation co-develop with human tasks. I am interested in the fit between automation as a formal construct and the social life of humans – and how the fit develops and changes as the formal construct and the social life of humans changes as well. What are the preconditions and consequences of this fit?

How does the technology fit its use and vice versa? How do technology and its use mutually influence each other? How does the relationship between humans and automation develop?

- Automation design for supporting citizen autonomy

Design for autonomy will imply designing for supporting a space for other peoples' choices and actions. From an autonomy perspective, where should the borderline between automated processes and manual tasks be drawn? What is a good design for automation for supporting citizen autonomy?

- How automated tax functions for the citizens and for society

The case for this study is the triangle of relations between the citizens, the tax authorities and the various IT-systems involved in doing taxes. I see doing taxes as a collaborative effort between the tax authorities and the citizens, where each of them has different responsibilities and tasks. Concretizing my research questions to apply to the case of citizens doing taxes I am interested in how an automated tax system functions for the citizens and for society in general. Which and what kinds of problems arise when taxes are automated?

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[1] All citizens who have an income, have a fortune or are married to someone who has, in practice most citizens over the age of 17, have a relationship with the tax authorities.

[2] By "doing taxes", I mean the tax-related activities the citizens do, for example reading leaflets, paying taxes, gathering documentation, filling in forms, calling the tax authorities etc.

The case is schematically illustrated in Figure 1. The "fit" between automation and the humans becomes visible and accessible in the telephone calls from the citizens to "Skatteopplysningen" (SOL), the call centre of the Tax Administration[3]. The unit of analysis for my research are these calls.
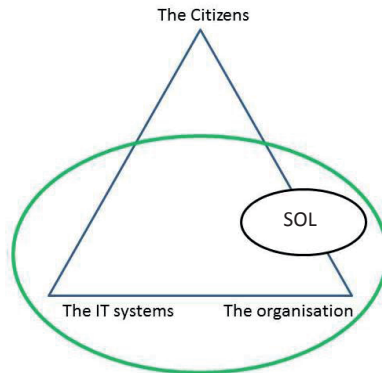
Figure 1: The triangle of relations between the citizens, the IT-systems and the organisation. The outer ellipsis indicates the organisational border of the Tax Administration. SOL, the call centre, is a unit within the Tax Administration.

The conversations between the tax advisor and the citizen reveal a gap between the fluid and often unformalised circumstances of the citizen's life and the rule-based presentations of tax. The main technique for data collection is listening in on calls from the citizens in order to get an understanding of how automated tax functions for them. I have also studied the work practices of the advisors who answer the telephone calls from the citizens in order to understand how they help the citizens and support their autonomy in various ways.

While automation delegates the rule-based, often routine parts of a complex task to a machine, it leaves the most complicated tasks that cannot be automated to a human. This is the "ironies of automation" described by Bainbridge (1983). In the analysis of the telephone calls I have looked for traces of some "ironies of automation". I suggest a different design approach that emphasises designing coherent tasks for the human rather than pushing the limits of what is possible to automate.

1.2 Outline of the thesis

This thesis has two parts. The first part is a summary of the thesis work and contains a separate analysis of the empirical material. The second part presents the seven papers that contribute to the study. The structure of the summary is as follows: Chapter 2 introduces the theoretical background of formal systems, sociomaterial assemblages and autonomy. Chapter 3 presents the Norwegian tax system and the research techniques used in this study. The first part of the analysis is presented in Chapter 4 as a description of the actors involved. The empirical data are presented throughout the analysis. Chapter 5 is an analysis of the telephone calls where I describe the issues encountered by the callers. On this basis, Chapter 6 sums up the citizens' issues as a second-level analysis of when automation is not enough. The findings are discussed and the implications both for our understanding of automation and for design

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[3] In the papers attached to this summary, I have used the acronym TICC (for Tax Information Call Centre) instead of the Norwegian acronym SOL.

for citizen autonomy are discussed in Chapter 7. Chapter 8 provides my conclusions and some suggestions for future research.

The individual papers are listed below and included at the end as appendixes. Different analytical perspectives are taken in the papers attached to this thesis. The main points and some of the discussions are integrated in this summary. I will refer to these papers in the text when more detail of a topic can be found in the paper.

Paper 1: Bratteteig, T. and G. Verne (2012a) Conditions for Autonomy in the Information Society: Disentangling as a public service, Scandinavian Journal of Information Systems (SJIS) 24(2).

This paper was selected as the main paper in the debate section of SCIS. It is about some of the activities of the advisors to help the callers. Some concepts will be presented in the theory section. My contribution in this paper is the data material, the first round of analysis and parts of the theoretical background. Further development of the theoretically based analysis is done in collaboration. In line with the tradition at my university department, the authors are listed in alphabetical order when their contributions are equal.

Paper 2: Bratteteig, T. and G. Verne (2012b) Creating a space for action within sociomaterial entanglements, Scandinavian Journal of Information Systems 2.

This paper is our response in the debate started by the previous paper. Here we elaborate our view on sociomaterial entanglements and develop our view on disentangling further. My contribution in this paper is the review of the discussant papers. The argumentation and theoretical elaboration is developed in collaboration. In line with the tradition at my university department, the authors are listed in alphabetical order when their contributions are equal.

Paper 3: Verne, G. (2013) Phone or Web? Conditions for self-service and autonomy when doing tax, IRIS 2013, August, Sanner Hotell.

In this paper I analyse the complexity of the issues of the calls to SOL. The results are used in the analysis.

Paper 4: Verne, G. and T. Bratteteig (2013) Doing taxes - between work and life, ECSCW Paphos, Cyprus.

This workshop paper is addressing the concept of "work" in using public services, which will be used in the discussion chapter. My contribution is the case and the analysis. The discussion of work is developed in collaboration.

Paper 5: Verne, G. (2014) Two faces of autonomy. Learning from non-users of an e-service, Systems, Signs and Actions, 8 (1) Special issue on "Government - citizen communication through the web".

The relation between the advisor and the citizen is the topic of this paper. Some concepts will be introduced in the theory section and used in the analysis.

Paper 6: Verne, G., and I. Braaten (2014) Participation for the unengaged, short paper, PDC 2014

In this paper we report from a participatory design process for designing tax support for

teenagers. It will be presented in the discussion section. My contribution is to conceptualise the case of young people and taxes in a context of participatory design.

Paper 7: Verne, G. (2015) What's in a Category? Learning from the Callers, submitted February 9th to ECSCW 2015
This paper is about the Tax Administration's internal registration and use of information about the calls. Some results and concepts from this paper will be presented in the discussion.

1.3 Related research

This thesis touches upon topics that are discussed in many research areas. Here I will discuss how this study relates to research about digital public services (e-government research) and about call centres. Other relevant research that is used in this thesis is presented in the next chapter.

1.3.1 e-government

From the early days, e-government plans and strategies had a triple agenda: more efficient government, better services to the citizens, and improved democratic processes (Grönlund and Horan 2005). However, achieving both improved internal efficiency and better services to the citizens can be problematic (Bertot et al. 2008). Citizen-centric e-government can be costly and may require a shift from an efficiency orientation to a user orientation to "decrease the identified gaps between government service providers and users" (ibid). Focusing on the citizens' needs and use of e-government services is a constant challenge (Heeks and Bailur 2007).

Examining different types of information or assistance that citizens can get from the government, Reddick (2010) finds that e-government is only one of many channels the citizens prefer to use. For very complicated questions, transactions, problems and urgent contact, the citizens would not use government websites (Reddick 2005). Van Deursen and van Dijk (2009) report that the expectations of the Dutch government that every citizen with an Internet connection can complete governmental assignments online, is not justified. Thomas and Streib (2003) reported that e-government users in Atlanta were younger, wealthier, more urban, better educated and more likely to be white than the average Internet user.

In the US, taxes are fully executable online, but the goal of 80% adoption by the citizens has not yet been achieved (Schaupp et al. 2010). Trust is found to be the most important factor for the citizens' acceptance of and intention to use online e-government services for doing taxes in both the US and Taiwan (Wang 2003; Schaupp et al. 2010). The US citizens' acceptance of e-filing is significantly influenced by their trust in the e-file provider (Schaupp et al. 2010).

In much of e-government research, the focus is on technical architecture or solutions, and the citizens are often approached via surveys. This is not a focus in my research as the approach taken here aims to go closer to the citizens' experiences described in their own words.

1.3.2 Call centres

Many studies of call centres focus on the emotional or knowledgeable work of the service operator of the call centre (Muller 1999; Tjora 2000; Whalen et al. 2002; Maass and Rommes 2007; Martin et al. 2007; Nyberg 2009; Svensson 2012). Some studies focus on the invisible work that the operators do in mediating the callers´ needs with the specifications and requirements of the organisation. Maas and Rommes (2007) show that flexible communication and emotional work is important for the operators to generate a good interaction with the customers. Svensson (2012) found that the operators tried to read the emotional state of the callers to an emergency call centre because fearful and negative emotions expressed by the callers indicated a high need for help. The capability to delineate symptoms from non-symptoms depends on the operator´s communicative competence as well as organizationally provided routines for triage at an emergency call centre (Svensson, ibid).

Muller (1999) showed that the directory services operators' expertise and knowledge about their work added value to their customers' queries. Making the operators' contribution visible led the management to abandon a plan for full automation of these services. Whalen and Whalen (2002) suggest that the nature of the operators' work can be described by the seemingly contradictory notions of both improvisation and choreography, indicating that the work routines are a craft-like performance.

Classification work for categorizing the callers or their requests is abundant in call centres, both for the internal records and for directing marketing efforts towards the caller (Martin et al, 2007). Inspired by Bowker and Star (1999), Martin et al (2007) describes the invisible work of the operators with making a general classification scheme "fit" into the local arrangements.

Nyberg (2009) analyses the call centre as a sociomaterial entanglement of human and technological agency. During the customer call, the computer system, the operator, the operator´s keyboard, the screen, and the telephone "all became one figure in relation to the customer" (Nyberg 2009). Applying the theoretical notion of "agential cuts" within the entanglements, agency is located with non-human actors, for instance the computer that introduced errors in the customer record in the database and in this way influenced the work of the operators (see Section 2.5 for an explanation of "agential cut"). Tjora (2000) shows that the guide used by nurse operators at medical emergency call centre mediates the responsibilities and work distribution between the nurses and the medical doctors. Use of the guide allowed the nurses to exercise more autonomy in their work situation and to make diagnoses that otherwise would be the responsibility and competence of the medical doctors.

SOL differs from the call centres described in the research literature in several ways. SOL is neither a commercial nor an emergency call centre. Doing taxes rarely generates acute situations where some kind of emergency is involved, in contrast to the emergency work described in Pettersson et al. (2004) or Svensson (2012). Coordination between the advisors within SOL during calls is rarely necessary, although it may happen that one advisor asks a colleague while the caller is on the line. The advisors are neither selling products nor services to the callers (Martin et al 2007). SOL advisors do not use scripts to structure their communication with the callers (Martin et al 2007, Tjora 2000). There are no formal roles assigned to the advisors to differentiate their answering work (although some advisors have responsibilities as super users of the various IT systems used by SOL and may have to answer questions from the other advisors about their system). Although the advisor's answering work is monitored and measured, normal working conditions for Norwegian civil servants apply.

There is no total control from the management of the call centre through the technology used by the advisors (Fernie and Metcalf 1998). SOL and the work of the tax advisors will be described in the first analytical chapter, Chapter 4.

2. Theoretical background

In this chapter, I will present the theoretical background for this study. First I will describe how I understand automation, and then I will present my take on the Suchman-Winograd debate about categories used for communication. Following this, I present theory on classification and categories before I go on to the topics of human and computer agencies, and sociomaterial assemblages. I end this theoretical chapter with a brief presentation of the work to make automation work, and autonomy.

2.1 Automation

The Turing Machine is an abstract definition of automation defined as the execution of a set of coded instructions (Turing 1936; Minsky 1972). Alan Turing (1936) described a formalism for a theoretical machine designed for exploring the nature of and limits to computations and computability. The Turing machine in its most basic form reads a 0 or 1 from a tape which is infinite both to the left and right, and depending on which state the machine is in, writes a 0 or 1 on the tape and changes its internal state. The tape is moved to the left or right. This sequence continues until the machine halts. However, it cannot be determined if the machine will halt or not.

The Turing machine has had an important role in theorizing the limits of computability. Minsky (1972) states that "the structure and behaviour of these machines is easily described *completely*, without any ambiguity and approximation. It is much harder to deal with more realistic models of mechanical systems, in which variable quantities like time, position, momentum, friction, etc., vary smoothly over continuous, imperceptibly changing ranges of values"[4] (Minsky, ibid, p 11, original emphasis). It can be mathematically proved that the formalism of a Turing machine is computationally equivalent to other formalisms for expressing algorithms (Minsky 1972; Sipser 2013).

The algorithms to be executed by a theoretical Turing machine or a modern computer are defined by programming, which "amounts to *determining in advance* everything the computer will do" (Minsky, p 103, my emphasis). However, in a footnote, Minsky adds that "It is important to note that this does not mean that the person who writes a computer program understands all the consequences of what he has done!" (ibid, p 104).

Complex computations (or algorithms) can be built from basic ones. To have an understanding of the machine as a whole, one will need to have some degree of understanding of the constituent parts.

Computer programs are built of layer upon layer of abstractions, which imply creating categories and classifications, both for internal purposes for the structure of the program, and for external purposes related to the input and output (Winograd 1994; Bratteteig 2004). To represent anything at all in a computer program it will need to be conceptualised and categorised. The process of categorisation "relates the use context with the computing machinery in profound ways and at several levels of abstractions" (Bratteteig 2004, p 215).

Modern computers operate within the same theoretical restrictions for computability, and are in this respect no more than Turing machines. Every operation that can be done on a

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[4] Minsky's statement applies to finite state automations, which he later in the text proves to be equivalent to a Turing machine in expressional power.

modern day computer could in theory be computed by a Turing machine – if practical and temporal aspects were set aside.

Cummings (2004) describes levels of automation that range from full automation where all decisions are made by the computer programs, to minimal automation where the computer only makes recommendations or filters information. Cumming's ten levels of automation are:

1. The computer offers no assistance: human must take all decision and actions.
2. The computer offers a complete set of decision/action alternatives.
3. The computer narrows the selection down to a few.
4. The computer suggests one alternative.
5. The computer executes that suggestion if the human approves.
6. The computer allows the human a restricted time to veto before automatic execution.
7. The computer executes automatically, then necessarily informs humans.
8. The computer informs the human only if asked.
9. The computer informs the human only if it, the computer, decides to.
10. The computer decides everything and acts autonomously, ignoring the human (Cummings, 2004)

Full automation delegates decisions to the computer, and implies that all relevant information and its importance for making a decision is known at the time of programming as there are no openings for a human decision maker during its execution. When programming computers to do automatic decision-making and case handling in a public administration, it will be necessary to pre-determine the outcome of future cases (Schartum 2014).

2.2 The Suchman-Winograd debate

At the ECSCW conference in 1993, Lucy Suchman presented her paper "Do categories have politics? The language/action perspective revisited" and stirred a debate. Suchman's paper was formulated as a critique directed to Winograd et al's communication system THE COORDINATOR described in Winograd and Flores (1986). Suchman's paper was slightly revised and published the year after in the CSCW journal together with a reply from Terry Winograd titled «Categories, Disciplines, and Social Coordination»   (Suchman 1994a; Winograd 1994).

THE COORDINATOR was structured according to categories from speech act theory that represent the intention of a message (Austin 1962; Searle 1969). Those who used it for communication had to make their intentions explicit before sending a message. Suchman (1994a) argues that speech act theory adopted as a structure for human communication and used as a foundation for system design carries with it an agenda for discipline and control. Speech act theory studies the actions performed by speech. Language use is analysed into categories for the various actions performed, such as an order, a request, a threat etc. For example, pronouncing "Shut the window!" may be an order, a threat, a permission or a consent, depending on the context around the utterance (Austin 1962, Searle 1969).

The communication tool THE COORDINATOR was structured on the basis of Austin's categories. When speech acts were used as a structuring device for this communication system, the users would have to choose a category explicitly for their message, which implied that the intention behind an utterance had to be made explicit. For instance, a user could

categorize a message to a colleague as a «request for action» when she was asking the colleague to do some task.

Suchman (ibid.) contrasts this use of the categories from speech act theory with Sacks' view of categories as expressing identity (Sacks 1979, in Suchman 1994a). Sacks studied young people who used categories to describe themselves or others. These categories were invented by the young people themselves; for example, the identity of being a «hotrodder» was used as a revolutionary category among this group of young people. Their categories expressed their identity as different from others, and they had ownership over these categories.

Suchman's argument is that these young people created the categories themselves, and chose categories that best expressed their own view of themselves and others. In contrast, the users of THE COORDINATOR had to choose from predefined categories to express their communicative intentions, and had few if any opportunities to take ownership of these categories.

Suchman's use of the notion «discipline» in her critique involves only a limited and predefined set of categories being made available to the users. These categories are predefined by the system designers, and the users have no control over the available choices. Because they will need to choose a category before sending the message, they will need to make their intentions explicit at the outset. They are deprived of letting their intentions emerge in a communication situation with more social and cultural resources available. Suchman is using the notion of "discipline" in a Foucaltian sense as a means to administer issues of power (Foucalt 1979, in Suchman (1994a)) and saw the predefined set of categories of THE COORDINATOR as «an externally imposed regime of institutional control» (Suchman 1994a, p 188). Her central concern is «how our relations to each other are ordered and by whom».

In his reply, Winograd (1994) argued that Suchman (1994a) had misunderstood what it means to use a theory such as speech act theory as a basis for system development. He argues that there is a difference between models of behaviour and formal structures used for communication. Creating and using categories are inherent in all kinds of software development, not only for communication systems. The categories from speech act theory are merely used in THE COORDINATOR as a structure that will provide resources for human communication. Forcing the users to explicitly state their intentions by choosing a speech act category will give a necessary uniformity in a communication situation where vagueness and ambiguity cannot be resolved by personal contact, for example in a large organisation. He argues that some kind of discipline and standardisation will be necessary for cooperation, and exemplifies with the standardisation of accounting. Accounting can only function for a group of people if the categories to represent different kinds of costs and incomes are standardised.

Winograd describes discipline in communication and in software development as valuable and necessary, and takes a pragmatic view of categories as a neutral structuring tool. He concludes that people «will adapt and reinterpret whatever they find in their environment, and they will do so in ways that simultaneously reproduce the existing social structure and create a clearing for social innovation» (Winograd 1994, p 196).

In her reply to Winograd and others, Suchman elaborates on her position (Suchman 1994b). Her focus is on the ownership of the formation of categories, both the creation and the selection in use, and that these are not defined by someone outside the group of those who will be categorised by them. She argues that managerial concerns for efficiency and control are in focus in THE COORDINATOR, implying that THE COORDINATOR is not a «neutral» tool

for communication. In line with Winograd she thinks that design will always implement someone's perspective, and argues that this should be part of an open debate. She strongly emphasizes that her critique concerns who defines and has ownership of the categories people will need to use, what gets categorized, and how freely members of a social group can use social and cultural resources in choosing a category that describes their communication or their identity.

This debate touches upon an important aspect of autonomy. Underlying questions are, firstly, to what degree is a person able to take ownership of the categories that will describe his or her communication or identity, and secondly, to what degree is not being able to take such ownership a pragmatic necessity when designing computer systems, as Winograd argues, or an enforced discipline, as Suchman argues. In my view, Suchman (1994a, 1994b) and Winograd (1994) are talking at cross-purposes as they focus on different aspects of creating and using categories.

Winograd (ibid) argues from the position of a software developer who knows that one cannot avoid choosing between or making categories when programming, and that users will negotiate these and develop workarounds. Suchman (1994a, 1994b) argues that when the users of THE COORDINATOR need to select the intent of their communication in advance, from a set of categories enforced from the outside, they are deprived of using social and cultural resources to clarify this *during* their communication. Their views may be reconciled by accepting both Winograd's argument that software development implies making and using categories, and Suchman's invitation to an open debate about which categories and who should create them.

2.3 Classification and categories

Students studying programming learn to make and use categories as a practical programming necessity. That categories are not neutral is not part of a standard computer science curriculum. One of the most important books I have read is entitled "Sorting Things Out: Classification and its Consequences" (Bowker and Star 1999). It increased my already growing interest in the meeting between the formalised and the unformalised, the rationalistic and the messy (Verne 1983).

Bowker and Star (1999) define a classification as "a spatial, temporal, or spatio-temporal segmentation of the world". A classification system is a set of literal or metaphorical boxes – the categories – where phenomena or things can be put to do some work. This work can be knowledge production or serve bureaucratic purposes. A classification system is defined with the following properties:

1. There are consistent, unique classificatory principles in operation. For example, sorting correspondence by date received, would be a classificatory principle.
2. The categories are mutually exclusive. In an ideal world, categories are clearly demarcated boxes, into which the objects classified by the system will uniquely fit. For example, there will only be one mother and one father to each child in a family genealogy system.
3. The system is complete. The ideal classification system provides total coverage of the world it describes. For example, a botanist discovering a new plant will strive to find a place and a name for it within the existing classification.

In practice, no classification system will live up to these ideal requirements. The classificatory principle will be supplemented in various ad hoc ways. Mutually exclusive categories may be impossible in practice, as there will often be ambiguity or disagreement about some object's membership in some categories. Bowker and Star illustrates with the example of when an individual's life begins. There is no agreement between catholic and protestant nations about what defines a live birth. Completeness may not be possible as there may be economic or political reasons for not including new discoveries into a classification system.

Categories may be used informally, without the support of a classification system to give them a definition and internal consistency. A collection of categories can be understood as a nomenclature if there is no underlying classificatory principle (Bowker and Star, 1999).

Historical and political circumstances will play a part in the creation and maintenance of categories.

2.4 Categories and identity

Being defined from the outside is also a topic in Bowker and Star (1999). Many people live a life characterised and influenced by descriptive categories that are not of their own selection. One example is that the condition and future prospects of tuberculosis patients at a sanatorium were defined in vague terms by the doctors. The patients had to live with doctors' decisions, but had little influence over their own lives. Another example is how the classification into racial categories were shaped by and shaped people's lives in apartheid South Africa. Bowker and Star show there is work involved in trying to either fit in or transgress racial categories – and there was suffering for those who experienced that the categories assigned by the authorities did not fit their individual identity.

Categories as expressing identity are discussed from the perspective of residual categories in Star and Bowker (2007), which is about the consequences of not fitting in. Residual categories "are those which cannot be formally represented within a given classification system". Everybody will inhabit residual categories under some conditions. A social order may move its classification of persons because of social movements or pressure groups, for instance as a result of the feminist or gay movement. Silences surround the residual categories and the conditions of those who inhabit them. Being residual involves costs and ongoing work. You need to learn how to do it.

There is also work at the juncture where people's experience meets category systems, and this work is often invisible or repressed (Star and Strauss 1999). Power is exercised in devising categories that structure other people's lives (Bowker and Star 1999). The authors state their ethics as taking people seriously on their own terms, in their own words. This is beautifully formulated as "each person's lived experience is sovereign and inalienable. One person's story is as good as another's " (Star and Bowker, 2007). There is no privileged position. This is in line with the view taken in this thesis.

2.5 Human and machine agency

The relationships between human and machine agency are studied under the trope "plans and situated actions" by Lucy Suchman (1987, 2007). A starting point for her PhD-study was

"how capacities for action are figured at the human-machine interface and how they might be imaginatively and materially reconfigured" (Suchmann 2007, p 2). She gave serious consideration to claims from Artificial Intelligence researchers at that time about "human-machine interaction" and studied these as she would have studied human-human interaction.

At that time her employer, Xerox PARC, had installed a new photocopying machine with a so-called «expert system» at the interface. The interface was based on scripts for the interaction between the user and the machine. These scripts were based on an understanding of human cognition as consisting of setting up goals and following plans to achieve the goals. However, Suchman observed that quite often the user did not act according to the expectations that were built into the scripts, and often the script failed.

Based on these observations, she criticizes the view that humans act according to preconstructed plans, and argue that humans act according to embodied interactional competencies which are strongly situated (Suchman 2007). Her analysis illustrates that when a highly formalized, predetermined script meets the contingencies of a human's actual use, the script may behave so that the humans do not succeed in their task. The human users of the copying machine had to guess what the machine expected of them to be able to continue the copying and succeed with their task. We can recognize her argument from the debate with Winograd against having to define intentions or plans explicitly in a set of categories defined from the outside, prior to the action (Suchman 1994a, 1994b).

The discussions in Suchman's work focus around two approaches to human intelligence and action: the plans and the situated action. The plan is described as a more or less structured, largely predetermined plan for human action. The situated action is what the human actually does, using natural, cultural and social resources that may be available during the action. The plan may act as one of these resources. There will often be a distance between the pre-determined plan and what is actually done. The plan will be underspecified as it cannot capture all contingencies and unexpected occurrences that will emerge during its execution (Suchmann and Wynn 1984; Suchmann 2007).

The initial discussion with the Artificial Intelligence research community is visible throughout and flavours Suchman's (2007) arguments. Her critique of the plan as directing human actions without any access to social and cultural resources during the execution concerns the scripts for human action implemented in computer programs. These scripts are necessarily predetermined and are not open for unforeseen human intervention. Her notion of a plan comes from the machine that executes the script and only has access to a predetermined set of resources (or parameters). Suchman describes the machine's access to external resources during its execution as what can be seen through a narrow keyhole of what it is programmed to detect, like the copying machine that only has access to information about the user when he or she opened or closed doors, put in more paper etc. The observation of an attempt to use the copying machine where the script ended successfully but the users had not achieved the result they wanted, illustrates this situation. Suchman's book (2007) is about computer programs that are not open for human intervention except through a limited set of predefined "interactions". A citizen who interacts with online services from a public agency will be in a similar situation.

2.6 Sociomaterial assemblages

Suchman (2007) provides a critique of the representational view of human and machine agency, and argues for a performative view. Human and machine agency are not understood as existing a priori and separately as properties of humans or machines, instead they are seen as mutually constituted in a sociomaterial assemblage through particular, "more and less durable" arrangements. Agencies of subjects, objects and the relations between them will emerge as effects from these durable and contested ongoing sociomaterial practices. Suchman (2007) builds on the works of Barad (2003).

Suchman (2007), Barad (1999, 2003) and Pickering (1995) have been inspirational for other scholars doing research from a sociomaterial perspective. The intimate tangle of material/technological and human agency is the focus of scholars studying sociomateriality. Different notions are used: Technologies, people and organizations are seen as mutually constituted in a sociomaterial assemblage (Suchman 2007), an imbrication (Sassen 2002; Leonardi 2011) or an entanglement (Orlikowski 2007, 2010; Orlikowski and Scott 2008).

The sociomaterial perspective opens up for a more detailed study of the entangled nature of the relations between technology, people and organization. In particular, it opens up for studying technological agency without resorting to a technological determinist perspective (Orlikowski and Scott 2008). I will use these notions to theorize tax as a sociomaterial assemblage for a discussion of the technological agency of automation.

2.6.1 Entanglements

"Entangle" means to wrap or twist together or to cause (something) to get caught in or twisted with something else, or to involve in complicated circumstances (Oxford Concise Dictionary 1999). Based on the physicist Niels Bohr's work, Barad (2003) uses this notion to discuss quantum entanglement. She emphasizes that a human observer cannot be separated from the phenomenon he or she observes, but will be entangled with the object of observation. Barad argues along the same lines as Pickering (1995), that the phenomenon we observe is entangled with the apparatus for observation and with us as observers. The conceptualization of a phenomenon as an entanglement comes from our perceptions and understandings, and is not to be understood as an ontological reality (Barad 2003, footnote 9).

Pickering gives the example that quarks come into existence as a result of a particular set of physical experiments where the quark is mutually constituted with the apparatus for observing the quark (Pickering 1995; Barad 2003). The entanglement is a "mangling of human and material agencies". "The mangle operate[s] … at a level of detail not usually accessible to empirical study", says Pickering (1995, p. xi), and opens up for studying technological agency in detail within a sociomaterial assemblage. Orlikowski (2007) describes how technological detail is involved in sociomaterial entanglements, drawing on the Google Page Rank algorithm and the Blackberry email push functions as examples.

In a sociomaterial entanglement, technological and human agencies are seen as mutually constituted, and they can only be separated analytically. To be able to talk about human or technological agencies, subject or object, an analytical separation between these two notions for agency must be made, called "the agential cut" (Barad 1999). The agential cut is a constructed cut which defines how we "choose" to separate human and technological agencies in a particular case. To be clear that we are working *within* a sociomaterial entanglement, the notion "intra-action" is used (instead of "inter-action", which presupposes separate agencies).

An example is from Nyberg (2009), who with the help of an agential cut located technological agency to a database that influenced the operators' work in the call centre (see Section 1.3.1).

2.6.2 Disentangling

Bratteteig and Verne (2012a, Paper 1) analyse doing taxes as citizens interacting[5] with the sociomaterial entanglement of tax rules and regulations, technology, and human tax advisors. To do their taxes, citizens need to act within this sociomaterial assemblage, which can seem rather overwhelming. In situations where the citizen cannot find out what to do, the advisors at SOL provide help by *disentangling* the situation for the caller. Disentangling opens up a space for action and may suggest steps for the caller to take. In relatively simple cases, the advisor can point to a next step for the caller to take. In more complicated cases, when the issue at hand cannot be solved directly, the advisor will reduce complexity by suggesting actions for the caller that may lead to a next step.

Disentangling is a pragmatic concept that focuses on opening or creating a space for change by taking a next action step. It is not the same as the "agential cut", which is an analytic concept aimed at choosing a particular working division between technological and human agencies in a particular setting. It is about seeing the whole and the part together as a basis for making a change. By changing a part, one can influence the whole; however, not in a deterministic way. If a sailor wants to increase the speed of her sailboat, she has a set of options available within the sociomaterial assemblage of the sailboat, the wind, the rudder, the sails, and the current. The choices will be neither arbitrary nor given. They will depend on her competence, her target, her passengers (how much tilting of the hull can they endure?) and so on. By disentangling this entanglement, she may decide to trim her sails by pulling the sheets. Her attention will focus on how the boat moves after this adjustment, and she can choose to reverse or change her action again. Disentangling may also open up for alternative designs of technology that will alter a sociomaterial assemblage in a wanted direction (Bratteteig and Verne, 2012 b, Paper 2).

Disentangling reduces the complexity of an entanglement, which may be nested and appear on different levels and with different degrees of complexity. Bratteteig and Verne (2012b, Paper 2) argue that an entanglement is more entangled than an imbrication, which can be resolved in a stepwise fashion. An entanglement can potentially be disentangled into an imbrication. The relations between an entanglement and an imbrication are elaborated in detail in Bratteteig and Verne (2012 b, Paper 2, Paper 2).

2.6.3 Performativity

The notion of performativity can be traced back to Austin's speech act theory, where a verbal utterance has performative effects and changes some relationships in the world. For example, if I say, "It is cold in here", and someone closes the open window. Another example is that a couple is married when the registrar utters the words "I hereby declare you man and wife" in particular conditions (Austin 1962). In the last example sentence, reality becomes aligned with the representational content of the utterance. Within a sociomaterial entanglement, performativity is an emergent outcome of entangled agencies.

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[5]To increase readability, I will in the following use the more familiar term "interacting" instead of the more correct "intra-acting".

Performativity of information systems has been a topic for scholars within Information System research. Boell and Cecez-Kecmanov (2012) reject a representational view of information systems and argue that an information system must be understood as an apparatus in Barad's sense which both re-present and enact reality. The apparatus is performing reality (Boell and Cecez-Kecmanov 2012). Performativity is used to describe when human and material agencies align and "reality" is co-constituted together with the representation of it in the information system (Orlikowski and Scott 2008).

In his book with the beautiful name "An Engine, not a Camera", MacKenzie (2006) asks whether the Black-Scholes formula for option pricing had performative effects. This formula for calculating option prices was based on assumptions about the stock market that did not hold. However, as the actors within this market started using the formula for estimating option prices, the markets were changing and became more like the formula's preconditions than they were before. The book's name indicates that the formula did not function as a static snapshot of a situation; it was more like an engine developing the situation.

Another description of performativity can be found in Bowker and Star (1999), where the notion of *convergence* is used to denote the "double process by which information artifacts and social worlds are fitted to each other and come together" (Bowker and Star 1999, p. 82). They cite a psychiatrist Young (1995, in Bowker and Star 1999, p. 4) who makes the "observation that psychiatrists increasingly use the language of the DSM [the classification system for psychiatric diagnoses] to communicate with each other and their accounting departments, although they frequently do not believe in the categories they are using". These categories do not necessarily reflect the lived experiences of the practitioners; however, only what can be seen through "the narrow keyhole" (Suchman 2007) becomes everything there is.

Leonardi (2012) explains performativity as "technologies exercise agency … through the things they do that users cannot completely or directly control" (p. 6). He gives the example of a compiler that translates program code from a source programming language to a target language without input from its user. In this definition of performativity, computers do things without human intervention. Leonardi's definition of performativity is weaker than the notion used by Pickering (1995), Barad (2003), Boell and Cecez-Kecmanov (2012) and MacKenzie (2006), where performativity is that reality becomes aligned with its representation. I take Bowker and Star's notion of convergence also to mean this stronger notion of performativity in that it specifies a mutual adaption between the information artifacts and the social worlds (Bowker and Star 1999).

I will use this strong notion of performativity of the sociomaterial assemblage of doing taxes to discuss the relation between the citizens and the automation of tax.

2.6 The work to make automation work

The academic field of Computer Supported Cooperative Work (CSCW) studies work-related, collaborative practices associated with using computers, with a focus on how technology works in practice. The discipline "should be conceived as an endeavour to understand the nature and characteristics of cooperative work with the objective of designing adequate computer-based technologies" (Schmidt and Bannon 1992, p 3). The research area is heterogeneous and interdisciplinary (Schmidt and Bannon 2013).

Both *work* and *cooperation* are central notions in CSCW. This research field sprang out of the need to study more than one single user in front of one computer and how computers could support actual cooperative work settings (Bannon and Schmidt 1991; Schmidt 2011).

An important discussion within CSCW is how the W in the acronym should be theorized. Originally "work" was understood as paid work taking place in a workplace such as an office, a factory, or mobile work (Schmidt 2011). Different arguments challenge this understanding, for example are there many work-like aspects of other activities such as art performances, which is work for the artists and leisure time for the participants (Crabtree et al. 2005), home care, which is both paid and unpaid work taking place in the home (Bratteteig and Wagner 2013), gaming (Nardi 2010) or doing taxes, which is neither paid work nor leisure (Verne and Bratteteig, 2013, Paper 4).

CSCW research understands the use situation and the user's actual work practices as a prerequisite for technology design. Many scholars within the discipline work ethnographically inspired to study actual practices (Blomberg and Karasti 2013). The dominating research approach has a long history in CSCW where "ethnographic and other forms of in-depth workplace studies play an essential and proactive role" in technology development. A key strategic goal of CSCW is to build a corpus of ethnographic and other workplace studies (Schmidt and Bannon, 2013).

Schmidt (2014) defines a work practice is a regularly occurring activity that is constituted by certain rules and principles that is adapted to the changing contingencies of the actual work situation. A work practice is performed as a unity of theoretical knowledge and practical work. Mastering a practice is exactly the knowledge that makes it possible to adapt the practice to the changing conditions that meets the actual work situation (Schmidt 2014).

There are a few examples of studies of meetings between the citizen and public administration or a civil servant (Borchorst and Bødker 2011; Borchorst et al. 2012). Common to all of them is that the perspective is close to the actual practices of the encounter.

Borchurst and Bødker's (2011) study is close to this topic. It describes the case of an online tool for childcare planning as collaboration between the citizen and the municipal administration. Borchorst et al. (2012) found that in service encounters between the citizen and the bureaucracy, the citizen performed adequate identities to fit within the system and be eligible to particular services. The strategies the citizens employed are "attempts to deal with the gaps that citizens experience between their messy and constantly changing realities, deeply intertwined with many other human actors, and the inflexible, though not well-understood, criteria for identification required by the systems and procedures" (Borchorst et al. 2012).

2.7 Autonomy

In a sociomaterial perspective autonomy is understood as an emerging performative effect of an assemblage rather than a property of humans or machines. The social nature of autonomy is present in that autonomy is enacted in (more or less) durable sociomaterial practices (Suchman 2007). In the literature, the notion of autonomy is used very broadly: "It is used sometimes as an equivalent of liberty .., sometimes as equivalent to self-rule or sovereignty, sometimes as identical with freedom of the will. It is equated with dignity, integrity, individuality, independence, responsibility, and self-knowledge" (Dworkin 1988). Being described by a category not of your own choice, can be repressive and challenge

autonomy of different kinds. Racial classifications could hamper free movement and education for some people and delimit their autonomy (Bowker and Star 1999).

There are many forms of autonomy, and Dworkin (1988) makes a point that liberty and autonomy are not the same. He gives an example of Odysseus in his boat approaching the treacherous sirens. He ordered himself to be tied to the mast so that he could hear the sirens' song, and the rest of the crew to plug their ears. By denouncing his liberty on purpose, Odysseus was increasing his autonomy so he could achieve his goal of listening to the sirens' song.

Feminist scholars have criticised the dominating individualised understanding of autonomy, which glosses over human social relations and interdependencies. Mackenzie and Stoljar (2000) suggest a relational notion of autonomy, which opens up for studying the social relations that make autonomy possible. "Relational autonomy" is not a unified conceptualization, but rather an umbrella term designating a range of perspectives that share a conviction that persons are socially embedded. Identities are formed within the context of social relationships and intersecting determinants such as race, class, gender and ethnicity.

As one example of social embeddedness, Code (2000) suggests advocacy relations as a prerequisite for autonomy. "Advocacy" means "support" or "defence", and is derived from Latin *advocare*, which means "call to one's aid" (Oxford Concise Dictionary 1999). In this respect, autonomy is not about making choices in individual isolation. Instead, the social and relational nature of being able to make good choices for oneself is highlighted. An element of care for others' concerns and life conditions is built into the definition of relational autonomy. The notion of relational autonomy is presented and discussed in more detail in Verne (2014, Paper 5).

Being able to exercise agency is an important aspect of autonomy. Bratteteig and Verne (2012a, 2012b, Paper 1 and 2) discuss autonomy as a space for action and choice to improve one's life conditions. A relational understanding of autonomy opens up for analysing the call advisors' work as giving help and advice that will enable the callers to make good and beneficial choices that may improve their life situation. The advisors are supporting the callers' autonomy.

Analysing how the call advisors help the callers to SOL, Verne (2014, Paper 5) builds on the notion of advocacy relations and identifies two kinds of support for the caller's autonomy: *do-it-yourself autonomy* (enabling individual space for actions) and *duke autonomy* (assisting an individual by performing acts that they cannot or will not do themselves). The advisors support the do-it-yourself autonomy of those callers who they believe will want to solve their issue themselves, for instance by providing information so the caller can use the online self-services. This caller can solve similar issues herself in the future. For those callers who seem to need more personal help, and who risk adverse economic or other tax-related conditions if they do not manage themselves, the advisor provides more direct help. The caller is served like a duke if there is a risk that he is unable for example to change the basic information of his tax card himself, and the advisor does this on his behalf, thus improving his economic situation. The advisor supports their duke autonomy. A duke receives services and support from others without his autonomy being threatened.

3. Case and method

3.1 About taxes in Norway

Tax in Norway is widely automated (Wroldsen 2008). Issuing a tax card for advance tax payments, advance tax withholding, information gathering, calculation of taxes, and refunding of excess tax payments take place automatically for most Norwegian citizens. The tax authorities gather information about citizens' income, assets and deductions made by employers, public agencies, banks, insurance companies, municipalities, NGO's and others, and calculates the tax based on these figures. Employers withhold advance tax from employees' salaries and transfer it to the tax authorities. Based on such information the Tax Administration creates a pre-completed tax return form that is presented to each citizen, either on paper or online – depending on choices made by the citizen[6]. If this corresponds with the citizen's own figures (or own expectations) the citizen may do nothing, indicating their "silent consent" to the tax authorities' pre-completed tax return form. The citizen can make changes online or on paper, and will in this case have to submit the tax return form explicitly.

Previously, the citizens had to gather personal tax-related data, enter the figures by hand onto the paper-based tax return form, sign the form, and submit it personally or in the mail to the tax authorities. Figure 2 shows a tax return form from 1967, filled in by a citizen by hand in blue ink.

Figure 2: A tax return form from 1967 filled in by hand.

Figure 3 a and b shows a tax return form from 1988. It is still filled in by hand. The form is in two pages which are shown in large scale so that the numbers of the items are visible. The structure and internal relations of the tax rules are visible through the structure of the items of the form. The items are numbered, and items that are not in use are visible for the citizen to see. The sequence of calculations forming the basis for taxation is visible as a structure of the items on the form.

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[6] In 2014, after the fieldwork was finalised, the Norwegian Law "Forvaltningsloven" was changed so that the Tax Agency can distribute the electronic tax return form to most citizens unless they explicitly choose the paper version (Forvaltningsloven, §15 a 1. ledd).

Se rettledningen om hvordan De
skal fylle ut de enkelte postene
Skriv fødselsnummer på alle bilag til selvangivelsen

Selvangivelse 1
For personlige skattytere   Inntektsåret **1988**

Personopplysninger

	Selvangivelsen sendes ligningskontoret i	Til bruk for ligningskontoret
	0301 OSLO	0 1

Fødselsnr. (f.dato - personnr.)

Bopel og postadresse 1. november 1987: *OSLO*

Bopel og postadresse 1. november 1987	Stilling	Telefon	Sivilstand (sett X)	
samme	*programmer ti*	Privat / Arbeidssted	Gift / Ugift	✕ Skilt / Separert / Enke (-mann)

Ektefelle

Ektefelles navn	Ektefelles fødsels- dag. -md., -år	Sender ektefellen egen selvangivelse?	
		Ja	Dersom ektefeller leverer hver sin selvan- givelse, velger ligningskontoret den lignings- måte (særskilt ligning eller felles ligning med fordeling av skatten) som gir lavest samlet skatt. Det skjer uten noe krav fra Dem. Krever De en bestemt ligningsmåte selv om den fører til høyere skatt, vennligst gi opplys- ninger under merknader eller på eget ark.
		Nei	

Har De giftet Dem etter 1. november 1987? Oppgi i så fall datoen, ektefellens skattekom- mune og nettoinntekt.

Ektefellens navn og boligadresse før ekteskapet (fylles bare ut hvis ekteskapet er inngått etter 1. november 1987).

Barn og andre som De forsørger

	Navn (og evt. bopel)	Fødselsdag. -md.-år
Barn, adoptivbarn, ...e- og fosterbarn i 1973 eller senere		

Hadde noen av disse barna formue pr. 1.1. 1989 eller har noen av dem hatt inntekt i 1988?   Ja   ✕ Nei

Er noen av barna i institusjon eller hos fosterforeldre som mottar barnetrygden? Gi i tilfelle nærmere opplysninger.

Påse i tilfelle at denne formuen/inntekten er med i Deres eller ekte- fellens selvangivelse (se rettledningen, avsnitt C). Arbeidsinntekt som barnet skal lignes særskilt for, oppgis i egen selvangivelse for barnet.

Har De fellesbarn med samboer? Oppgi i så fall samboers navn og fødselsnummer: Ja   ✕ Nei

	Tidsrom for forsørgelsen	Inntekt	Evt. skoleart og klassetrinn
Barn, adoptivbarn og pleie- barn født i 1970-72 og fosterbarn født i 1972 som De krever forsørgerfradrag for			

Andre som De har for- sørget i 1988 og som De krever særfradrag for			Formue	Gi nærmere opplys- ninger om for- sørgelsen, bl.a. hvor stort beløp det dreier seg om

Andre opplysninger   Legg om nødvendig ved egen blankett eller eget ark - se rettledningen

Har De aksjesparing med skattefradrag? Oppgi i så fall innskudd som er gjort i 1988		Har De eiendom i utlandet? ✕ Nei Ja
Har De i 1988 solgt aksjer, andeler i aksjefond, grunnfonds- bevis i sparebanker, tildelingsbevis eller tegningsrettigheter? ✕ Nei Ja se rettledn. Hvis ja,		Har De eiendom eller næring i annen kommune? Oppgi i så fall kommunens navn. Kommune *Vestby*
Har De i 1988 mottatt lotteri-, tippe-, lotto- eller to- talisatorgevinst til en verdi av kr. 10.000 eller mer? ✕ Nei Ja		Merknader
Har De i 1988 mottatt arv eller gave ... n verdi av kr. 10.000 eller mer? ✕ Nei Ja		

Dersom tilsendt selvangiv- elsesblankett (fornhånds- navnet eksemplar) ikke er i den målform De ønsker, sett kryss i denne ruten

Bare til bruk for ligningskontoret - Ikke skriv her

Sk.pl.fl. komm.		Formuesansettelser		Inntektsansettelser					
12- deler	Kl.	Formue	Gjeld	Inntekt (før særfr.)	Av inntekten kan lignes særskilt	Tillegg inntekt stat	Fordelings- fradrag	Særfradrag §§ 76 og 77	Særfradrag § 78 Beløp Kode

Pensjonsgivende inntekter				Livsforsikringspremie og sparing med skattefradrag			Forsørgerfradrag			Ens- lig fors.	For- sinkelses- avgift	Till.skatt ikke lev. selvang.
Lønn m.v.	Jord/skog/fiske Lav sats	Næring Høy sats		Gruppelivs- forsikring	Individuell livsforsikring	Sparing med skattefradrag	Etter 1972	1970-1972 1/1 1/2				
							Evt. beløp					

Not. liste	Kode søkn.	Frit. s/a 89	Forskuddsutskrivingen 1990					Ferd. be- regn.	Forskudd/utenby(gd) ans. overføres fra f.nr.	Kode	Beløp	Særb.	1. G.	2. G.	Gj.oppt.
			Arb giv. fradrag	Ikke særfradr.	Forsk. form.	Konf. s/a	Barn 72-73					Lesek.			
									1 2 3 4 5 6 S/a			Dato/Sign.			

Navn   Komp.nr /Yrke   Rekkefølgenr. (ektefelles f.nr   Fødselsnr   Sk m.gr

Figure 3 a): The first page of a tax return form from 1988 filled in by hand. The items on the first page are not numbered. They are mostly for personal information. It is also a free text field titled "Merknader", which means "remarks" in English.

22

De mest brukte postene for lønnstakere og pensjonister er **grønne**.
Se rettledningen om hvordan De skal fylle ut de enkelte postene

1988

Inntekt   Angi beløpene i hele kroner

		Arbeidsgiver/Utbetaler	For tidsrom (fra - til)	I. Egen inntekt	II. Ektefelles inntekt	III. Inntekt for barn født i 1972 eller senere. (Post I fylles ut bare for barn født i 1976 og senere)
1	Studer rettledningen spesielt nøye ved utfylling av postene 1, 2, 3 og 4.					
	a) Lønn, honorarer og annen godtgjørelse, serveringspenger, skattepliktige sykepenger og dagpenger under arbeidsløyse og enkelte naturalytelser. Se rettledningen under post 1 (Post 1 1 på lønnsoppgaven)	NCR Norge A/S	⁷/₆ - ²⁴/₁₂	156 289		
	b) Utgiftsgodtgjørelser fra post 1 2 på lønnsoppgaven	se vedlegg 1 (og 2,3,4,5)		1223		
	c) Annen inntekt av arbeid (Gi nærmere opplysninger)					
	Sum pensjonsgivende lønnsinntekt m.v.					
2	a) Føderåd i jord- og skogbruk					
	b) Tjenestepensjon, livrenter i arbeidsforhold					
	c) Ytelser fra folketrygden (Sett X i ruten som passer)	Alders-pensjon ☐ Uføre-pensjon ☐ Barnepensjon (ikke barnetrygd) ☐ Overgangsstønad ☐ Pensjon til etterlatte o.l. ☐ Attføringspenger ☐				
	Sum lønn og pensjon	(Grunnlag for beregning av helsedel og toppskatt Om beregningen - se rettledningen)				
3	a) Fri bil hjem-arbeidssted	Bilens listepris ny Avstand Antall reisedager				
	b) Andre naturalytelser enn post 1a ovenfor	Utbetaler				
	c) Overskudd på trekk-frie utgiftsgodtgjørelser	Utbetaler				
	d) Bidrag, livrenter o.l.	Utbetaler Bidragsfogden, bidrag til barn Hva slags ytelse?				20250
	Sum post 1- 3			318 095		20250
4	Fradrag for utgifter i trekkpliktige utgiftsgodtgjørelser i post 1b ovenfor (Spesifiser på eget ark)			÷	÷	÷
5	Sum post 1 - 4 (Grunnlag for beregning av minste- og oppgjørsfradrag)			318 095		20250
	Sum kolonne I + II + III			338345		
6	Inntekt av jordbruk 7 Skogbruk 8 Fiske Sum					
9	a) Inntekt av annen næring I samsvar med særskilt regnskapsskjema					
	b) Skattepliktige sykepenger og dagpenger under arbeidsløyse i næringsvirksomhet					
10	a) Renter av bankinnskudd, obligasjoner, utbytte av utenl. aksjer o.l. (fra post 46 II)	I. (Stat)	II. (Kommune) 4.473			
	b) Utbytte fra aksjer i norske selskaper eller av andeler i aksjefond m.v. (fra post 48 II)	+				
	Sum		4.473			
	Skattefritt beløp (se rettledningen)	÷	4.200			
	Sum		273			
11	Avkastning på "sparedelen" av livsforsikring	+				
	Evt. rest skattefritt beløp (se rettledningen)	÷	273			
	Sum kolonne I. ÷ sum kolonne II. overf. til post 49 a Sum		273 ➤	273		
12	Nettoinntekt av prosentlignet boligeiendom (Ligningsverdi) 45.700 ÷ 25.000) x 2,5% =			517		
13	Nettoinntekt av prosentlignet hytte eller landsted Ligningsverdi 40.700 x 2,5% =			1017		
14	Nettoinntekt av annen fast eiendom Uten å trekke fra renter av gjeld Legg ved særskilt oppgjørsskjema for huseiere					
15	Gevinst ved salg og ekspropriasjon av tomter og annen fast eiendom Gi nærmere opplysninger					
16	Gevinst ved andre salg, ved overføring av bruksrett o.l.					
17	Renter av utestående fordringer, pantobligasjoner og andre gjeldsbrev Se rettledningen til post 52					
18	Renter av utenlandske ihendehaverobligasjoner og utenlandske bankinnskudd Om spesifikasjon, se rettledningen til post 53					
19	Andre inntekter Gi nærmere opplysninger					
20	**Sum bruttoinntekt** (post 5 - 19) **Overføres til post 34**			340.152		

Figure 3 b): The second page of a tax return form from 1988 filled in by hand. Different categories of incomes are visible. The structure and numbering of the items can be seen, in addition to items that are not used. Calculations are shown, for example Items 12 and 13 indicate how net income of property will be calculated.

Figure 4 shows the upper half of the first page a pre-completed tax return form from 2002. The pre-completed figures is corrected by hand. The item numbers still give clues to the internal relations between the various items, but the structure gives less information. Items that are not in use are not visible, so a citizen does not immediately see that there are other options available. The pre-completed paper form was introduced early in the 1990-ies and was an intermediate step towards the online tax return form that was introduced later.

Figure 4: The upper half of the first page of a pre-completed tax return form from 2002. The numbering of the items is clearly visible. This form does not have a fixed layout; hence it will look differently from year to year if the number of items varies. Items that are not used is not visible.

Figure 5 shows the online version of the tax return form from 2010. It is quite similar to the pre-completed paper form in Figure 4. The internal structure between the sheet items is even weaker, but items that are not in use are visible to the citizen in a drop-down menu.

< Gå tilbake

RF-1030 Selvangivelse for lønnstakere og pensjonister mv. 2014

Selvangivelse for lønnstakere og pensjonister mv. | Vedlegg

Gå direkte til post: -oppgi nummer- | Utfør | Søk i rettledningen: [   ] | Søk |

Klikk på
ha mer

Post		Inntekt/Fradrag		Formue/Gjeld		Handlinger
		Opprinnelig verdi	Rettet til	Opprinnelig verdi	Rettet til	
1.3/1.5 Opplysninger om personlige forhold mv.	❓					Endre
1.6/1.7 Personinntekt fra foretak	❓					Endre
2.1 Lønn og tilsvarende ytelser	❓	XXX				Endre
2.2 Pensjoner, livrenter i arbeidsforhold	❓					Endre
2.6 Bidrag, livrenter, barnepensjon mv.	❓					Endre
2.7 Næringsinntekter	❓					Endre
2.8/4.3 Bolig og annen fast eiendom	❓	XXX	XXX	XXX	XXX	Endre
3.1/4.1/4.5 Renter, innskudd, verdipapirer, andre kapitalinntekter mv.	❓	XXX		XXX	XXX	Endre
3.2 Fradrag i tilknytning til arbeidsinntekt mv.	❓	XXX				Endre
3.3/4.8 Renter, gjeld, andre kapitalkostnader og fradrag	❓	XXX		XXX		Endre
3.5 Særfradrag	❓					Endre
4.2 Innbo/løsøre, bil, MC, båt mv.	❓			XXX		Endre
5.0 Tilleggsopplysninger	❓					Endre

| Se på før innsending | | Kontroller skjema | Start innsending | Alle skjema må vær
gå videre. |

Figure 5: The electronic version of the tax return form. Screenshot from the author's tax return form on Altinn.no for 2014. Original figures are censored.

The Norwegian tax system is based on advance tax payments that employers deduct from the employees' salaries. At the end of the taxation year, the tax return forms are produced by the tax authorities and corrected or confirmed by the citizens. On this basis, tax is calculated and settled against the advance tax payments[7]. The advance tax deductions are regulated by means of a tax card, which may be either based on a table (for monthly salary payments), or a percentage (for irregular salary payments). Citizens with little income, for example students and pensioners, do not pay advance tax, and can use an exemption card.

Citizens only need to explicitly do their taxes if they experience changes in their personal economy or life situation, or if they discover an error. This means that many citizens have little practice in doing tax, and lack the experience this can provide for handling certain other issues that may arise. Digital communication has become primary for public agencies communicating with citizens[8]. The citizens are encouraged or coerced to use online services as a means of applying for services or reporting personal information; for example to check, correct and submit the tax return form described above, or order a tax card[9]. Many public offices no longer have a service counter where a citizen can meet and talk with a civil servant in person, or this service has been centralised.

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[7] This description is simplified but applies roughly to how the taxes are calculated for most employees and pensioners.

[8] Changes to the Public Administration Act ("Forvaltningsloven") § 15 a.

[9] From 2014 the tax card has become electronic. At the time of the field work for this thesis, the tax card was distributed to citizens in paper form.
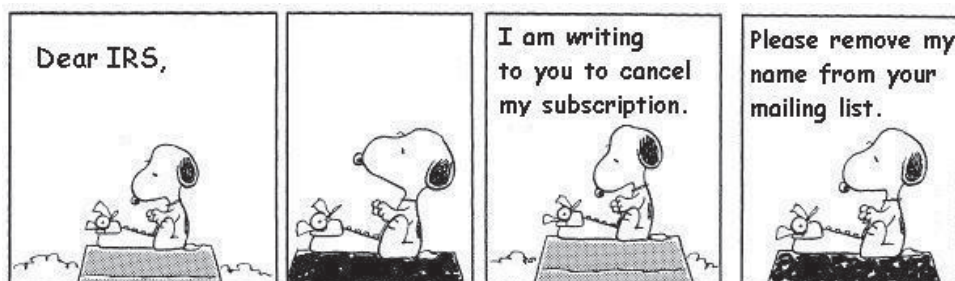
Figure 6: Snoopy illustrates the absurdity of opting out of the tax obligations. ©Peanuts Worldwide, LLC.

All citizens are required to provide the tax authorities with the information needed to calculate how much tax they should pay according to the tax rules. Citizens cannot opt out of paying taxes as Figure 6 below indicates. The tax authorities have a relationship with the whole Norwegian population and foreign workers in Norway.

In 2012, the Tax Administration distributed 4.4 million pre-completed tax return forms[10]. Around 2.6 million taxpayers used their "silent consent" option. 900 000 citizens submitted their tax return form online, and 78% of these, that is 702 000 citizens, made changes to the pre-completed form. There are no statistics for how many who silently consented to their pre-completed tax return form without checking the figures, nor how many citizens checked the paper version of their tax return form and on this basis accepted the pre-completed version.

The Norwegian Tax Administration runs a large web site, www.skatteetaten.no, which contains information about tax rules and regulations as well as some transaction-based services for ordering or changing a tax card, entering figures for the tax return form and registering a new address to the Population Register when moving house. There are some services that are not available online, in particular requesting a copy of an exemption card, or a printout of the tax return form. Other services include the possibility to order an exemption card or a tax card by sms[11]. The tax authorities are active on Facebook, however, this is fairly recent and started after my fieldwork had finished.

Citizens who have questions about their taxes may contact the tax authorities through many channels: meeting in person at a physical counter, calling the Tax Information Call Centre, reading books or leaflets, looking at the website, or via Facebook. The Tax Administration does not provide a "My Page", where a citizen can log in and look up what is registered about her and change the information if necessary. The citizen who wants to change information online will need to log in to separate services for each type of request.

SOL, the call centre, receives phone calls about tax questions from all over Norway and abroad. When calling, the citizen is asked to choose a tax-related topic from a spoken menu. These will typically be "Tax card and tax return form for employees and pensioners", "Tax for businesses", "The population register", "Inheritance and gifts", and "Other", although the menu items may vary slightly from time to time. The tax advisors answered 1 987 764 phone calls in 2011, where 1 487 922 calls were about personal tax (out of a population of

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[10] Aftenposten, April 28th, 2012, building on statistics from Statistics Norway (http://www.ssb.no/skatt_statres/).

[11] The webpage and the electronic services are in continuous development. The descriptions apply to the time of the fieldwork, unless explicitly mentioned.

approximately 5 million Norwegians and some foreign workers[12]). It is important to keep in mind that these figures are the numbers of telephone calls, not citizens. Because some citizens call more than once a year, these figures do not show how many individual citizens call SOL.

3.2 Initial research approach

The initial version of this study was formulated as a reply to a request from the Tax Administration to design new services for improving communication between citizens and the tax authorities. The tax authorities acknowledge that when the technology for doing taxes changes, the relationships between citizens and the tax authorities change as well. The Directorate of Taxes and the Department of Informatics have signed a cooperation agreement for conducting research into better design for doing taxes. From the outset my research interest centred on the relationships between the various layers of technology of the tax authorities, the work of the case handlers working for the tax authorities, and the citizens doing their taxes.

The IT director of the Norwegian Tax Administration was interested in trying out social media such as FAQs, chat, or discussion fora for supporting new forms of communication between citizens and the tax authorities. This directed my interest towards learning what kinds of problems were experienced by citizens. I wanted to get in contact with those who have problems doing their taxes.

Many of those who struggle with doing their taxes are non-users of the online services of the Tax Administration, or they have tried using them but have not succeeded. In an initial meeting with the IT director of the Tax Administration and the director of SOL I was offered the opportunity to co-listen to telephone calls to SOL. I accepted wholeheartedly and thought that co-listening would make a nice preparatory phase in the research project. I found SOL and this world of telephone calls from citizens so fascinating that I ended up using this as the main field site for my study.

3.3 Case overview

I have studied citizens' experiences of doing their taxes when many of the procedures for gathering and providing documentation, in addition to calculating and paying taxes are automated. The unit of study is the telephone call from a citizen to SOL. SOL is an organisational unit within the Tax Administration. The advisors answer the phone calls from the citizens, and to answer the citizens' requests they may use various databases and/or contact second line support or case handlers in other units of the agency. The triangle of relations from Figure 1 is studied via the calls to SOL, the advisors' use of technology, and their relations to other employees and departments in the Tax Administration, see Figure 7.

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[12] Also foreign workers call SOL and are included in the figures for calls to SOL.
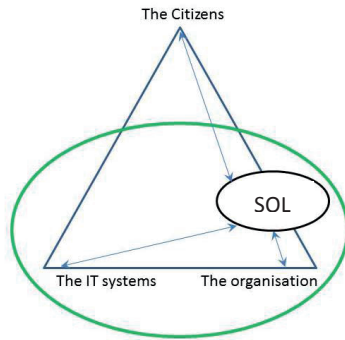
Figure 7: The relations between the citizens, the IT systems and the organisation are studied via the calls to SOL.

The larger aim in this study is to shed light on the relation between humans and automation. Doing taxes is studied as an example, also giving me a basis for suggesting implications for design for citizen autonomy. The case study is instrumental, as the case itself "is of secondary interest, it plays a supportive role" to a more general research question (Stake 2005). The case will be described in more detail in Chapter 4.

3.4 Research techniques

Co-listening to the telephone calls from citizens to SOL has been the main technique of data gathering. However, co-listening has been supported with other techniques such as interviews, observations, text analysis etc. In this section I will describe the techniques used for data gathering.

Co-listening

I *co-listened* to 474 telephone calls during the time period from April 2010 up to and including February 2012. I spent approximately 75 hours co-listening, which took place in sessions of varying durations and at different times of the year. Different tax-related activities dominate at different times of the year, and I have covered some of these by co-listening before the deadline for submitting the tax return form in April, in the fall when many tax assessments are made available, and at the end of the year and the beginning of a new year when the tax cards are produced and distributed. I have mainly listened to telephone calls on the helplines for "tax return form and tax card", with some co-listening on the helplines for "population register" and "business" to give me greater breadth and understanding of the advisors' work practices and use of databases in SOL.

Co-listening is a routine activity in SOL. The advisors co-listen to each other for training and quality assurance. When co-listening, I sat together with the advisor at his or her desk in the office landscape, see Figure 8 below. Most advisors used a wireless headset for telephone conversations, and I used one of a similar type. I could hear the full conversation between the advisor and the caller, and I could see what the advisor did: which computer programs the advisor opened and used, what he or she entered in the databases, and how they used paper-based materials during the phone calls. Sometimes the advisor picked up and used a small hand-held calculator during the calls. I was very concerned about not using the microphone on my headset, so it was set to point upwards to avoid accidental use. If the time between calls allowed it, the advisor sometimes made comments about a call, or I asked questions. I

particularly learned from the advisor's comments which tax services they expected the caller to use online.

Figure 8: An advisor's desk in the open office landscape of SOL. The desk is equipped with a computer screen, a keyboard and a mouse, a telephone, and various papers and personal items.

During the phone calls, I made notes on paper, both for the privacy of the callers and for practical reasons. This provided me with less verbatim quotes than a tape record would have done, but I was able to write down some verbatim quotes that I found interesting and significant. The hand-written notes were later typed and filled in with information added from memory. All conversations that are quoted in the following are shortened and simplified both out of necessity and for clarity. Many calls contained repetitive parts where the advisor for instance asked the caller about the name, national identity number and other recurrent questions. I never made notes that could identify a person, and tried to focus my note-taking on the primary content of each call.

I was appointed a contact person at SOL, and she scheduled the co-listening sessions after making an appointment with me, and chose the advisors I co-listened with. I had requested to co-listen with various advisors, both experienced and inexperienced, and on different helplines, and she assigned me co-listening sessions accordingly. She paid attention to the schedules of the advisors and the expected loads on the helplines when setting up my sessions. After the first few sessions I realized that the topics and issues varied considerably on the different helplines, so I decided to concentrate on the helplines for personal tax: tax card and tax return form, both the Norwegian and English-speaking lines. With some advisors I co-listened several times, and only once with some others.

The Norwegian language was used in most conversations. When some callers spoke English, the advisor also spoke English. I took notes in Norwegian. Quotes used later in the text from calls in Norwegian or languages other than English, have been translated into English by me. For tax-related words, I have tried to use English translations authorised by SOL whenever such could be found. SOL provided me with translations of some frequently occurring words from the telephone calls. For other tax-related words, I looked up a web page on skatteetaten.no where that particular word could be found, and searched for an English version of the same page. Not all web pages have parallel pages in the English language, so this was not always a straightforward search process. I typically had to look at the translation of a topic, rather than a word. Translations of some tax-related words could also be found in the online dictionary ordnett.no from Kunnskapsforlaget, which I used for general translations of notions concerning society and economy. At times, the callers used incorrect terminology, and I have aimed at preserving such errors in my translation.

Co-listening is in my view an ethnographic technique (Crang and Cook 2007; Myers Living version). It involves listening to the callers and the advisors as they talk together on the

phone. The conversation unfolds without directions from the researcher. The twists and turns of the conversation are not a result of an interview guide, or tests or experiments designed by the researcher and executed in a laboratory setup. Both the caller and the advisor are located in a naturally occurring setting for this activity. The caller explains her tax-related issue and her personal situation if needed, and answers the advisor's questions uninfluenced by the co-listener. The advisor is aware of the co-listener as she sits beside him or her at the desk. The advisor is professional, and answers hundreds of telephone calls a month. Most advisors have prior experience from both co-listening and being co-listened to, which will make him or her less prone to deviations from ordinary business-as-usual during the telephone calls when accompanied by a co-listener.

Observations
While at SOL for co-listening and interviews, I also made observations concerning the surroundings and the work taking place there. While co-listening in the open office landscape of SOL I could also see and sometimes hear what other advisors and managers were doing. I have listened to and taken part in informal conversations with the advisors and managers during breaks.

Interviews
I have made 15 semi-structured *interviews* with tax advisors and others, see Table 1. In addition to interviews with employees of the Tax Administration, I also interviewed one employee of a tax-related NGO to obtain an external perspective on how citizens cope with doing taxes. The interviews took place from October 2010 to June 2012.

Tax advisors	6
SOL Managers	2
Employees in other units of the Tax Administration, working with their web, IT, or usability	6
Employees in an NGO	1
Sum interviews:	15

Table 1: Number of interviews with various groups inside and outside of the Tax Administration.

Most interviews lasted about 1.5 hours; some of them lasted about 2 hours. The interviews with SOL employees were mostly conducted in small meeting rooms outside of the main SOL premises. Other interviews were mostly conducted in the interviewee's office. All interviews were tape recorded and transcribed for the analysis. I collected diagrams or figures occasionally made by an informant; some also showed me how they used some of the computer programs we were talking about in the interview.

The interviews took place as relatively free conversations around the topics in my interview guide with open-ended questions that could be followed relatively freely, although following the interview guide ensured that certain main topics were covered. The interview guide was first designed for interviews with SOL call advisors, but was adapted as I interviewed people in other positions in the Tax Administration and outside. For the interviews with the advisors, the main topics were: an introductory round about the interviewee's current position and background, their relation to the public, their use of IT in

their work, work organisation, and how they think about the citizen's autonomy in doing their taxes. I was particularly interested in what they considered difficult questions from the callers.

All interviews were conducted in, and transcribed into, Norwegian. Where quotes from the interviews appear in English in the text below, the translation of this passage has been done by me in line with the description above. The same goes for other texts in the Norwegian language that are quoted in the following.

Document studies

Annual reports and steering documents have provided me with statistics and factual information about SOL, their objectives and strategies, and their relations to the rest of the Tax Administration. I have read some analytical reports produced by the Tax Administration. Document studies also included reading the Norwegian Tax Law.

Website studies

During the research I have been an enthusiastic user of the website skatteetaten.no. A major redesign and launch of new web pages took place during the research. I copied and saved some of the most relevant pages for possible future reference before the shift came into effect. From the calls, I learned which online services were available at the website, as the advisor often instructed the caller to use these. I have also supervised two master students working with evaluation and design of the Tax Administration web pages.

Seminars

At an early stage in my research, in August 2010, I presented my project at a seminar in the Tax Administration about channel strategies. After lunch, I took part in the group discussions that followed for the rest of the day. This gave me a detailed picture of how employees in various positions and departments in the Tax Administration described the challenges of communicating with citizens about tax issues.

A few months before this thesis was completed, I was asked to give a presentation of my research for the Department for Innovation and Development (in Norwegian "Avdeling for innovasjon og utvikling") at the Tax Administration. I presented a preliminary version of the analysis with some examples of phone calls before we had a short discussion. Valuable comments from this session are taken into account in the analysis.

Tax related activities

As a researcher on doing taxes I have attracted both questions and personal experiences from private persons about doing their taxes. On some occasions colleagues have asked me to help them with some tax issues. This has led me to try to find answers on the web page, call SOL or fill in a form. In some of these situations I have written down field notes afterwards. During the research, my private tax-related activity has been part of the data collection. Merely mentioning that I study citizens doing taxes often triggers personal narratives by friends and acquaintances. Personal experience from filling in the tax return form, talking to people about taxes, helping my family when changing or ordering a tax card, all have resulted in some kind of "headnotes" adding to the field work.

Head notes

As a background to observe and interpret what is going on inside a government agency, I draw upon 10 years of experience from working within the government sector. I worked in a public agency from year 2000 to 2009. During that time I collaborated with employees from the Tax Administration on several occasions in various projects before I started my research. Hence, I had acquired some knowledge about the organization, the tasks and the IT architecture of the Tax Administration. I use the notion of "head notes" to describe experiences, impressions, encounters and evaluations that are continuously present in my memory (Ottenberg 1990, in Finken 2005).

3.5 Ethical considerations

Co-listening routinely takes place at SOL. All co-listeners, including the researcher, must sign the standard non-disclosure agreement of the Tax Administration which is developed in accordance with the Norwegian Data Protection Authority. Co-listening is done as part of the training of new advisors, and for colleague feedback and quality assurance. Employees at other units of the Tax Administration also come and do co-listening once in a while, as this gives valuable impressions of issues the citizens experience when doing taxes.

SOL does not tape record the calls. The advisors registered each call in their log system (Verne 2015, Paper 7), and I made notes on paper. Because SOL does not routinely tape record their phone conversations, I did not want to interfere (more than I already did) by asking them to do that. In addition, making notes on paper made the callers less identifiable and protected their privacy in accordance with the guidelines for privacy and research ethics from the Norwegian Social Science Data Services. I never noted name, address, national identity number or other information that could identify a caller. This study has been approved by the Norwegian Social Science Data Services. All personal names of SOL employees and callers in the examples that follow, as well as all geographical names, are pseudonyms.

An important aim of this study is to give a voice to lay people who experience difficulty doing their taxes. In this study, I want to take these problems seriously and give those who struggle doing their taxes a voice.

3.6 Master students and teaching

Some students' work have provided secondary data sources for my research. During my PhD-period I have supervised alone or together with another supervisor three master students within the topic of citizens doing taxes. Åshild Aaen Torpe wrote a master thesis where she did participatory design to make a prototype for a mobile service from the Tax Administration[13]. Together with my colleague Alma Leora Culén I supervised Nora Raaum who wrote a thesis on interaction design. With eye-tracking technology she studied how a

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[13] "Skatteetaten på mobil: Fornying ved hjelp av deltakande design", in English: "The Tax agency on a mobile: Renewal by participatory design". Master thesis UiO, Department of Informatics, 2012 by Åshild Aaen Torpe

group of users read and navigated the web pages of the Tax Administration[14]. By courtesy of the Usability Group at the Directorate of Taxes, we were given the opportunity to use their eye-tracking equipment.

My third master student, Ida Braaten, has submitted her thesis in February 2015. She has done participatory design of technology support for doing taxes for young people with little previous experience of or interest in doing taxes. She has done design workshops together with four classes at two secondary schools. First she taught them a little bit about tax rules and regulations, and then did various workshops where she at the end asked them to sketch a design suggestion[15]. I took part in most of these workshops in a supportive role. Verne and Braaten (2014, Paper 6) reports from these workshops. I will come back to this project in the discussion.

Design for support for doing taxes has been one of the given topics for student projects in the course INF 5722 "Experimental Design of IT" for three years. Different approaches and designs have come out of this, and made an inspiration for my own analysis and reflections about design for doing taxes.

3.7 Analysis

The unit of analysis in this thesis is the call. The analysis is done on two levels. First, the conversations are analysed to extract the issue of the call. I have created categories to group calls of similar issues. Second, the issues are analysed to identify manual tasks that are seen as residue after the automation.

The first-level analysis is about the caller's problem as it can be inferred from the conversation between the caller and the advisor and informed by the activities that the advisor did during (or sometimes after) the call. The advisor's comments after the call and my own understanding of the issues involved also informed the analysis. Data from the interviews gave a background to understand the work practices of the advisors. Technical agency that may influence the course of the conversation may be visible during the call, for instance the contents of various databases may lead the advisor to ask the caller particular questions. From this, I could understand the advisor's approach to the issue. Technical matters influenced the course of the call without being visible, and this had to be inferred from what the caller said, for example, when the caller reported to have tried to use the online services without succeeding.

Even though the analytical unit is the call, I do not go into detail about analysing what is actually said, such as Harvey Sachs analysed the phone calls to the suicide emergency centre (Sacks 1992). The conversation as such is not analysed in very much detail, as my concern is with extracting the underlying issue or request from the caller's description and analysing how the advisor interprets and responds to it.

The second-level analysis focus on identifying the manual tax work that the citizen still needs to do according to the "ironies of automation" (Bainbridge 1983). In this analysis, I have looked for residual tasks after the automation, and indications of these causing complications for the callers.

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[14] "Hvor ser brukeren? En analyse av eye tracking-data fra bruk av Skatteetatens nettsider", in English: "Where does the user look? An analysis of eye-tracking data from use of the Tax agency's web pages". Master thesis UiO, Department of Informatics, 2013, by Nora Raaum

[15] "Doing Participatory Design in a School Setting." Master thesis, UiO, Department of Informatics, submitted February 2015, by Ida Braaten

3.8 Paradigm and methodology

This research is an instrumental case study within a critical research paradigm (Stake 2005; Myers Living version). Critical research is based on the presupposition that social reality is historically constituted. It is characterized by a critical stance towards assumptions taken for granted about organisations and information systems, with an aim to expose "deep-seated, structural contradictions within social systems" (Orlikowski and Baroudi 1991; Myers and Klein 2011). The abilities of people to change their social and economic circumstances are constrained by "various forms of social, cultural and political domination" (Myers Living version). I would also add structural and technological domination to this list. Critical research aims at changing alienating and restrictive constraints for people to achieve improvements in society and individual emancipation (Myers and Klein 2011).

This case study is inspired by ethnographic thinking (Blomberg and Karasti 2013). In addition to the physical field site of SOL, co-listening gives a kind of access to remote field sites where the caller is located. The citizens call SOL from their work place, their car or from their home. A few callers were physically located at a hospital or on a fishing vessel. The conversations tell about the citizens' private life situations and give an insight into phenomena that are difficult to understand from the outside. In this respect, co-listening is an indirect technique to gain access to remote field sites and private use or non-use of technology.

3.8.1 Limitations

Co-listening gives only access to those citizens that call, and only into a tiny part of their private life situations and concerns. It does not give access to those citizens who do not call, either because they do not experience problems, solve the problems themselves, contact some other (private) advisor or do nothing with their problems. I did not make contact with the callers after the phone calls, so I have no information about how they understood the advice (except from what was said during the call) and how they followed it up afterwards. Neither does co-listening give access to the callers at a time when they do not call. The issues of those who do not call are not a part of this study. My results can neither be used to evaluate for instance the population's understanding of taxes, the responses from the advisors nor the online services of the Tax Administration. However, the 474 calls I have listened to give information about some of the issues the citizens cannot resolve by themselves.

3.9 A note on terminology and boundaries

By "doing taxes" I include all those activities needed to provide information to the tax authorities as well as calculating and paying taxes. "Doing taxes" also involves the activities related to updating and distributing the tax card. I use the term "doing taxes" in a wide sense, and make a point out of the messy delineations of this term. For example can sending a "notification of address" after moving house count as doing taxes – as the lack of such notification may lead to complications in the relationship between the citizen and the tax authorities, which will be shown in the following analysis.

I use the term "citizen" as the generic term for all those who have to do their taxes, by automation or manually. Connotations of civic responsibility apply to the notion "citizen", but not so much to the frequently used words "client" or "customer". I find it important to

emphasize the seriousness about doing taxes, both for personal economy and accountability, and for the societal aspects of being a responsible citizen. During the actual phone call I use the notion "caller". A caller is always a citizen who makes a phone call to SOL, but every citizen is not necessarily a caller.

A citizen may or may not be a user of the online services for doing taxes, the same goes for a caller. Sometimes a caller states explicitly during the call that she has tried and failed; however, many callers say nothing about their online tax experiences and I do not interpret this in any direction. The automation of doing taxes applies to all Norwegian citizens and foreign workers in Norway. However, I never use the notion "user" of someone who is covered by the automation of taxes unless they explicitly use some online service for interacting with the tax authorities. I find it difficult to apply the notion of "user" to people who are served by an automated service that they know very little about.

Those who explicitly tell the advisor that they have not tried to use a particular online service in a particular situation before they make the phone call to SOL I may call a non-user. Also those callers who say that they have tried but not succeeded will be understood as non-users of that service. Co-listening is probably one of very few techniques where the researcher gets to hear non-users' view on the digital service.

4. The sociomaterial assemblage of doing taxes

This is the first of three analytical chapters. I start with a description of the conversation partners and the environment of the citizen's call to SOL. In the next chapter I go deeper into an analysis of why the citizens call SOL. In the third analytical chapter I analyse how automation changes the tasks for the citizens.

4.1 SOL - The advisor's workplace

SOL is the call centre and first-level service for all calls from the citizens to the tax authorities. SOL is part of the Tax Administration, however, it is organized in parallel with the main regional structure that handles cases, see Figure 9. In the governance letter for the year 2011 from the Directorate of Taxes to the rest of the organisation, the role of SOL is described like this: "The agency will move from solving the problem for the tax payer to providing a basis for self-help via Skatteetaten.no. The employees at the Tax Information Call Centre will to a larger degree navigate and give advice in the use of online self-services".
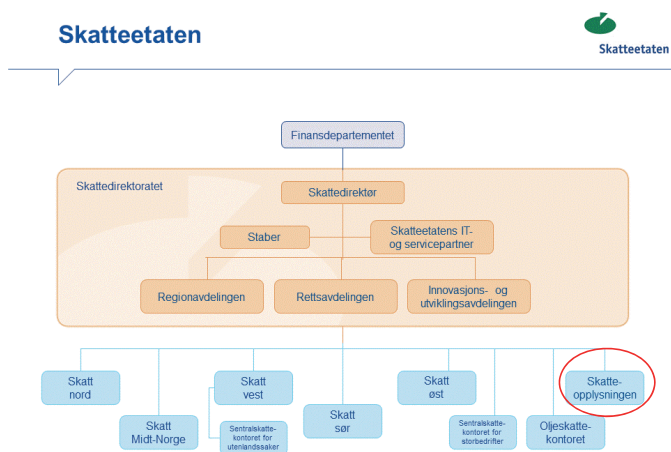

Figure 9: The organisational structure of the Tax Administration as of May 2014. The Ministry of Finance is at the top, governing the Directorate of Taxes that governs all the other units of the Tax Administration. SOL is the circle in the lower right, in Norwegian "Skatteopplysningen". The blue labels "Skatt Nord", "Skatt Vest" etc. are the five regional units that handle "ordinary" tax cases, roughly translated as "Tax North", "Tax West" etc. In addition there are some special units for oil taxation, taxation abroad and large companies. Source: skatteetaten.no

One of the managers of SOL described SOL as a buffer between the citizens and the rest of the tax authorities. He illustrated this point by changing my figure of the triangle of relations (Figure 1 in Section 1.1). In his version of the triangle of relations, SOL is located closer to the citizens. He illustrated by drawing new organisational borders of the tax authorities. Figure 10 shows his edited version.
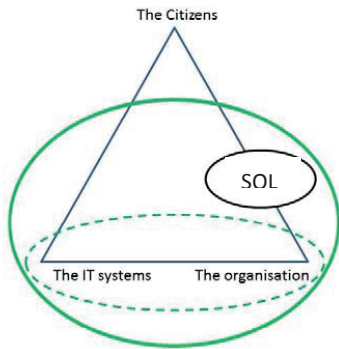
Figure 10. The edited triangle of relations from Figure 1. The solid line indicates the organisational borders of the Tax Administration. The dotted line was provided by my informant, and indicates SOL as sitting outside the Tax Administration.

SOL has several national offices, and my fieldwork took place at one of these. Here, the advisors sit in an open landscape, each with a desk equipped with a PC and an IP-telephone, see Figures 11 a and b, and Figure 8 on page 29. The office areas are light and open. Some advisors have stacks of papers on their desk, some a few posters on the walls. Some have a few books about tax rules and regulations like Lignings-ABC ("Taxation-ABC") and "Jarøy skattelovsamling" ("Jarøy Tax Law Collection").


Figure 11 a): The open office landscape at SOL

Figure 11 b): A pile of tax rules and guidelines on paper.

SOL advisors answer the phone for all calls to the Norwegian telephone number 800 80 000. A spoken menu greets the caller, telling her to press a key for the different lines. In periods of long waiting lines, the callers can register their phone number so that SOL can call back when they have moved to the front of the virtual waiting line. Many citizens do this and some openly acknowledge it when they finally get in contact with an advisor. In my fieldwork, I have seen waiting times up to 45 minutes during peak periods. The waiting lines are monitored by a large screen near the management desks in the open landscape, see Figure 12 a and b. The screen says that on this date and time the average waiting time for the line for

Tax cards is 2:46 minutes, while the longest is 5:48 minutes. There are similar figures for the other lines.
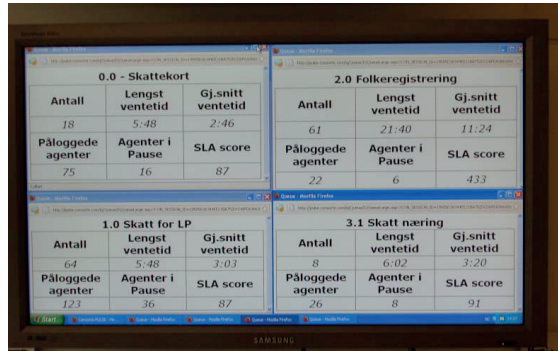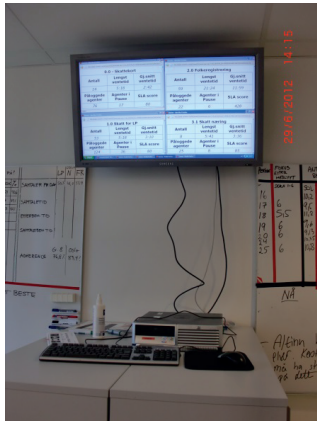
12 a): The waiting times for the different lines answered by SOL are monitored on a large screen in SOL (left). b): Close up of the screen in a) – we can see that the population register has the highest waiting time with 21:40 minutes (right).

The waiting times on the different helplines are monitored, together with the advisors' adherence to their assigned telephone schedule. The duration of the call is measured and reported back to the advisor, but not monitored. SOL management and advisors all explain that it is better to spend the time necessary to help the citizen thoroughly instead of doing an inadequate job resulting in the citizen calling back several times with follow-up questions. In particular, teaching a caller how to use the online self-services will be time well spent. Perhaps they will try the self-service functions without calling the next time, or help a friend or relative. This is expected to reduce future load on SOL telephone service.

At the time of the fieldwork, the monitoring of the advisors' adherence to their schedule was controversial. The adherence measured the time in minutes the advisors were available on the phone as a percentage of the time between the start of telephone duty and the end, and was displayed on a whiteboard for the group, see Figure 13 below. Individual adherence measurement was a topic for individual discussion between advisors and their managers. Most advisors I discussed it with, said that it was unnecessary strict. If they did not answer a call when there were 3 minutes left before their lunchbreak, their adherence would decrease. However, if they answered the phone, and the call lasted for 6 minutes, a little more than the average call, their adherence would also be reduced, because they had stayed too long on duty.

However, management said that adherence was monitored mainly to reinforce the importance of being on duty during the scheduled times, and if an advisor had to continue a telephone conversation beyond the scheduled endpoint, they could send an e-mail to the manager and explain the situation. The manager could then manually adjust the figures in the advisor's favour.

Figure 13: A whiteboard showing measurements of adherence and logging for weeks 48 to 3. Adherence is the percentage of adherence to the scheduled telephone duty, and logging is the percentage of calls that the advisor registers in the log. The last column shows the percentage of calls that are logged to second-level support.

Jan Tore, one of the advisors, claimed that the details of how adherence was measured and monitored were counterproductive to giving good service to the callers. He gave an example where a citizen calls from a mobile phone, and they are perhaps in the middle of a lengthy conversation when the connection is lost. Jan Tore has the calling telephone number in the log, and can merely call back and continue from where the connection was lost with the context present in the databases and in the minds of both caller and advisor. However, calling manually back will not count in the adherence measurements, and the advisor will be tempted to not call back. Instead the caller will have to call the number of the agency, perhaps wait in line for some time and start the conversation from the beginning with a new advisor chosen by the system. Jan Tore argued that calling back immediately will give the best service to the caller, but the current measuring system discourages this.

Figure 13 also shows that the percentage of calls registered in the log is registered. This measurement is mainly to remind the advisors to register *all* calls in the log, even the very short and simple ones, the disconnected ones and the ones where there is no one at the other end for system call-backs. Some advisors expressed that it was not so important to log everything, but this measurement was not as controversial as the adherence monitoring.

The last measurement shown in Figure 13 is the percentage of all calls that are logged to second-level support. This is a quality measurement aimed at ensuring that the advisors' recognize the limits of their knowledge, and transfer the call to second-level support when they cannot answer sufficiently precisely and correctly. At intervals, the Directorate of Taxes alerts SOL that they will undertake anonymous "test" calls to monitor whether the advisor answers correctly according to the laws and regulations. Incorrect replies have been detected this way, and SOL is constantly working with quality assurance and improving the replies from advisors. As a consequence, advisors are encouraged to transfer more calls to second-level support as part of the quality work in SOL.

4.2 IT in the Tax Administration

As a background to understanding the work environment of the advisor and the architecture behind the automated tax system, I will give a very brief description of the IT systems and architecture of the Tax Administration. The description is based on previous experience and personal knowledge with the Tax Administration, supplemented with material from interviews and fieldwork.

Calculation of taxes was one of the first applications of computers in the 1950s (Wroldsen 2008). The basis for today's pre-completed tax return form was laid in the 1980s, when the Directorate of Taxes started preparatory work to change the legislation to allow citizens' bank and salary data to be gathered automatically. To make this possible, new laws were needed obliging employers, banks and others to report data to the Directorate of Taxes. The first pre-completed tax return form was distributed in 1990 to citizens who had a relatively straightforward financial situation. The Directorate of Taxes adopted Java-programming and web pages relatively early; in 1997, the Directorate of Taxes launched the first taxation calculator on the net, developed by the Norwegian Computing Centre.

Today, the Directorate of Taxes runs three generations of computer system technologies:
- Mainframe systems where the old technologies COBOL (programming language), CICS[16] (communication) and DB2 (database) are used.
- Oracle-based systems, the oldest of these is from the early nineties
- Newer Java-based programs and systems. These require a completely new set of competencies to develop and run.

There are many systems where the old technologies Cobol, CICS and DB2 are still in use in the Directorate of Taxes, for example in the Population Register, one of the oldest systems. It is from the 1980s and is still running on mainframe computers. SOL access the Population Register and a few other old systems via CICS, which is middleware for a transaction server that supports rapid, high-volume online transaction processing between the various units of the Tax Administration. Both for internal use for case handling and for external use by the citizens, a web layer has been built on top of many of these systems. There are some tasks that can only be done via CICS; however, new programming is underway to implement new tasks only through the use of web.

The system architecture is silo-oriented where each silo is a complex and self-contained system with very little re-use of components between the silos. There is little or no separation of enterprise logic and presentation logic. Transactions and data exchange between systems are implemented as batch processes that run during the night. Many of the large IT-systems are designed to correspond to tax-related areas, and some of these have web interfaces towards the citizens: the tax assessment where the taxation lists are published on the web, and the advance tax system has an application for changing or ordering a tax card or an exemption card. The tax assessment and the tax return form is produced by the Directorate of Taxes and presented to the citizens through the external portal Altinn. The new System for Taxation (SL, "System for ligning") is only designed for internal use by case handlers.

Altinn is a portal for the exchange of data between the public and governmental agencies. Originally, it was intended as a portal for the exchange of reports and statistics between

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[16] http://en.wikipedia.org/wiki/CICS, viewed May 6, 2014

businesses and three governmental agencies: Statistics Norway, The Directorate of Taxes, and the Brønnøysund Register Centre. Altinn is considered to be a success and close to 40 other governmental agencies currently use this infrastructure. It was a political decision to expand the use of Altinn from a service for businesses into private areas such as presenting and submitting the Tax return form.

Tax rules and regulations undergo constant development by the government, and each year the Directorate of Taxes has to change some of its programs. This has become increasingly expensive and complex due to the old architecture. The Tax Administration has defined a new common architecture for its systems based on "internet technology". Systems are gradually being transferred to this new architecture through new development projects, combining renewal of core business activities with renewal of technology. The main objective is to address the challenges facing tax collection and at the same time make a transition to a more modular architecture, which will provide a better basis for re-use of data and for developing new systems and services.

As with all technology, errors can happen. Errors have occurred related to excessive load on Altinn at the deadline for submitting the tax return form[17]. Sometimes the technology may be inaccessible due to maintenance. The Altinn message board for operations messages dated February 2nd, 2014, contains a description of a login error that affected some users[18]. The error is reported as solved. Other errors may occur in the tax calculations. In 2011 a technical error in new tax calculations led to 176 000 citizens receiving erroneous information about their tax assessments. The Tax Administration discovered the error and corrected it, and sent a letter to affected citizens; most of them pensioners and citizens with low incomes[19]. The possibility of errors occurring in the tax authorities' systems is part of the background knowledge of the advisor.

4.3 The call advisor

Call advisors in SOL work as first-level support for all telephone queries from citizens to the tax authorities. Their task is to answer general questions about tax, assisted by information in many of the computer systems used by the tax authorities. The advisors come from a wide range of backgrounds; Jan Tore has a bachelor degree and had started 18 months ago when I interviewed him, while Berit has completed the internal tax course of study and had worked most of her professional life in other positions for the tax authorities. Figure 14 shows an advisor at her desk in the open office landscape. Nils describes their work as "we sit between the Tax Administration and the citizen and read the pulse of both". Each call is logged, for their record keeping and for statistics (Verne 2015, Paper 7).

The call advisors use many IT systems in their work. Most of these are agency databases for looking up information about the callers and their taxation status, their properties or stocks, while others are for administering their own answering work. For looking up tax rules and regulations they use mostly paper documents, such as LigningsABC and circular letters, and a few online resources. If they do not know the answer to a question they can refer the question to second-level support through the log system.

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[17] http://www.vg.no/nyheter/innenriks/altinn-skandalen-stor-sannsynlighet-for-enda-flere-feil/a/10079705/ (in Norwegian)

[18] https://www.altinn.no/no/Toppmeny/Driftsmeldinger/ (in Norwegian)

[19] Aftenposten, April 2nd, 2011, see http://www.aftenposten.no/okonomi/innland/176000-har-fatt-beregnet-feil-skatt-5117362.html#.U4MwXCgvg3, in Norwegian

The advisors' work instruction is to give general tax advice, and not do case handling in specific cases for individuals. Anders, a SOL manager, describes the work of SOL as "helping people help themselves", they do this by helping callers navigate and use the agency web pages and online self-services. Marianne, one of the advisors, describes this part of her work as "I arrange a bit so they can use our systems since they may be quite difficult for the man in the street to get the hang of. [ ] What we give the public to use is not ideal you know, and then they call us when they can't figure it out".

Figure 14: A call advisor at work at her desk in the open office landscape of SOL.

The advisors show dedication in helping the callers. Often they remind a caller to check the figures of the pre-completed form so that he or she does not forget any deductions, or tell the caller about some particular deduction that is relevant. A foreigner working in Norway may be reminded by the advisor about the 10% deduction for foreign workers that all foreigners are entitled to during their first years in Norway, even though the original question was something else. "They need the little extra that makes them understand it and do it themselves the next time", Marianne says. In some cases they suggest workarounds for callers who are late in submitting the tax return form or who have forgotten to attach documentation about a claim. Advisors sometimes tweak the routines a little to help a caller who seems stuck. Many of the advisors consider the agency webpages to be difficult to use, and are quite understanding and helpful when a caller says he has not managed to use the online self-service system.

The advisors see themselves as spokespersons for the citizens towards the other units of the tax authorities. Anders from SOL management says, "SOL gets a sort of picture of what taxpayers are concerned about, but it's often hard to pass this on, or convey what has been said, to other levels in the department". They experience that citizens may occasionally experience difficult situations because of slow case handling or strict and unreasonable rules and regulations, and they will try to contact a case handler in another unit of the agency. Marianne describes her work in addition to answering questions as "I often send messages to [case handlers in] the region, or a reminder to case handlers if a case has taken a long time. I call a case handler when I see [..] that I cannot help and I think they can do it and then I call [...] and ask what have you done? And I log a little to second-level support who call back to the citizen within 24 hours". Anders from the management says "many of the requests to us are complaints – reminders about complaints. Why do I not get feedback? Those kinds of questions... They have nothing to do with advice work; they are repair work". The tools and tasks of the advisors are schematically described in Figure 15.
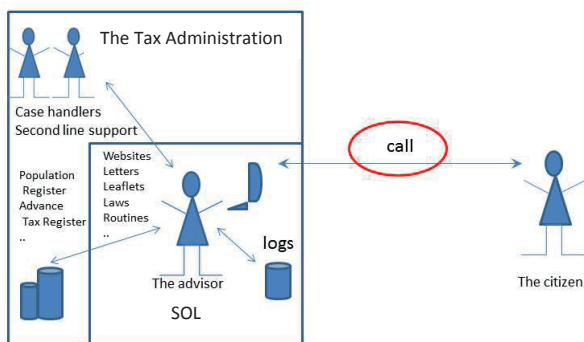
Figure 15: A simplified illustration of the tools and tasks of the advisor. The advisor answers telephones from the citizens. To answer a request they may use different paper-based or electronic information, IT systems and/or contact case handlers or second-level support in the majority of the Tax...

Call advisors follow a strict schedule when answering telephone questions. The rest of their working time is spent keeping updated on tax rules and regulations, and sometimes doing follow-up work for some calls. Some advisors also work as second-level support on specific topics.

Before an advisor logs onto the computerized telephone queue system and registers herself as "ready" for answering calls, she opens many of the computer systems that they use to look up personal information that the callers request. Many of these systems take some time to load, so they want them to be ready when the questions come. Many requests from the callers are answered by looking up personal data for this citizen, for example, "What is my tax class?", "I need a copy of my tax return form" or "Can you see if my complaint has been received?" In addition, there are many general questions asked that do not require any personal information for a reply. Advisors answer most general questions without looking anything up, although certain questions may need specific information such as "What are the opening hours of the tax office in my municipality?". He or she may also consult the internal or external web pages of the Tax Administration, or check public available books and leaflets about tax rules and regulations, for example "LigningsABC" (in English: TaxationABC).

Difficult topics for advisors are taxation of foreigners working in Norway or Norwegians working abroad, and questions about the Stockholder Register. Nils, a relatively new advisor, describes questions about stocks and shares as one of the most difficult topics, and in addition "commuting, and deductions are areas where I lack the whole picture; taxation abroad is a vast area". Per, an experienced advisor only mentions taxation of Norwegians working abroad as a difficult topic. The advisors sometimes ask a colleague if they do not immediately know the answer, this allows them to learn the answer as well.

The advisors need to "like to talk with people, many different types of people and be quite patient at times" says Nina, who works in SOL management. The advisors answer differently depending on how they interpret the caller's needs and ability to understand the answer or use the online self-services. Advisor Berit says that "the caller paves the way for how I will answer", and "when it comes to the reply to the individual then there is some you can answer more professionally than others. So I try to think, and give the reply I feel the person in question needs". Sometimes she pays attention to the age of the caller, and expects to a lesser degree that the caller can use online self-services if they are old. Marianne says "it is something about meeting people where they are". SOL is instructed to direct the callers to the webpages and the online self-services when possible, but as Nina says, "at the same time we will always have some phone calls where you understand that there is no point in talking

about online services, you need to find a good solution by other means, [] that decision or this consideration needs to be made for each call". Per says that he wants the callers "to feel safe [about their tax issue] when they have hung up and not start feeling uncertain afterwards".

Sometimes the contents of the personal information about the caller in the agency's databases will tell more about the caller and his tax-related situation than what the caller can explain. In cases where a caller asks a question that shows he or she has misunderstood something, or a caller describe an issue vaguely or erroneously, the advisor may look up the relevant personal information in the database and try to extract the problem from there. Often, understanding what the question is about resembles diagnostic work as described by Büscher et al. (2009). The result is not always a definite diagnosis, but will suffice to explain or move work forward.

Call advisors often provide help by disentangling issues. Callers often mix up the different public agencies, or do not understand how they can handle a difficult or undesirable tax situation. By disentangling the question, the advisor reduces the complexity of the issue and opens up a space for action for the caller so that he or she may be better able to follow it up herself, perhaps by writing a letter of complaint or contacting her employer who has made a mistake. Some detailed examples of disentangling are given in Bratteig and Verne (2012a, Paper 1).

The tax authorities and the citizens communicate through a double level language (at the least) as described by Robinson (1991). They communicate both through and about the forms: The tax return form and the form for changing a tax card are both means of communication between the tax authorities and the citizen, and the citizen and the advisor communicate about the forms themselves in many of the phone calls. The content of the online forms communicate to the citizen which tax-related data the tax authorities already has gathered about him or her, and the citizen may communicate to the tax authorities via the same forms if anything needs to be changed or added.

Opinions vary between advisors whether questions from citizens have changed after the option of "silent consent" was introduced in 2008. Some say that callers ask questions that are more informed because they can look up information on the Internet, but others claim that the callers now know less about doing taxes. Nina says that questions that callers previously asked when preparing their tax return form now come later that year when citizens have received their tax assessment. If they did not check their pre-completed tax return form before accepting it, they might query the tax assessment when it arrives.

4.4 The advisor in action

In this chapter I will describe a «typical call» with a focus on how the advisor acts before, during and after the call, emphasising the technology that the advisor has at his or her disposal to respond to requests from callers. The specifics of each call will be presented in the next chapter. Work practices, the palette of computer programs in use and their names are in continuous development, and this description applies to the time of the fieldwork.

First I will describe the computer programs the advisors used in their work. An overview of the computer programs in use before and during telephone duty is given in Table 2. As I spent more time co-listening, I learned more about the tools they were using, and realized that understanding their use of tools was a key to understanding how they approached a request.

Their palette of tools both enabled and constrained how they were able to help the callers. Some information was easily available and some was not. A caller could ask them to do a service that is technically possible but routines specify that the advisors should not do this. On other occasions callers ask for services that would be helpful, but which are neither available technically nor organizationally.

Call advisors keep track of their daily and weekly telephone schedules via the program Teleopti. This program manages and optimises the workload from the telephone calls. It estimates the traffic load according to the time of day and time of year and sets up each advisor's daily schedule. Because doing taxes takes place in an annual cycle, the load is at its maximum at certain times of the year, for example immediately before the deadline for the tax return form. Another pattern is that many people call SOL at lunchtime. Historical data is used to estimate traffic load and set up a schedule that will meet this. Call advisors start their workday by checking their telephone schedule in Teleopti.

Before duty, the advisor often looks for tax-related news on the intranet Skattenettet ("The Tax net"). Here the advisor can check if there are any events or new regulations they will need to know. Here they can also find information about undelivered paper mail to individual citizens that has been returned to the tax authorities.

SOL use IP-telephones for all advisors, see Figure 16. These are coupled with the computer program Consorte Pulse that administers the telephone lines and the "loop" of advisors who are on duty. An advisor receives calls from all over the country. Pulse keeps track of the duty schedule for the advisors, and the advisor's duty starts with signing on Pulse and clicking "*on duty*". However, before he or she does this, the advisor opens the computer programs he or she expects to use during the calls. These take some time to open and log in to, and they need to be ready before the calls start coming in.

Figure 16: The IP-telephone used by the tax advisors. The thin client PC is to the right.

The palette of computer programs that are used varies according to which telephone lines the advisor is answering, as they relate to different tax areas. In the following, I will describe the programs most often used by call advisors answering the lines for personal tax. The palette contains some quite old programs and some that are new. Certain older programs are accessed via CICS to central databases at the Directorate of Taxes. These are the population register and the tax return form register. The advance tax register is accessed via a separate UNIX-based system called FOL (Local advance tax system). The older programs have rather old-looking alphanumerical screens where the advisor must use alphanumeric codes, fill in forms to access and update information.

In the advance tax register, the records are organized according to the citizens' home municipalities. There are five separate programs that need to be opened, and each corresponds

to a geographical region. To look up a caller in this system the advisor needs to find the caller's municipality number first and look up the citizen there. The advisor has more functionality and a more finely-tuned set of commands for reading and editing the tax card information than what is available to the citizens using the online self-service. The system for managing tax return forms is DSB, which stands for "Datastøttet selvangivelsesbehandling" ("Computer supported tax return processing") and was initially developed in 1993. SL, the new net-based program for tax return forms and tax assessments was launched in 2009, and is the system used by the case handlers. This system is not organised in regions and is easier to use for new advisors, but does not contain historical data from before 2009. The advisors use it mainly for lookups of tax return data as they cannot do case handling, however, the advisor can write comments to the case handler on behalf of the caller. Other information about the call is only registered in SOL log, which is not available to case handlers.

All advisors use the population register to look up the citizen's address and national identity number, or D-number for foreign workers in Norway if needed. A program called onDemand was used to look up mass-distributed letters from the Directorate of Taxes to the citizens. Letters related to individual cases that were sent from a case handler to a citizen are registered in ELARK, the archive system of the agency. Some of the advisors also use special databases such as the property register.

For registering each call, the advisor uses SOL log, which is a customized BMC Remedy application. This is a program that keeps track of all calls and where the advisor classifies the call into a set of categories for statistical reasons. It is mainly used for statistics, internal accountability reasons and workflow. The SOL log has functionality that allows the advisor to refer a call to second-level support if expert advice is necessary on a topic, or to the document centre that re-routes the log to a case handler, if the call is about a question in an individual case. This registration of calls caught my attention early on during the field work, and I investigated and analysed how the telephone calls are registered and for which purposes (Verne 2015, Paper 7). The categories for registering a call indicate an introvert perspective and a managerial agenda. The registration focus on administrative issues to support the workflow features of the log, and many of the experiences of the caller that could explain why they call are silenced.

Program	Purpose and use	Run by:	When wrt call
Teleopti	Scheduling telephone duty	SOL	Before/during
Intranet ("Skattenettet")	Tax related News Returned mail	The Directorate of Taxes	Before During
Consorte Pulse	Receiving the calls, managing "lines"	SOL, commercial software	Before/during
Population Register	All citizens and foreigners working in Norway, look up address and national identity number	Directorate of Taxes remote accessed via CICS	During
DSB	Look up Tax Return Forms for the last 10 years	Directorate of Taxes remote accessed via CICS	During
Advance Tax Register (5 programs for the municipalities)	Look up and register tax card data	Directorate of Taxes, remote accessed via FOL/Unix	During

SL ("System for Ligning")	A newer system to look up tax return forms	Directorate of Taxes	During
SOL log	Log record of all calls, and communication to 2nd level support	SOL, in house development based on BMC Remedy	During
onDemand	Look up mass distributed letters	Directorate of Taxes, based on commercial software	During
ELARK	Case handling history for individual citizens, look up individual letters	Directorate of Taxes, based on commercial software	During
Property Register	Look up (and change) property values	Directorate of Taxes	During
Stock Register	Register of stockholders	Directorate of Taxes	During

Table 2: An overview of the computer programs in use by call advisors answering calls on "personal tax" in this study.

A typical work process before and during telephone duty will be as follows: Before an advisor starts his telephone duty, he takes a quick glance at Skattenettet, opens CICS, five regional systems for advance tax, DSB, the population register, SL, and SOL log. He opens Pulse, puts on his wireless headset and makes sure it is connected with the phone, and then he clicks the "ready" button in the green Pulse window.

The phone rings as a usual phone does, and is answered by pushing a physical button on the physical phone (see Figure 17 a). The telephone number of the caller is displayed both in the Pulse window and on the telephone. Many advisors enter the telephone number in a new entry in SOL log at the beginning of the call, while the caller presents himself and describes the issue. If a lookup in one of the databases is needed, the advisor will ask for the national identity number of the caller (or the citizen in question, if someone else calls on her behalf) and enter this number into the field in the log, where an automatic lookup of name and address from the population register fills in these fields automatically.

Call advisors do not disclose personal information about address, bank account, national identification number, or economic affairs over the phone, not even to the caller about his or her alleged personal information. However, they can confirm an account number when the caller says the correct number.

Figure 17 a): The advisor answers the phone when it rings by pushing the answer button. We can see the green Pulse window administering the incoming calls on the computer screen.
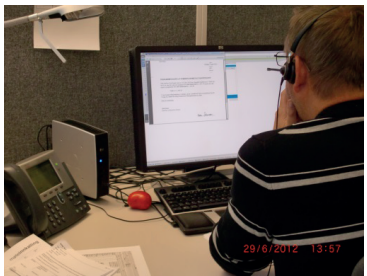
Figure 17 b): The advisor has retrieved a letter to a taxpayer from one of the databases and is reading it on the screen.

If a database lookup is needed, the advisor does this, and perhaps explains and discusses the figures with the caller, see Figure 17 b. How readily advisors ask for a national identity number and look up personal information, and how helpful they are if the caller does not know her national identity number varies. Some advisors seem to prefer to answer a request by looking up personal information in the databases, and others seem to prefer to answer with general information where no personal identification is necessary. Sometimes the advisor will print out a form or a tax assessment and walk to the printer to pick up the output, while still talking with the caller. They may also put the print in an envelope, and handwrite the caller's name and address on it during or immediately after the call.

If the advisor finds out, perhaps after a lengthy conversation, that he cannot answer the request, he will "log the call", which means referring it to second-level support. This is done via SOL log. In such cases, the advisor will categorize the call and describe the issue together with the caller in the free text field before he clicks the "send" button. Second-level support consists of experts on different topics who will pick up the call from the log and answer it by calling back within 24 hours. The advisors are instructed to register all calls, even the very fast and simple ones, by allocating a category and clicking "Answered" or "Send" (for referrals to second-level support).

On some occasions, the advisor needs to do some follow-up work after the call, for instance putting printed material in an envelope or adding to the log registration. They can click "follow-up work" in the Pulse screen to avoid incoming calls until they again click "ready". However, they are encouraged not to do very much follow-up work after the calls. In Table 3 below, an overview of this work schedule is presented in chronological sequence.

Before telephone duty:
Look up own schedule in Teleopti
Look up Skattenettet for relevant news, in particular changes in the laws and regulations
Open the CICS program, with access to Population Register and DSB
Open each of the five regional systems for advance tax
Open SL
Open SOL log
Open Pulse and check the lines
Put on headset – click "On duty"
During the calls:
Phone Rings: Answer by clicking the "answer" button on the phone
Create a new SOL log entry
Read the incoming telephone number on the phone or the Pulse screen, copy and paste it into the SOL log window
Listen to the caller
Ask for more information/national identity number. Enter the national identity number in the SOL Log, and the name and address of the caller will be automatically filled in.
Look up in databases – see what is already registered
Explain the issue to the caller, ask further questions
Enter figures (out of routine)
Provide general advice
Print tax certificate/tax card/tax return forms
Sometimes: refer the citizen to second-level support or a case handler

Close the call, click register or send in the log.
If necessary: click for follow-up work. Afterwards, click "Ready"
Follow up: Pick up forms, if necessary highlighting entries for the citizen to fill out
Put prints in envelope.

Table 3: A rough chronological overview of advisors' response during calls.

Various errors may occur. There are some rare examples in my material where an advisor makes a mistake[20]. One advisor routed a call to a case handler instead of to second-level support; this caused him approximately 30 minutes of work afterwards to try to correct the situation. Second-line support will call back within 24 hours, but there is no such guarantee for contact with a case handler. Another entered data into the log record for the previous caller, because he forgot to save the previous registration. The possibility of an advisor entering wrong figures into the databases when talking with a citizen on the phone is one of the reasons that the routines instruct advisors to avoid entering figures. Advisors attempt to find a balance between the recommended practice of not entering figures, and deviating from this in cases of special need.

From my own material I have learned that some answers are of more help to the caller than others. For example, there is more than one way of applying for an extended deadline for submitting the tax return form. The fastest is for the caller to log on with the PIN codes and apply via an online form - this will give an immediate and automatic reply. Also formally correct, but slower, is to send an email or a letter to the regional tax office where the citizen lives. This approach will not result in a reply until a case handler has actually read the email or letter, and replied to the sender. I have heard advisors suggesting both ways.

4.5 The callers

Citizens call SOL for all kinds of tax-related questions. Marianne, one of the call advisors, described the callers as "Everybody calls us, all types, but there are quite a few who find taxes and figures difficult. It seems like... they catch sight of a form and get really stressed out [ ] even getting a letter from us is awful." Jan Tore, another advisor, said that "The people who call us are not necessarily Mr Average". He explains what he means. "That vague middle sector don't get in touch. It's the resourceful ones who call to test us and get advice on tax planning – about tax regulations [ ] and then there are people who [ ] can't cope with online services – who don't get the regulations, [ ] people who don't have the background for understanding taxes – and there are plenty of that type."

Citizens of all ages call SOL; however, according to the Tax Administration's own figures the age group of young citizens call the most (Berset and Stenehjem 2011, see also Figure 18). They are about to start their working life, move often, and establish themselves with housing, marriage and children. After around 30 years of age the curve falls steadily for both men and women. Among the callers over 50 years old, people in the age group between 60 and 64 call the most. This is an age group where many retire and their economic conditions may change substantially. This analysis is based on log data from those calls that were

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[20] I could not identify any erroneous or inadequate answers related to laws and regulations.

recorded by SOL advisors together with the national identification number[21]. For both men and women the curves peak at around 28 years of age (Berset and Stenehjem, ibid.).
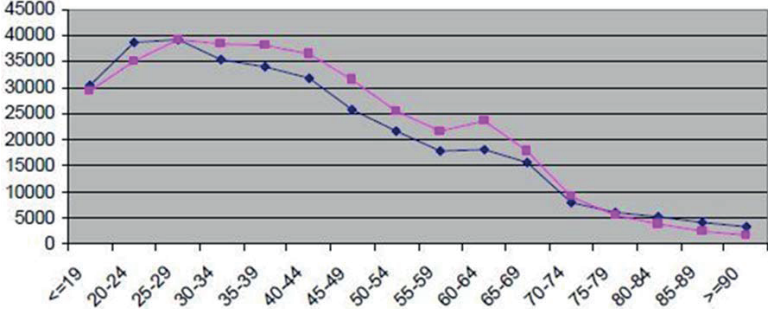

Figure 18: Telephone calls to SOL in 2011 according to age and gender (Berset and Stenehjem 2011, p. 4). These data are for all telephone calls on all lines taken together. The pink curve marked with squares represents women; the curve with blue diamonds

The Tax Administration finds it strange that young citizens call the most, considering that young people can be expected to be relatively more able to use online services than older citizens. This may seem a little paradoxical as online tax information and services are available and young people otherwise are thought to be proficient users of the Internet.

4.6 The call

The advisors talk about a "call" or a "conversation", these are the words that are used at SOL. However, there is not a one-to-one correspondence between a call and a problem, request or issue – which are analytical concepts used by the advisor and/or me. Some callers start the conversation by describing their situation ("I have married"), some request information or a service ("I need a new tax card"), and others describe a problematic event ("I have received this letter from you"). The advisor does not presuppose that the callers will always know what to ask for. Some callers may phrase a simple request which, when the advisor looks into it, can indicate a problem somewhere else; while others may describe an apparently big problem which turns out to be easily resolved by the advisor. Some callers relate about a difficult life situations, and doing taxes is problematic as a consequence of that.

Some calls turn out as conversations about a tax issue or area; this happens when the advisor for example gives general advice about percentage-based tax cards and when they are appropriate. In some cases the advisor cannot figure out what the caller wants, and might even suspect that a caller is trying to get illegitimate access to information about third parties, or shopping around for preferred advice. There may be many calls from the same citizen about one underlying issue. One call may last for three minutes, but if the same person calls again later, several calls may be needed before the issue is resolved.

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[21] For those calls where the citizen asks for general information, such as opening hours etc, the call is registered without the caller's national identity number. In addition, depending on the question, the practice of asking for the caller's national identification number varies between the advisors. Some advisors ask for this early on during the call and look up personal information; others initially answer more in general terms.

Often a citizen will call back if he did not understand completely how to follow up – as some of the later examples will show. On the other hand, some calls can be about two or several topics or questions ("while I have you here, I also need to ask…"). In generic situations in this thesis, I use the notions "request", "issue", "question", and "problem" interchangeably. In the transcripts of the calls I aim to be accurate about how the caller formulated herself; whether the words "ask", "question" or "need" were used by the caller. In the descriptions of what the call was about, I use "request", "issue", "question" or "problem" as my interpretation – which is not necessarily what the caller said herself.

In the next chapter I will give an analysis of the calls and illustrate what they show to be sufficiently problematic for the citizens that they make a phone call to SOL.

5. Into the telephone calls

An analysis of telephone calls to SOL provides us with windows into the lives of the callers. In this chapter I will give a presentation of the telephone calls and the insight they provide into what makes doing taxes difficult. Viewed as a whole, a picture emerges of citizens going about their ordinary lives and businesses, and at some point in time, often because of a change in their lives, their attention is directed to tax-related issues that are usually of little concern to them on a daily basis. They may be aware at the time of the event that they need to change their tax card when they start working or become a single parent for instance, or they may be prompted some time after the event. Something strange or undesirable may occur, such as a tax assessment that says he or she paid too little tax the previous year and will need to pay the rest, or a citizen suspects that too much tax is being withheld from her monthly salary.

Citizens go about their lives, and when they need to address a tax-related issue they meet a formal world of rules and forms, illustrated in Figure 19. There are many kinds of incomes and deductions in the system, and to get a correct tax assessment the citizen will need to interpret and categorise which parts of his or her life are covered by the tax laws and regulations and how this fits into specific items in the tax return form. This process of interpreting and categorising is analogous to how the work of a company is reduced to a small number of predefined codes when entered into a timesheet (Bowker and Star 1999; Brown 2001).
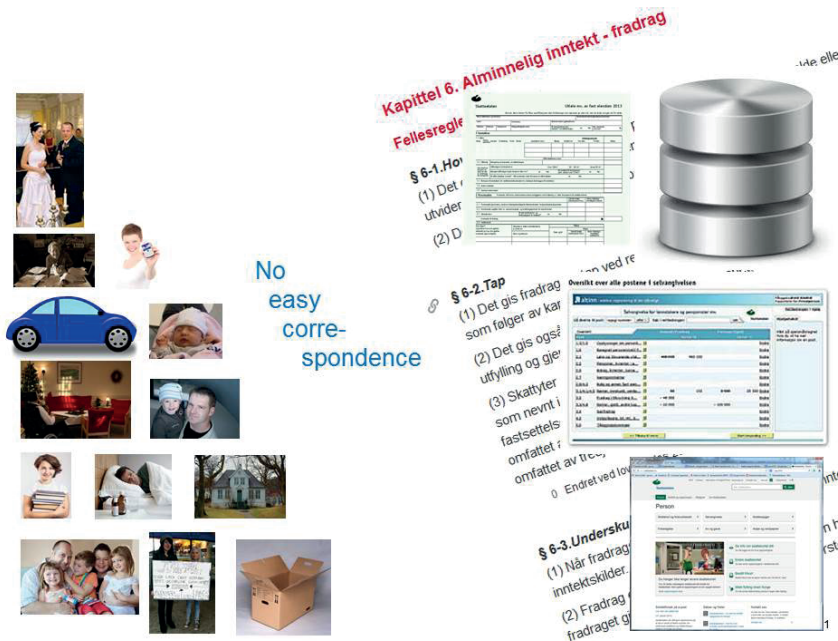

Figure 19: There is no straightforward correspondence between elements of citizens' lives (to the left) and the formal rules and forms related to doing taxes (to the right).

My analysis has identified some challenges between the citizen and a correct tax assessment. Problems may occur at various stages in the communication between the citizen and the tax authorities, illustrated in Figure 20. Correct use of the tax rules and regulations is

indicated by the little picture of the red book of the Norwegian Laws to the right. From left to right in Figure 20, these challenges are:

1. The citizen and his or her life circumstances: Life events and circumstances may change the taxation of the citizen, and also influence the citizen's ability to do his or her taxes
2. The shape-sorting box: For the citizen to correctly interpret and classify events and circumstances in own life
3. Using the online services: May be a challenge in itself
4. Understanding internal structures: Some requests show a need for the citizen to understand the internal structures of the tax authorities
5. Technical issues and peculiarities: Technical errors may occur, as well as technical quirks and peculiarities
6. Manual tasks and documentation: There are still some manual tasks that are not covered by the automation of tax
7. The tax laws and regulations: May be both difficult to understand and to apply correctly
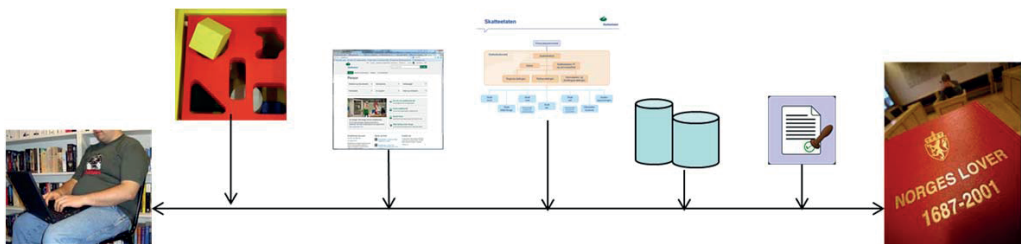

Figure 20: There are many challenges before the citizen (1, to the left) understands the tax rules and regulations (7, to the right) and succeeds in following them correctly. The first is the "shape sorter" of correctly interpreting and categorising (2), then there is the use of the web page and the online services (3), understanding internal structures (4), technical issues and peculiarities (5), and providing documentation and other manual tasks that are not automated (6).

The various challenges will be presented in detail in the following, together with some illustrating examples from the telephone calls. Many calls indicate problems with several challenges along the axis from the citizen to a correct tax return, in such cases I have aimed to present the call at the most prominent challenge or the first occurrence (from left to right) along the axis. [22]

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[22] The line is a simplification meant to illustrate that there may be several challenges to work through before the citizen has done his taxes. If the citizen has managed the "shape sorter" stage and understood what she needs to do, he or she might have problems with using the online self service. The process could have been illustrated by a graph or a circle, indicating that there may be several challenges with no linear ordering between them.

5.1 The citizen and his or her life circumstances

Marianne, an experienced advisor, points out that many events in the lives of citizens, such as having a baby, marrying, or retiring may change their taxation. In such situations the citizen may need to manually update their personal information in the Tax Administration databases. The first example illustrates a caller whose life situation has changed. This caller has retired recently and has received her first pension payment from NAV, the welfare agency.

> *Example 5.1.1: The caller opens by explaining that she has recently received her first pension payment. She had expected that no taxes would be deducted, but the welfare agency has withheld 30% of her payment. Nils explains that this has happened because she has not updated the basic information for her tax card. The caller seems surprised and says "They told me nothing about this at NAV". Nils will post her a form so that she can update her tax card information. The caller explains that she will need an exemption card, and Nils explains how she shall fill in the form. The caller explains that she received her first pension payment on Friday. Nils fills in the entries in the form with the caller's pension and already paid taxes, and closes the call by saying "You just sign there, and return the form to the address listed". After the call he comments to me "People think that everything happens automatically. But it doesn't". (20111121-10)*

Many callers think that their taxation may change but they do not know for sure. This caller was not aware that she herself would have to manually update the information in the Tax Administration's databases for the correct amount of tax to be withheld from her income when she retired. The advisor helped by applying the rules to the personal situation. Nils helped her by explaining why NAV withheld 30% and what she can do to correct her figures.

Marianne says that "Tax card class II or class I is a recurrent topic. 'We have had a baby, we are eligible for tax class II' or 'we have married and we want class II', but they do not necessarily get it, you know". Deciding if a married couple will be taxed in class I or II is not a straightforward matter, and many will need to call to check it out.

Many calls illustrate circumstances in the citizens' lives that trigger a call to SOL. Marianne describes the background for some of the calls as "people ... do not keep the things [they receive from us], they do not keep prints, they do not keep the PIN-codes and [ ] then they get desperate because suddenly they need it - preferably yesterday, and it will take some time to receive documentation from us". Before citizens can use the online services, they need to have their PIN-codes ready for logging in, and they might need some documentation of their current situation. If they cannot find it, they call SOL.

In many of the phone calls, I heard about life situations that in themselves would make it more difficult for the citizen to handle his or her tax issues. Some had recently lost a husband or wife, and in addition to the emotional strain had little knowledge about doing the taxes, since this had been conducted by the deceased. One man was in hospital, seriously ill and confused, but still tried to handle the value assessment of his house on the phone to SOL. Many were recently divorced and had become single parents with a more pressed economical situation. Others had lost their work; some had work that brought them far away from home.

One man was calling from a fishing vessel far out in the sea; another man was homeless and living on welfare benefits.

Some citizens described both sad and difficult life situations where it is easy to understand that doing taxes receives little priority, as illustrated in the following example:

> **Example 5.1.2:** *A single father calls. He speaks another Nordic language but calls from a Norwegian phone number. He opens with "Everybody I talk with says that I pay very much tax", and continues with "I do not understand this percentage withholding". Morten receives his National Identification Number and looks him up in the Advance Tax system. The caller explains that he became a single father and that it happened some months ago "because then she died", "the child was born prematurely" and he was on leave and then he lost his work. Now he receives unemployment benefits from NAV. We can see the birth date of his youngest child in the Population Register. "I will help you here and now", Morten says, and enters new figures into the Advance Tax register. He proceeds with checking every figure: "Do you receive a child pension from NAV?" "Yes", "Do they withhold tax from this as well?" "Yes, 30%", but then he becomes unsure and suggests that perhaps they do not. Morten enters new figures and calculates that the new tax will be 17%. The caller is very satisfied and says that this is what the other single parents say they have. Morten suggests that for "safety's sake we go for 20%" and the caller agrees because he wants to avoid having to pay underpaid tax later. Morten will issue his tax card, and he will send him a copy as well so that he can give it to the pension agency. "Thank you so much for your help", the caller says. Morten says that "preferably you should use the Internet for this", but the caller answers "Yes, but I do not understand it". Morten will print and send a form he can later use for changing the tax card if he starts in a job. He prepares it so that the caller will only need to change the gross income. (20120111-16)*

The advisor could hear that the caller had not a complete overview of his economic situation, and guessed there was a risk that he would not be able to update his tax card information himself. This caller received support for duke autonomy from the advisor because the advisor wanted to help him out of an unnecessarily tight economic situation, which could make his life even more difficult. As a single provider for two small children, this could have consequences for his children as well.

The calls in this section exemplify events and circumstances in the lives of citizens that may lead to a call to SOL. These are summarised in Table 4.

Changes in the life of the citizen	Need to update personal information in the databases
	Need to check out how the changes influence taxation
Circumstances that trigger a call	Cannot find materials previously received from the tax authorities
	Unexpected events, such as too much tax being withheld
Circumstances that make doing taxes difficult	Working far away, or being in hospital
	Practical problems with email and Internet connections
Sad and difficult life situations	Need for duke support to avoid a tighter economic situation than necessary

Table 4: Summing up events and circumstances that may lead to contacting SOL.

5.2 The shape-sorting box

The shape-sorting box illustrates the challenges of identifying and interpreting events or circumstances from one's own life and match them with the available set of categories (Suchman 1994a; Suchman 1994b; Bowker and Star 1999). Many citizens do not understand which information is needed when they fill in a form, and it can be difficult to find out what is right or wrong about taxes. Jan Tore explained that many people call for a confirmation of their own interpretation of the rules and regulations.

A personal example may illustrate that different interpretations may make a difference in taxation. My little son of approximately 5 years was inheriting a pension from my aunt. In her tax assessment this pension was classified as "age pension", and my son inherited it as an annual payment for some years. The payments from the insurance company were categorised the same way, and the pension was entered in my pre-completed tax return form as age pension. I thought that the categorisation followed my aunt even though the receiver was a child.

At that time I tried out a commercial software program for doing the tax return form. When entering the pension income of my son in the record for "age pension" I noticed there was another record for "child pension". My curiosity was stirred, and I checked up the descriptions of "child pension" versus "age pension". It was not completely clear from these descriptions whether my son's pension income would correctly be categorised as "age" or "child" pension, but "child pension" was not ruled out. However, when I entered the income in the item for child pension and made the software simulate the tax assessment, I could see that the tax calculation was changed. The reason was that when the pension income was entered as "child pension" my tax was lowered by about 2000 NOK compared to when it was entered as "age pension". That settled the case for me – in the tax return form, I entered the income as "child pension" and explained the situation in the text field for additional comments. I received no changes or corrections from the tax authorities about this categorisation of the pension income. Every year that my son received this pension, I had to re-categorise it in the pre-completed tax return form to reduce the taxation[23]. The difference had to do with how these two kinds of pensions influenced the surtax.

I will compare the need for interpretation and categoisation of events and circumstances in the citizens' lives with posting blocks into a shape-sorting box, see Figure 21. The citizen's life is illustrated with wooden blocks of different shapes, sizes and colours; and the interpretation and categorisation necessary for doing taxes can be illustrated as fitting them into tax slots. Some of the blocks fit nicely into the slots, some do not fit, some fit but are too small, and some can be seen to fit if they are turned around and seen from another angle.

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[23] The pre-completed figure for age pension is corrected in item 2.2.2 in the tax return form in Figure 4, Section 3.1.
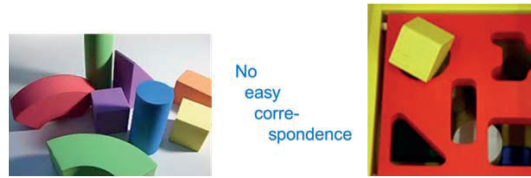
Figure 21: Elements of the citizen's life compared with blocks that are to be fitted into the slots of the tax authorities' sorting box of forms, sheet items, laws and regulations.

Doing taxes often involves filling in forms. Finding the correct item on a form to register an income is a typical "shape-sorting" issue. In this respect it doesn't matter whether the citizens fill in an online or a paper form, as both require the same process of finding a suitable category for the particular type of income. The next example is a caller who has managed the challenge described in the previous chapter and was aware that she had to update her personal information in the tax authorities' databases when she retired, but she did not understand how. The following example describes how she requests the advisor's help in understanding what is needed to fill in the form:

> **Example 5.2.1:** *The caller says that she will retire this month. She has talked with a SOL advisor last Friday, and she has received a form for changing her tax card. She needs help to fill it in. "What is included as income? What goes into entry 5.1?" Kathrine explains that costs for refinancing are deductible. The caller has more money in the bank, and Kathrine explains that she will need to check the value of her car; perhaps she has higher interest incomes now, and she will also need to check "other income". The caller says "This is not so easy; I would not have managed it without you". (20111017-16)*

Even though the term "income" is easy to understand on a superficial level, the tax rules specify that there are different types of income, such as "work income" and "capital income". Some kinds of income are tax free. Understanding how one's personal economy should be interpreted is not straightforward but necessary in order to enter the correct figures in the various income categories in the form. By going through her tax card, Kathrine helps the caller with finding out how the change in her life situation will affect the need to update the various database entries.

"Shape-sorting" issues are often about terminology. "We cannot assume that people who call us have a clear conception of what they want", says Jan Tore. In particular, young citizens have not (yet) learned the correct tax terminology and what they need to do:

> **Example 5.2.2:** *A young person calls and says that he has a table-based tax card. "I receive a large refund in underpaid tax". Morten says "Try to hand in part 1 to your employer. Otherwise, go online and tick for 'several employers' ". (20120111-19)*

The caller expressed himself inconsistently; underpaid tax does not lead to a refund but a bill. The advisor understood this inconsistent terminology as an indication that the caller was not very familiar with doing taxes. He interpreted it to mean that the caller had received a large refund of excess tax paid the previous year. His first advice indicated that he thought the caller had not handed in his tax card – which would explain the high excess tax – and he told him to do so. His second advice was aimed at giving the caller a more well-suited tax card for

his current work situation as a percentage-based card will be best if the caller receives irregular salary payments. Morten thinks that many people understand little of tax, and adds: "This particularly applies to young people, those who have never seen a tax return form before".

There are many forms, and in many cases, a citizen will need to use a form she is not familiar with. Finding the right form is also a "shape-sorting" issue. To ask for a particular form the citizen first needs to know that the form even exists. In addition, it will be necessary to know the right terminology to be able to search online for information, as in the following example:

> *Example 5.2.3:* The caller is looking for a form to report advance tax on inheritance. Morten explains that the form is called «Gift report». He looks up www.skatteetaten.no, the external web pages of the Tax Administration, and finds the correct form number there, and asks her to search for that number. The caller says that she has already found that form, but was in doubt whether this form was the correct one since «death date» was mentioned there. In her case the inheritance giver is still alive. (20111031-14)

The caller had actually found the right form online, but was not sure it was the right form because of the terminology used. The advisors cannot trust that the callers use the right words when they state their requests, and often a conversation starts with sorting out what a citizen really needs, as in the following example:

> *Example 5.2.4:* The caller requests a tax certificate ("ligningsattest") to ask her bank for a loan. Nils says "That says nothing, are you sure that is what you want?" The caller reads out loud a text that explains what she will use it for, and Nils understands that she needs a copy of the full Tax return form. He prints it out, puts it in an envelope and sends it to her address recorded in the population register. (20111010-3)

The full tax return form is needed when asking for a bank loan or applying for certain benefits. There are many calls like this. The tax certificate is not sufficient in situations where the citizen is required to document details of personal fortune or debts. The advisors know the difference.

In many calls, the citizen is clear about her need, but does not know how to proceed. The next caller wants to change the tax card from a table-based card to a percentage-based card. This can be done both in the paper form and online, but it is not immediately obvious what she needs to do.

> *Example 5.2.5:* The caller wants to change her tax card; she has a table-based card now and she needs a percentage-based card. Morten receives her national identity number, looks her up in the Advance tax system and calculates the percentage to be 25% based on her figures. He issues the new card. After the call I ask Morten what she could have done if he had not helped her. He explains that she can tick a box for "more than one employer", even if there is only one, because this will force the system to issue a percentage-based card. I comment that people perhaps do not understand this immediately, and he replies, "This is not very well explained". (20120111-4)

Ticking the box marked with "more than one employer" will force the system to produce a percentage-based tax card. To do this even when the citizen only has one employer, will require some understanding of how the tax system works.

Citizens are under oath when they fill in and submit their tax return form, but no requirements about correctness and preciseness apply for filling in the form for ordering a tax card. It is not illegal to estimate expected income or fortune incorrectly when ordering a tax card. However, it will influence the amount of tax withheld in advance, and consequently also salary payments. When the tax assessment is done the next year, a citizen with an incorrect tax card may have to pay underpaid tax.

Marianne points out that the press often writes about taxes in a way that is not completely correct and "then somebody calls the Directorate of Taxes" who tries to explain. Citizens often receive conflicting or confusing information. Making errors may have serious consequences for the citizen. Jan Tore said that the Tax Administration is "an agency with enormous possibilities for sanctioning you if you make a mistake, and I think this prevents people from finding out things on their own".

Per once said that "The winners are those who have used the old paper form", indicating that those who have experience from using the older paper forms have acquired some understanding of the tax system that helps them to understand and navigate the current more abstract electronic landscape.

"Shape-sorting" issues are about isolating and matching events in one's own life with the rules, forms, and fields in the forms created by the tax authorities. They are often about terminology and what a term or tax concept will mean in practice for a citizen. The example calls that illustrate "shape-sorting" issues are summarized in Table 5.

Tax terminology with specific meanings	The citizen will need to know the correct terminology to find the right form, fields, box to tick etc.
What the various fields in the form mean	The citizen will need to understand how elements of personal economy need to be divided up and matched with the sheet items

Table 5: Challenges in matching citizens with the tax authorities' "shape sorting box".

5.3 Using the online services

In addition to the challenges described previously, doing taxes online introduces some extra challenges. The Tax Administration offers a few online transactional services for citizens. These are changing or ordering a tax card, ordering an exemption card, changing and submitting the tax return form and registering a new address in the Population Register. In addition, the citizens can also navigate the Tax Administration website and search for information about tax rules and regulations.

The tax return form is produced by the Tax Administration but available to the citizen through a common portal for public services, the Altinn Portal. The tax card services are

available through the Tax Administration web pages. These services connect to different databases within the system architecture of the Tax Administration, and are presented to the citizens as different services. A citizen needs to log in separately for each of the online services. Login services are run by yet another public agency. There is no service like "My page" where the citizen can look up and edit all their personal tax-related information.

Many callers report that they have tried to use the web pages but have not succeeded, indicating that the online services are a challenge in themselves. First, a citizen needs to be able to navigate and in some cases log in to succeed in using the online services. The following is an example of a caller who did not find what she needed on the web pages:

> *Example 5.3.1: The caller needs a copy of her tax return form. "I tried the web pages, but got completely lost". Kathrine says, "you can pick it up from Altinn (the portal)". The caller answers "I did not find it there, only the taxation". She adds that she is at work now and does not have her PIN-codes for logging in. Kathrine offers to send her a copy of the tax return form in the mail, and the caller asks her to send it to her husband too. (20111128-20)*

Kathrine first tried to support the caller's do-it-yourself autonomy, but changed to the duke autonomy during the conversation. The caller reported that she had succeeded in logging in to Altinn but that she did not find her tax return form there. When Kathrine offered to help her to navigate in Altinn, she said that she could not log in because she did not have her PIN-codes at work. Instead of telling her where to find the tax return form in Altinn so that she could try again later, Kathrine provided duke support to help her out right there. Many calls are about problems with PIN-codes, and Marianne says that "PIN-codes … are [a] recurrent topic all year round".

Even though a citizen has managed to find the service in question, log in and fill in the form online, this may not give the expected outcome. In the next example it is not clear for the advisor what had happened:

> *Example 5.3.2: The caller says that she has asked for a new tax card some time ago, in January or December. She explains that she had logged in using her PIN-codes and made some changes. Morten asks for her national identity number, logs into the Advance Tax System and looks her up. From the status information, he can see that no changes have been made to her data. He explains a little how advance tax is calculated. The caller gives the figures for her salary, and Morten picks up a small handheld calculator and does some calculations. He enters the new figures she provides and gives her general information about a table-based tax card versus a percentage-based tax card. He concludes the call by issuing her new tax card. (20110128-1)*

The advisor cannot figure out from what the caller says and what he can see in the database whether a user error or a technical error has occurred. He cannot exclude that a technical error has occurred somewhere in the Tax Administration's systems. However, because the caller said she had tried, and he knows that many callers report that the online services are difficult to use, he will help her directly instead of directing her to attempt the online services herself a second time.

In the following example, the caller had tried to use the Internet but gave it up.

Example 5.3.3: The caller has already received a tax card in September. Now she wants an exemption card. She says that she is a student. Morten asks her to estimate her annual salary so that he can assess whether she is eligible for an exemption card. She tells him that she earned around 20 000 NOK this summer and was withheld 50% tax. Morten reminds her of the holiday pay she probably has received already. She confirms that she has received it. Then he asks if she plans to work during the Christmas holidays, and she confirms that she will. He then makes a Tax card with 10%, which she is satisfied with. He explains that she will have to order a new one for the following year. She adds that she had tried to do this herself online without succeeding. (20111031-28)

It is not clear from this call why she gave up her attempt in using the online services. It could be "shape sorting" issues and perhaps she needed guidance in how to estimate the figures she needed to fill in. After this call Morten commented that as a student she should be able to use the online service for changing and ordering the tax card. He guessed that her calculations were wrong, and that she would earn too much to be eligible for an exemption card. However, as stated previously, calculating erroneously is not illegal, but may result in a bill the following year for the outstanding amount.

The next caller is another young student. In this example, he had succeeded in using the online service, but he had not received the tax card and he wonders why:

Example 5.3.4: The caller opens by stating his name and explains that he has ordered a tax card online. After some clarifications, Yousef understands that it is an exemption card. The caller has not received anything, and wonders if it has to do with his change of address. He is not sure which address is in the register. Yousef looks him up in the population register and finds that the address there is the same as what he says it is. However, Yousef can also see that he has previously earned more than the cap value for an exemption card, and explains «There you've got it! You have already received a tax card earlier this year». He explains that in this case he cannot order an exemption card online the simple way. Yousef pilots him to log in with the PIN-codes, and explains which figure he needs to alter in the online form in order to change the tax card : «Set it to 39 950». Yousef navigates the form only from memory. This form requires the applicant to explain the reason for the reduction in estimated income. (5-20111121)

The reason this caller had not received the new tax card in the mail was that he had not used the necessary method for ordering a new tax card. He had tried sms that did not require a login with PIN-codes, but this way did not function for him because he had previously earned too much. Without being aware of it, he was not eligible for the simplified service. After the call Yousef exclaims "Twenty something year old student is not able to order an exemption card! Who are these pages then made for?" He explains that SOL has sent many suggestions to the web editor in the Tax Administration about improving the web pages based on their experience from the calls, but he thinks that they have had little influence.

In the interview with Marianne, I asked her about examples of what callers typically struggle to find answers to online, and she replied "typical in cases of doubt, whether this is a deduction or not a deduction". She also points to the connection between the web pages of the Tax Administration and the phone calls. She considers the web pages of the agency to be

difficult to use so that people call instead[24]. She also points out a relation between outgoing letters from the tax authorities and incoming phone calls – when the citizens receive letters from the tax authorities that they do not understand, they call SOL. Regarding letters sent to citizens about new property taxation values, she said "They create work for us; it is we who receive it".

I find the examples of young people who cannot use the online services to be of particular interest. During one of my co-listening sessions I read a news notice on the Intranet from the director of SOL. He wrote that SOL receives many calls from young people, and asked "What do we do wrong?" He indicated that they could expect young citizens to be more able to use the online services than older citizens.

Challenges related to doing online taxes can be summarized in Table 6.

Unsuccessful use of the online services	Not being able to navigate the web pages
	Not being able to log in, problems with PIN-codes
	Citizens may need guidance in filling in the online form (shape sorting issues)
Successful use with unexpected outcomes	Technical errors cannot be excluded
	User errors cannot be excluded
	Some services require that the citizen is eligible for the service without the citizen being aware of this

Table 6: Summing up issues from doing online taxes.

5.4 Internal structures

SOL is organised as a national service, and a caller in the north of Norway may be coupled to a phone advisor in a city in the southeast. During the phone calls, many callers refer to the weather outside and use words like "here" and "my tax office" indicating that they think that the advisor is physically located at the tax office in their vicinity. Callers say that they want to show up at the tax office and talk with the advisor – who may be in a different part of the country, as in the following excerpt from a call:

> *Example 5.4.1:*
> *The caller: If I do not receive the tax card within a week, I will come and pick it up.*
> *Morten: Yes, please feel free to drop by.*
> *After the call he says to me: «She thought that her phone call came to Larvik, and then I say nothing». Morten is not physically located in Larvik[25]. (20120111-22)*

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[24] The Web pages of the Tax Agency were completely redesigned and made available to the public at the end of my field work at SOL. Marianne's utterance concerned the older version of the web pages.

[25] All personal and geographical names are pseudonyms.

If this caller shows up at the local tax office and asks to talk with Morten, she may be disappointed or confused. To understand that the call is not answered by the local tax office requires some kind of understanding of internal structures and procedures. This example concerned physical organisation. Other calls illustrate that citizens may need to understand organisational structure. Many contact SOL with a request that is related to the tax collector, who is a municipal unit. There are many examples like the following:

> **Example 5.4.2:** *The caller presents himself as Karim. He wants to pay his taxes. Marianne gives him the telephone number to the tax collector in the municipality where he lives. (20101104-1)*

The advisor cannot redirect the call from this citizen. The tax collector is part of the Tax Administration but is organized within municipal administration. Other phone calls include needs voiced by citizens which cannot be solved by the advisor at the time of the call because of internal routines and procedures within the Tax Administration. In late November, the next caller wanted to be well-prepared for the coming year:

> **Example 5.4.3:** *The caller needs a new tax card for the following year, because of retiring. «I need it now». Kathrine replies that the system for tax cards for next year is not available yet. She explains that they will send out the tax cards in the middle of December, and it will come with a form for changing it. (20111128-14)*

Due to internal procedures, tax cards for the next year are never available as early as November. This caller will have to wait to the middle of December. The next caller wanted information about his income the previous year:

> **Example 5.4.4:** *A caller asks in broken Norwegian what his income was last year, i.e. 2011 (This is in the beginning of 2012). Mari answers «We have not received this information yet». After the call, she comments that perhaps he plans to apply to NAV for benefits. (20120118-7)*

The caller believes the tax authorities have acquired updated information about his income already in January for the previous year. However, information about citizens' income is not collected and available in the tax authorities' databases this early. Understanding the procedures for data collection and knowing the contents of the different databases of the tax authorities involves some understanding of the internal structures, in this case the socio-material arrangements for data collection.

It is mandatory to send a notification of address to the Population Register when moving house. The tax authorities pick up this new address automatically so that a separate notification of address will not be necessary. For students and others who move house often this can lead to confusion about which address is the official one. Students are also encouraged to use their parents' home address, even though this address may be in another part of the country from where they actually live. There are special regulations about addresses for weekly commuters.

The official address in the Population Register is the one used by the tax authorities for letters to citizens. If this address is not updated by a citizen after moving, letters from the tax authorities might not reach them, which may have serious implications for this person. The responsibility for sending the notification of address rests solely with the citizen. If a citizen

reports a move to the post office it will not reach the tax authorities. Understanding this will require some kind of "system understanding" that goes beyond trust in automation.

There are some cases where a caller wants to discuss a particular case with a case handler, but the case has not been assigned to a case handler yet. Assigning a case handler may take weeks (or months in rare cases). In such situations the phone advisor cannot provide much help as nothing has happened regarding the case and advisors are instructed not to do case handling. Certain examples have been reported in the media where an error in the income data reported by an employer, resulted in a very large bill to an innocent citizen. The citizen found out what had happened, and contacted the employer who subsequently corrected and resubmitted their income report to the tax authorities. However, when this citizen called SOL about the huge bill he could not afford to pay, the advisor agreed that it was an obvious error, but could not help because of the division of work and authority within the tax authorities. This particular case triggered special arrangements to be made so that a citizen can be helped in such cases were no case handler has yet been assigned.

Issues related to internal structures can be summed up in Table 7.

Geographical structures	Of little consequence, the citizen may be confused.
Organisational structures	SOL cannot solve or redirect the caller's request. The citizen will need to make at least one more phone call about his request.
Internal socio-material arrangements	SOL cannot solve the caller's request at the time of the call. The citizen will need to make at least one more phone call about his request at a later point in time.
Internal division of work and authority	Some citizens cannot be helped at the time of the call. The citizen must wait for the result of case handling or call again later.

Table 7: Issues related to a need to understand internal structures.
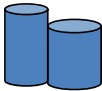
5.5 Technical issues and anomalies

Both in the daily operation of the systems and in more profound ways, technical errors occur – both for the tax authorities and for citizens. The online services may be out of operation temporarily, and the private equipment of the citizens may not function properly. Irregularities in technical operations can be confusing for citizens who perhaps have a vague prior understanding of the tax rules and regulations. The advisors experience that technical errors do happen. One caller said that he could not find himself on the assessment roll, and neither could the advisor. The caller was in a child custody case, and thought this was the explanation. The advisor said that there had been a technical error that resulted in 2000 citizens not having received their tax assessment, but he could not find out if the caller was among them. This caller mistook circumstances that possibly originated in a technical anomaly with his personal case. There are many technical quirks where the advisor cannot find any explanation, but she can still help the caller, as in the next example:

Example 5.5.1: The caller has received the electronic pre-completed tax return form and the spouse had received the paper version. Neither of their cars is pre-entered there, but last year they were. Marianne says "Find the cars on the web pages and fill in the values in the tax return form". She cannot explain why the cars are not listed, but she has seen this occur in some other cases as well this year. (20110427-23)

This technical quirk could be solved by manually listing the cars in the tax return form. This issue had a very simple solution; however, it is interesting to note that errors occur without any warning or explanation from the tax authorities. For some errors, the advisor suggests a workaround, as in the next example.

Example 5.5.2: The caller says "it concerns field 4.8.2 on the form, it needs to be added in the online tax return form". Kåre explains that he must create it himself in Altinn by choosing it from a drop-down list. The caller has tried but cannot find it. Kåre can find item 4.8.3, "is this it?" Kåre logs on to his own personal Altinn tax return form, and even he cannot find item 4.8.2 in the drop-down list. Kåre suggests that the caller uses item 4.8.1 instead and explain why in the comment field. He asks for the telephone number of the caller so that he can look into it and call him back. After the call, he looks closer into the matter, but still he cannot find any explanation for why item 4.8.2 was not visible in the Altinn form. (20110429-31)

To investigate the caller's claim that item 4.8.3 is not available, Kåre must log in to his personal tax return form. He observes the same error there, but cannot find any explanation or correct the error. Instead, he suggests a workaround. A technical error is suspected also in Example 5.3.2 in a previous section where a caller had tried to change her tax card online but found no trace of changes that had been done.

Errors can be difficult to distinguish from certain intentional technical features. In the next example, an inbuilt security feature may look like an error to the citizen:

Example 5.5.3: The next caller opens with saying that he «calls for an exemption card for my daughter. She is 18 years old and a school pupil". Marianne looks her up in the Population Register from the information the father gives because he cannot remember his daughter's National Identification Number. Then Marianne looks up her tax card, and changes it directly to an exemption card. It will be sent automatically to her. The caller explains that he has previously sent an sms to the Tax Administration as the web page describes, without receiving a tax card. Marianne replies that sms does not work when she has previously received an ordinary tax *card, which she can see from the database. For privacy and security reasons, the sender of the sms does not receive any feedback. (20100427-11).*

What happened was not a technical error, but the effects of a privacy and security feature that is built into the process for ordering an exemption card. The Tax Administration will not reply with personal information about previous tax cards in case a third person tries to order it. This is not explicitly mentioned on the web pages, and may look like an error to the citizen. The next example illustrates that the advisor may need to override a default to issue a correct tax card:

Example 5.5.4: "Are there taxes on minimum state pensions?" The caller cannot remember her national identity number, but says her name and birth date. Morten looks her up in the population register, retrieves the national identity number and looks up her tax card. He sees that her tax card specifies a 2% advance tax deduction, but as a minimum state pensioner, she is eligible to an exemption card. Morten explains that only 85% of the minimum standard deduction is included in the calculations determining the tax card. He makes some changes and issues a new one. Morten calls this "stupid mathematics". (20120111-18)

The advisor explained a measurement that makes sure that the agency does not issue a tax card that will lead to underpaid tax and a bill the next year. Many of the phone calls are about overriding defaults of varying kinds. The address registered in the Population Register is the default address for sending the Tax Card, but needs to be overruled in some situations, as the following example shows:

Example 5.5.5: The caller needs a tax card, and Nils explains how he can order it by sms. It emerges that the caller lives at a different address than the one listed in the population register, and Nils enters the Advance Tax System to register a temporary address. Then he issues a new tax card for the caller. (20111205-11)

A tax card ordered by sms will be sent to the default address, and sms could therefore not be used in this example. Many students and other citizens who often move house cannot rely on their population register address being updated. Understanding what is updated automatically and what the citizens need to do themselves can be difficult, as the following telephone call illustrates:

Example 5.5.6: The next call is about the tax card. "There's a lot I wonder about" the caller says, and explains that according to her tax card 15% tax is deducted. "I thought I was a non-taxpayer". Berit looks her up in the Advance Tax System, and says that an income is registered there. The caller complains that this is out of date. Berit goes through the data with her, and she remembers other sources of income. Berit mentions particular figures she can see, and the caller avoids answering. She asks instead "Will tax matters affect my age pension?" Berit replies "Please concentrate on your tax card for next year so that it will be correct from January", and tells her to correct the figures she finds incorrect. The caller complains how difficult this is, and is surprised the tax authorities do not have better figures in their database. "What about people who find it difficult to call and who do nothing?" she complains, and Berit replies "Then you keep track of yourself". They talk about a one-off income from last year, which is repeated also for this year. Berit explains "The machine thinks that a one-off payment will be repeated every year" and the caller comments, "No, there you can see how bad it gets". Berit ends the call by saying that "No, it is up to each and every one to check it themselves. It is their responsibility." After the call, she sends the caller a paper form for changing the tax card. She comments to me that she hopes the caller manages to fill it out. (20111219-13)

This call illustrates that the division of labour between the tax authorities' data collecting that seems to occur automatically from the citizens' perspective, and citizens' manual data updating is not clear. Many believe that the automatic collection of data covers more than it

actually does. This caller blamed the tax authorities when she had not updated the databases herself. The automatic collection of data will pick up a change in income the second year after it happened. This caller complaints about the accuracy of the figures in the database, and she seems to be unaware of the one year delay before these figures are updated automatically. The citizen will need to update the database manually if she wants a faster change.

To be able to take full responsibility for updated background information for the production of the tax card, the citizen will need to relate to how the automatic updating processes of the tax authorities are done. Some data is still not reported automatically. At the same time, the citizens are ultimately responsible for the information in the registers and the tax authorities' databases.

Both technical errors and intended features that the citizen is not aware of will lead to unexpected results for the citizens. The challenges connected with technical issues are summarized in Table 8.

Technical errors:	
Missing data in the pre-completed version	Report manually
Missing functionality	Advisor suggests a workaround
Intended features:	
Security and privacy measurements	The advisor explains and provides help
Built-in defaults	The advisor can override
Databases not updated	The citizen will need to update manually, or in some cases wait for a later automatic update

Table 8: Challenges related to technical issues can be categorised as errors, intended features and updating databases.

5.6 Manual tasks and documentation

The citizen with a relatively ordinary economy has little need to provide documentation of income or deductions from taxable income as the tax authorities collect this information from employers, banks and others. An income deduction stemming from paying interest on loans will already be reported to the tax authorities by the financial institution, and the standard tax allowance will be calculated automatically by the tax authorities. However, in some situations it is possible to deduct other expenses. For instance, loans between private will need to manually reported. It is the responsibility of the citizen to provide documentation for such claims, and the tax authorities will have no prior information about this. This responsibility rests solely on the citizen, who has little experience with the requirement for documenting claims for tax deductions. The next example illustrates that some tax allowance claims on the basis of illness will not be valid unless they are documented with receipts or a statement from a physician:

Example 5.6.1: The caller asks if diabetes type 1 will give the special tax allowance. Nils answers that this does not happen automatically anymore. He tells her to get a doctor's certificate that her diet is regulated, and specify and show that the expenses are probable. He adds that undocumented special tax allowance for diabetes was terminated 4-5 years ago. He adds that it is ok to forward the doctor's certificate if she already has submitted the tax return form. (20100428-19)

In addition to explaining the rules for the special tax allowance related to diabetes, the advisor also suggests a way for the caller to proceed. There are other claims that do not require documentation because the claim is substantiated by information already in the databases. The standard deduction from foreign employees working in Norway does not require documentation, but must be claimed explicitly from the citizen in the tax return form.

Example 5.6.2: A Swedish-speaking caller says that she does not understand how she deducts the 10% standard deduction for foreign workers. She cannot find the item in the tax return form. The advisor explains that she will need to write a textual claim. (20100428-20)

There is no box to tick for claiming this deduction. The citizen will need to state the claim in the additional information field.

Much personal data is gathered automatically. Example 5.5.6 in the previous section illustrates that the division of labour between the tax authorities and the citizen can be difficult to understand. In the tax return form, the citizen will need to document information that is not reported automatically. This is not straightforward, and in the next example, we can see that this can lead to other complications as well.

Example 5.6.3: A mother calls for her daughter who has outstanding tax payments. The mother explains that the daughter has lodged a complaint about the taxation. Since the daughter received a bill with half the outstanding amount, they thought that the complaint had resulted in the bill being divided in half. Then she received another bill, which she could not afford. She had to take up a loan to pay the first bill. The daughter has moved away from her parents; and the mother provides the new address, which is different from the one listed in the population register. She provides another address, which is still not the same as listed. Per checks the databases that a complaint has been received, and finds that it has been entered online. He can see that it is something strange about the complaint registration, but he does not tell the mother. The mother says that case handling of complaints is too slow. Per says that it is important with an updated address so that letters from the tax authorities will be received if they ask for more information during the complaint case handling. In addition, he asks the mother how the daughter had documented her claims. The mother explains about a claimed allowance for commuting, and that the daughter became sick. Per does not tell the mother which address is listed, and says "I cannot tell you everything". He ends the call by telling the mother to tell her daughter to check her registered address and that she has provided proper documentation for her claims. (20111010-2)

Per needs to disentangle the situation described by the mother. He can see that the daughter's complaint has not been filed properly, but he cannot tell the mother personal information about the daughter who is of full legal age. This makes it harder for him to help

the caller and her daughter. Costs that stem from keeping two households because of commuting are deductible. However, these costs are only deductible as long as the commuting takes place. These deductions can be integrated in the tax card. If the taxpayer becomes sick, stays at home, and does not commute, the costs for double housing are not automatically deductible. Special documentation that the extra costs are necessary even though the taxpayer does not commute for a period will be needed. Per does not reveal all the details he can see to the mother, but he suggests some steps for her to take towards a solution. The tax authorities have no source for receiving such information. If the citizen does not provide documentation, he or she will receive a bill for underpaid tax the following year, and this is what happened to the caller's daughter. Some kind of "system understanding" about what type of information is reported automatically, and from whom, will help the citizen to understand that some claims need documentation while others do not. This requires a certain amount of "system understanding" by the citizen. Trusting blindly in the automated system is not to their advantage.

Before the pre-completed form was introduced, the citizens had to fill in most figures in the tax return form themselves. Many citizens have little or no experience in how to find and calculate these figures, as illustrated in the following example:

> *Example 5.6.4:* *The caller says that she is filling in the tax return form online right now. She calls about the value of her car. Berit looks up the standard price table for cars etc. and replies that 30% of the original price is used. The caller says "Thank you!" and hangs up. (20100430-2)*

Citizens who have bought a new car will not necessarily find it listed in the pre-completed tax return form and the citizen will need to provide the value herself. The standard price table is available online. This manual task is not complicated, as in the previous example, and does not need further documentation, but this is enough to trigger a phone call from a citizen who is not used to looking up such data for herself. The manual tasks are a diverse group of issues. A summary of the issues is given in Table 9.

Deductions and claims need documentation	The citizens are not used to document their claims.
Deductions need to be explicitly claimed	Citizens need to understand and find the right box to tick (shape sorting issues)
Missing documentation	Can lead to halted case handling and unexpected results
Figures are not pre-completed	Citizens will need to look up the values and fill them in

Table 9: Issues when citizens need to do manual tasks such as special allowances or claims.

5.7 Laws and regulations

The laws and regulations are in themselves a source of problems for many callers. Often they are difficult to discern from "shape-sorting" issues, and general problems with how to fill out the form, but some callers ask explicitly about the rules. In some cases the advisor can easily explain how the rules will be applied. In other cases the advisor cannot give a straightforward interpretation of how the rules will be applied in the caller's situation. The first example involves the advisor explaining the rules to a caller who asks how she should report the sale of two flats where one is rented.

> *Example 5.7.1: The caller says that she will sell an apartment. "How should I calculate? What should I pay in taxes?" She explains that she owns two apartments, and will sell both. One is rented. "Can I read about this online?" Yousef shows her that under the tab "useful links", she can read about selling property, and she comments on the information there. Yousef explains briefly what she has to do: deduct everything, including costs for buying and selling, subtract this and pay 28% tax from the difference. She asks "What about costs for laying tiles? And repairs?" and Yousef explains, "You have already deducted these in the assessment of housing property". She asks, "What if the children live there?" Yousef answers all her questions until she is satisfied. (20111121-13)*

Yousef gave this caller a brief introduction to the rules for taxation of rented property. There are also calls where the advisor has no clear answer to how the rules will be interpreted. In the following example the advisor suggests how the caller can address a grey zone in the rules:

> *Example 5.7.2: The caller is commuting; he lives in Sweden and works in Oslo. "Can I deduct for commuting before I married and moved house formally? I lived in Sweden while building the house where I now live". Per replies "Have a try" and "write a question [on the tax return form] asking if the deduction is acceptable even before marriage". The caller cannot find the standard amount for the deduction in the guidelines, and Per says that it is 189 NOK per day when absent from home. Per finds it under item 3.2.7 in the guidelines. (20110429-18)*

Instead of giving a clear answer to how the tax rules will be applied, the advisor provided a recipe on how to proceed when in doubt. The advisors know most rules and regulations by heart; however, questions concerning stocks and the tax agreements with other countries are seen as difficult. In the next example a caller suspects that her stock values are not calculated correctly in her tax assessment:

> *Example 5.7.3: The caller is in doubt whether her outstanding tax has been calculated correctly. She has made her own tables with RISK[26] values for her stocks. Some appear to be*

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[26] RISK is an acronym for "Regulering av inngangsverdi med skattlagt kapital" in Norwegian. It is a calculated value used for taxation when selling stocks.

*correct in her tax assessment, whereas others are not. Yousef is not willing to make
calculations and give an opinion over the phone, so he tells her to lodge a complaint even
though the deadline has passed, so that the stock values will be calculated a second time. The
caller seems surprised, but says she will do so. (20111205-20)*

Yousef does not want to check the figures on the phone, but instead he gives the caller advice on how to request a second calculation by a case handler. Lodging a complaint in order to force a second assessment is new to the caller. Advisors should not do case handling on the phone but refer personal cases to a case handler for proper treatment.

The role of SOL is to give advice, which is different from dealing with individual cases. Queries the advisor cannot answer, and which do not require individual case handling, will be logged to second-level support where an expert on that particular topic will reply to the caller within 24 hours. The advisor could not answer the question in the following example, so he logged it to second-level support:

> **Example 5.7.4:** *The caller presents herself and says that she is currently "in the business of
> selling land". Does selling plots of land count as capital income, personal income or income
> from self-employment? She explains that many years ago she bought a small farm to live
> there. Now the area has been regulated for development, water and sewage have been
> installed by the municipality and she has received a bill for 2 million kroner which she cannot
> afford without selling land. She is living on a disability pension, and she risks losing this
> pension if income from selling land is counted as anything other than capital income, which
> does not influence the disability pension. She states specifically that the process was started
> by the municipality, and she says she is forced to sell land to afford the bill. Per is not sure if
> there is a limit on how many plots of land you can sell before it is counted as personal income.
> He looks up the LigningsABC without finding anything. He logs the call to second-level
> support, and formulates a description of the issue together with the caller. He enters her
> mobile phone number so that second-level support can call back to her. (20111010-5)*

Per has no knowledge about how the caller's disability pension will change as a result of this income, nor can he influence this; he only checks what the tax rules says about selling plots of land. How this caller's economic situation will develop is outside the scope of the tax authorities alone as it is also depends on how the municipality and NAV (the welfare office) proceeds. This example is discussed in more detail in Paper 1 where we analyse it as a possible example of both a complicated life situation for the citizen and complicated tax rules where there is no clear answer. Attempts from the advisor to disentangle the situation by checking how the income can be "shape sorted" in the system could reveal other entanglements as well.

Challenges related to laws and regulations are summed up in Table 10.

Applying rules to one's own situation	The advisor explains the rules applied to the personal situation
	The advisor suggests a way to proceed in case of doubt
	The advisor directs the call to second-level support
	The advisor explains how to request case handling to settle the case.

Table 10: Summing up issues related to Tax laws and regulations.

5.8 Making things more complicated

The examples in the previous sections illustrate how things can become difficult in the relation between the citizen and the tax authorities. I have depicted the challenges as lying on an axis between the citizen and the Norwegian laws and regulations, where problems and issues may also arise at both ends. However, this is only part of the picture of what makes doing taxes difficult for citizens. In some telephone calls, the advisor cannot help the citizen directly because of conditions or events outside of the tax authorities. Many telephone calls describe that problems arise because of interaction between municipalities and private and public agencies. In Figure 22 the axis is extended to incorporate municipalities, employers and other public agencies.
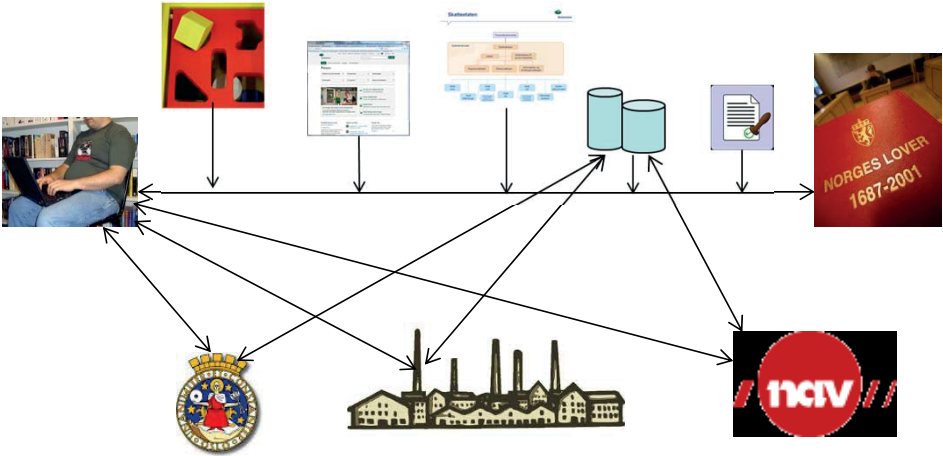

Figure 22: Direct interactions between the tax authorities and private employers and other public agencies may make the situation more complicated for the citizen, as well as actions taken by municipalities.

Private employers report salary and other personal data electronically to the tax authorities. Other public agencies exchange personal data directly between their computer systems and the tax authorities' computers. Private employers make errors that have consequences for the citizen, and the interaction between public agencies can make a situation less transparent. For example, municipalities may report costs for childcare, and may interfere in assessing the value of properties. Actions taken by local municipalities may also influence the taxation situation of a citizen in a non-obvious way, such as in Example 5.7.4 above. In the following,

I will give some examples of interactions between the citizen, the tax authorities and others influencing individual tax issues.

5.8.1 Employers and other private enterprises

Quite a few telephone calls are about the caller's relationship with their employer, who may, for instance, have withheld too much tax from salary payments. In such cases, the advisor cannot help directly but will tell the caller to contact the employer.

> **Example 5.8.1.1:** *A man opens by saying that he calls for a young woman. He is cohabiting with her mother, and he says that he calls concerning the young woman's employer. They have withheld too much tax in January. They have withheld 50% because she had not given them her tax card. Kari explains that in January the tax card from last year can be used. She says that the employer has made an error, and that they must settle the tax that had been withheld. She tells the caller that his stepdaughter must talk with her employer and ask them to correct it. (20120118-16)*

The advisor has no influence over the employer and can only give advice. In case the young woman in question does not succeed in talking with her employer, she will receive the extra advance tax paid at the next tax settlement more than one and a half years into the future. Such errors made by employers will directly affect the citizen's economic situation.

Private companies are also responsible for reporting their own stock values. Irregularities will migrate to a citizen's tax return form, and can be the topic of a phone call as illustrated in the next example.

> **Example 5.8.1.2:** *Jan Tore answers the English speaking line. The caller is doing his tax return online right now; his question is about stocks and which form he must use. He explains about redeeming some stocks when the company went bankrupt. He says that the company has not reported the information they should about the stockholders, so these stocks are not in his pre-filled tax return form. Jan Tore looks into the air and pilots the caller through the form based on his memory. He gives the item numbers where the caller needs to enter data, and concludes with "you just click save, and go back to the main menu". He further explains that the last item in the tax return form is 5.0 "additional information" and he advises him to "briefly explain the situation there". He comments to me afterwards that he has heard this story also from some other caller. (20110427-15)*

In this example, the advisor could give sufficient help to the caller as the employer's missing reports only had an effect for the caller's tax return form, but not his economy as in the previous example.

Employers may go bankrupt. After a bankruptcy, there is no one who represents the employer and who can help the citizen in retrieving or reconstructing documentation that the citizen will need to document his claims towards the tax authorities. The relationship to a bankrupt employer may give problems more than two years after the employment ended. In

the next example, a young man has received a bill for both underpaid tax and penalty tax for missing reports. He needs to document his version of what happened, but there is no one to help him as the employer has gone bankrupt:

> *Example 5.8.1.3: A young man is talking. He explains that he has received a bill from the Tax office for 13 000 kroner in underpaid tax. He was assessed for additional tax because his tax return form contained no information about a salary statement ("lønnsoppgave") for one of his incomes in 2009 (This is 2012). The caller explains that his employer went bankrupt, and at the time he received salary payments, some state guarantee payments, and unemployment benefits from NAV. "I understand very little [of this]", the caller says. It is difficult for me to follow his explanations. I can see that Morten looks up his tax return form for that year and a letter from the tax office saying that they do not accept some figures in his tax return form, warning that they will change these figures. Morten asks many questions to understand what had happened, such as "Are the payments reported twice? Perhaps the salary is included in the pay assessments from both the employer and the state guarantee?" The caller cannot remember this far back, and he cannot find the annual pay assessments. He has no paper documentation. Morten looks up and displays on his screen various versions of the caller's tax return form with different figures for the salary. From his tax assessment on the screen, I can read that he has been fined 10 000 kroner, and I understand from what the advisor says that this fine is because he has not reported the income from the employer that went bankrupt.*
>
> *Morten says "Now you need to think: Did I receive a salary from [the employer] as was due? Did I receive a salary or unemployment benefits after the bankruptcy?" The caller repeats that he cannot remember, but he can recall that everything went smoothly at the time. Morten tells him to look in the archives in his online bank and find the incomes he received from his employer before the bankruptcy. He sums up the caller's position to be that "You disagree with the pay assessment from [the employer]" and tells him that he has to lodge a complaint. The caller says that he will look into it and maybe he will call again. He sounds like he will close the call, but Morten replies, "No, you have to lodge a complaint, preferably with a copy of your pay slips". The caller sounds happier now, «I have got many ideas on how to proceed», and he repeats that he will check his online bank account and perhaps contact the lawyer who dealt with the bankruptcy. Morten adds, "Call your local tax collector, and tell them that the outstanding amount may be changed. Perhaps your tax payment may be put on wait until the complaint is settled".*
>
> *He transfers the call to case handling in the region where the caller lives, and registers the call in the internal logs with a comment: "The caller asks for more time to lodge a complaint about the income decision. Perhaps there has been some double reporting".*
>
> *This call lasted 29 minutes. After the call, I asked Morten what he thought. He thinks that the caller had received both salary and guarantee payments: "These young guys, they think we arrange everything because the tax return has been correct previously". We discuss the case and Morten says that he cannot tell what has happened; there are indications for both the caller being right in his claims about the income being doubly reported and the opposite. (20120111-5)*

The caller had received both salary payments from his employer and guarantees payments from the State and had not taken care to archive his wage slip and guarantee documentation. The tax authorities claims that the caller had received double income without reporting, but the caller claims that he only received one income. He believed that the income was reported in the double due to an error from someone other than himself. If the reports from the employer to the tax authorities were incorrect, there will be no one there now to help the caller with correcting the reports. He could not find any documentation of the incomes he received three years earlier, as he was not aware of the need to archive documentation at that time.

It was not at all clear for Morten what had happened, and who was right in their claims. Neither could he specify in detail what the caller should do to help himself. Instead, he disentangled the situation and suggested steps to take to address the problem, a central point being to lodge a formal complaint to the tax authorities for a second assessment and try to find documentation for his claims from his bank.

In the caller's view, the "double income" had not happened. Preparing oneself to document that a claimed event did not happen may be a challenging task. How can you be aware of a situation like this happening? When does a non-event happen? It may be difficult at the time to know that certain documentation will be useful in the future when one is not used to documenting claims. Alternatively, he may try to disentangle and trace the interactions between the employer, the State guarantee fund and the tax authorities to support his claim of double reporting, also a complicated task.

Reporting errors will mostly have consequences for a citizen's pre-completed tax return form, where incorrect figures can be corrected by the citizen. However, as the last example illustrates, some reporting errors may have wide-reaching consequences for the citizen's financial situation because the tax authorities may dispute the claims of the citizen. Challenges for citizens that stem from interactions between the tax authorities and private employers are summed up in Table 11.

The employer deducts too much tax from the salary.	Affects the citizen's economy.
Missing reports from the employer. Missing stock reports from a company.	Affects the citizen's tax return form. The citizen will need to report and possibly provide documentation.
Missing or erroneous reports may have delayed consequences.	The citizen will need to provide documentation of a third party's actions. In the case of bankruptcy, this may be difficult.

Table 11: Summing up issues from interactions between the tax authorities and employers and other private agencies.

5.8.2 Other public agencies

Many citizens with a problematic life situation receive benefits from the national welfare agency, NAV. Nina, who works in SOL's management, says that "often it is not only us [the callers] have trouble with, there are other problems as well so that you have a whole package [ ] that is difficult." The threesome of NAV, the tax authorities and the citizen can lead to problematic situations as illustrated in the following example:

> *Example 5.8.2.1: This call comes from a social worker in a municipality. The social worker says she is "sitting with a guy who receives a work assessment allowance from NAV". NAV has deducted 50% tax, and then there is not enough of his benefit left to live on. Marianne thinks that this happens now because NAV is "tidying up their systems" and cannot find his tax card. The caller gives the name and national identity number of her client, and Marianne looks him up in the Advance Tax system. The social worker gives figures for his benefits and other details, and Marianne enters them directly into the advance tax system. The taxpayer, the caller's client, will receive the tax card in the mail c/o the municipal social worker. NAV will receive a new tax card electronically. (20100428-4)*

Nina explains that to give good advice on the phone the advisor needs to know something about what the other public agencies are doing, and this is a complicated task as it varies from agency to agency, region to region or between the municipalities. Internal organisation and practices of the other public agencies vary significantly. The Directorate of Taxes and NAV have agreements as to how NAV will deal with tax cards handed in by the clients, but what happens in practice varies between the different NAV entities. Different internal practices in NAV can have tax-related consequences for the client, and in particular errors can lead to an undesirable economic situation for their client.

Less serious issues can also come about because of interactions with other public agencies. The PIN-codes needed to log in are administered by another public agency: the Agency for Public Management and eGovernment (Difi). The PIN-codes are a recurrent topic. Issues with logging in can lead to a telephone call such as in the next example:

> *Example 5.8.2.2: The caller has a question about logging in with the PIN-codes. Berit gives the telephone number to user support in Difi. (20100430-14)*

A request for new PIN-codes goes to Difi. A citizen who needs both a new tax card and new PIN-codes may need to contact two agencies. The next example illustrates that this can cause delays:

> *Example 5.8.2.3: The caller says that he calls from [a city]. He speaks with a heavy accent. He explains that his wife has changed her telephone number, and the PIN-codes for logging in are not working any more. New PIN-codes will arrive in the mail, but this might take some time. Berit explains that his wife can order a tax card by sms without using PIN-codes. (20101108-18)*

The PIN-codes can be coupled to a telephone number, such that a code for logging in is sent by sms. When the citizen changes her telephone number, it will take some time to make a coupling with the new number. This coupling is administered by Difi. The caller's wife needed a new tax card and could not wait. Berit suggests bypassing the PIN-codes and using another method for ordering a tax card – by sms from the new telephone number. This sms does not involve another agency, but goes directly to the tax authorities. However, as illustrated in Example 5.5.3 there may be some restrictions on the eligibility of some citizens to order a tax card by sms.

Changing the tax card online implies logging in to a form hosted by the tax authorities. Changing the tax return form online implies logging in to the Altinn portal. The login is hosted by Difi. A citizen might very well not be aware that these are different server hosts. The responsibility for the online services may be unclear for a citizen. If things go well, this creates no problems.

The last phone call in this section is an unusual example where incidents that involve other agencies may also influence the relationship between a citizen and the tax authorities:

> **Example 5.8.2.4:** *The caller opens by complaining about the waiting time on the line, and she continues "Neither my husband nor I have received our tax cards this year". Morten checks it up and says "It seems as both of you have received the tax card in the mail". The caller is one hundred per cent sure that she has not received any tax card in the mail. Then Morten remembers something he has read in the news: "But a mail van was involved in a fire in your area earlier this year". Her tax card could have been in this van. Morten issues a copy of the two tax cards. (20120111-22)*

The advisor could of course not know for sure if the caller's tax card was in this van, but neither could he exclude it. His databases gave no information, and he offered no other explanation. The issues that arise with interactions with other public agencies are summed up in Table 12.

NAV withholds too much from a client's benefits without explanation.	The reason may be that the citizen will need to provide a new tax card.
Difi administers the PIN-codes.	Delays may occur in the communication between the citizen and the tax authorities.
A burning mail van may contain letters from the tax authorities.	The communication between a citizen and the tax authorities may be disrupted by very rare incidents involving third parties.

Table 12: Issues from interactions with other public agencies.

5.8.3 Municipalities

The municipality reports personal data that goes into the pre-completed tax return form for a citizen, as well as other activities that will influence certain tax issues. For instance, citizens' costs for childcare are reported from the municipalities to the tax authorities. In Example 5.7.4 above, we saw that when the municipality was building infrastructure for water and sewage it had some consequences for the welfare benefits of the caller who had to sell plots of land. The municipalities also administer the roads and addresses in their geographical area. The next example illustrates that when the municipality changes the address of a house it can have some consequences for the relation between the citizen and the tax authorities:

> **Example 5.8.3.1:** *The caller explains that the tax card has not arrived in the mail, neither for his spouse. The place where they live has changed its address, and the caller wonders if this has anything to do with the missing tax cards, and Mari agrees. She temporarily changes the old address in the advance tax database and issues a copy of the tax cards. She looks up the population register and finds that the old address is listed there as the mail address. She finds this odd, and will take a print and give to those colleagues who maintain the population register. When looking closer, she can also see that the tax cards have been sent in the mail from the tax authorities, but are returned as undeliverable. (20120118-20)*

The citizen at this address was not aware that her address in the population register needed to be changed, as she had not moved house. However, the consequence was that she did not receive the letter from the tax authorities with the tax card.

The tax collector is a municipal unit. The tax collector handles all tax payments and refunds of excess tax. The citizens can change the bank account for receiving excess tax refunds online in Altinn or by contacting the tax collector directly. However, it they do so, the information only goes to the tax collector. The new bank account will not be visible to the central tax authorities, who will only be aware of the bank account given in the tax return form. If a citizen calls SOL and asks which bank account is used for the refund, the advisor cannot answer, as he does not know whether the caller has changed it online. They tell the citizen to call the tax collector in his or her municipality or log in and see for herself.

Some issues with the interaction between the tax authorities and the municipalities are summarised in Table 13.

The municipality regulates addresses.	Affects the citizen's address, may not receive letters from the tax authorities.
Building infrastructure, inducing costs or changes in property value	Affects the citizen's tax return form. Potentially wide-reaching consequences for citizens' economy.
Reporting similar to other public agencies	Affects the citizen's tax return form.

Table 13: Issues concerning the interaction between the tax authorities and the municipalities.

5.9 Other kinds of requests

Some calls cannot be placed on the axis above in an obvious way. Some of these calls concern matters outside of the problem field discussed above, others relate to many of them - with no single issue dominating. Some citizens call and ask for something that is not available at all – neither online nor in the paper forms. The next example is a call from a woman who did not express as much trust in the tax authorities as many others.

> **Example 5.9.1:** *A woman calls and says that she has recently submitted the tax return form without any changes from the pre-completed one. She has no printer, and how will she get a printout? Berit says that she will send her a paper copy of the tax return form in the mail, and adds that the caller does not need to submit if she made no changes. The caller then explains that she is an accountant and that she wants confirmation that she has submitted the tax return form. She wants to save this receipt on her PC. She does not need a paper copy of the tax return form as she already has one. She wants to save the receipt together with the tax return form as a pdf file on her PC, because the data in the tax return form is not available in the receipt – but this is not possible, Berit tells her. (20100430-1)*

This caller wanted documentation *that* she had submitted the tax return form together with documentation of *what* the form looked like when she submitted it. She did not find the receipt issued automatically to be adequate. Perhaps she was preparing for a controversy with the tax authorities, and wanted proper documentation on her side. However, the tax authorities cannot provide such a receipt, neither electronically nor on paper.

Some calls are not about problems, but more about exploring a possibility space. One caller was offered a job with a lower salary than her current job, and she wanted to simulate her future income when taxes were taken into account:

> **Example 5.9.2:** *The caller considers accepting a job offer where the salary is 50 000 kroner lower than in her current position. Berit tells her "Since you have a table-based card the decrease will make no difference". "OK, can you tell me what this means….". They talk about the table-based tax card for a while and then the caller asks, "What is the income cap for surtax?" Berit leafs through some laminated papers to her right and finds the cap for 2012. She tells the caller that it is 490.000 kroner with additional 9% taxes above this income cap. (20111219-11)*

This caller was using the information from the advisor as a background to the decision whether to accept the new job offer. If the surtax cap was taken into account, the difference after taxation between her current salary and the one offered might be less than the difference between the two salaries. The job offer may look more favourable. It was not so much a problem that triggered the call, more assessing the new possibilities. Others call and ask for information about how they can lower their taxes, e.g. whether they can distribute their income over two consecutive years to decrease overall taxation. These examples are about collecting information for planning and decision making for personal autonomy, more than about a problem.

It is important to keep in mind that citizens also contacted the tax authorities about their tax issues even before the high degree of automation and computerization was introduced. Many of the questions are general questions about tax, which a citizen will need to learn some way

or another – if not elsewhere then from asking the tax authorities. Berit, an experienced advisor who has worked for many years in various positions in the tax authorities, told me that in the old days when she was working at a municipal tax office, some elderly ladies arrived with a thermos flask with coffee and sat there knitting while waiting at the tax office for someone who could help them fill in the tax return form. "Perhaps those who became widowed for example, and were used to the husband sorting out all paper affairs… they knew nothing, not even where the papers were and what they owned". These old ladies could not find out about doing taxes all by themselves.

Some of these problems are still the same, as all citizens to some degree will need to address their tax issues explicitly once in a while. Some issues are solved by the automation that has taken place, however, automation has introduced some new issues. I will come back to this in a later section.

5.9.1 Unproblematic calls

The analysis above focuses on extracting problems from the calls. For this analysis, I have deliberately chosen the calls that illustrated some kind of problem; however, many calls are fairly straightforward. Anders from the SOL management complained that many citizens call for a confirmation that they do not need to submit their tax return form, and added, "After all, we're trying to teach a whole nation!"

Many kinds of telephone calls to the tax authorities are routed through SOL, so that an ordinary call from a citizen to a case handler will first be answered by the tax advisors at SOL. In addition, there are some services that are not available online. At the time I did my fieldwork, citizens had to call SOL if they needed a copy of the tax return form; there was no online service if the citizen had changed the pre-completed paper form. Some citizens were not aware that they could use online services for e.g. ordering a tax card, and sounded happy about this possibility for do-it-yourself autonomy. The analysis above is not in any way an evaluation of the work of SOL in advising the callers, or an evaluation of how the tax authorities can reduce the number of calls.

5.9.2 Different responses to similar requests

The tax card is the topic of many calls at all times of the year. The tax card specifies how tax is deducted from a salary during the year, and directly influences the citizen's financial situation. An erroneous tax card can cause unnecessary financial difficulties for the holder until the tax assessment is done next year and excess tax is repaid. However, it is not illegal to make an incorrect estimate of income when ordering a tax card, so this is an area where the citizen can have some direct influence on their tax situation.

At the time of the field work, tax cards were issued by the tax authorities and sent in the mail to the citizen, who had to give the tax card to his or her employer. It could take some days before a new tax card was produced and received. (As of 2014, tax cards are produced by the tax authorities as previously and made available online to employers). In the next chapter I will show that this may introduce some new tasks for the caller.

Quite a few calls to SOL are from callers who need their tax card as fast as possible, preferably today, to avoid their employer deducting 50% of a salary payment. Some advisors provided various workarounds in this situation. Morten, for instance, was willing to help by changing the tax card directly in such cases. While talking with the caller he entered new

figures into the advance tax register and issued a new tax card. If the caller did not have the time to wait for the new card to arrive in the mail, Morten told the caller which percentage was calculated, and said that the caller could tell his or her employer to call SOL and ask for confirmation. This would be sufficient for an employer to make correct tax deductions, and a satisfactory arrangement until the tax card arrived in the mail. However, this workaround was not used by all advisors. The next call is an example where the advisor did not help by providing a workaround in this situation.

> *Example 5.9.2.1:* *The caller says that she has changed her tax card because she will begin unpaid parental leave. Two weeks previously, she had gone in person to the tax office in Larvik, but has not yet received the card. Torild logs into the advance tax database and can see no trace of any new figures having been entered recently. The caller says that the employer will prepare the salary payment in a few days, and too much tax will be deducted from her last salary payment unless she can hand in a new tax card immediately. Torild says that she cannot help, and the caller sounds disappointed before she closes the call. (20120208-12)*

The withholding of tax is based on the annual income. When this caller embarks on unpaid leave for some months, the estimated monthly deductions will be too high. To issue a correct tax card deductions for tax will need to be averaged for the whole year, and lowered for those months where she receives a salary. The caller in this example had tried to improve her economic situation by changing her tax card so that less tax will be deducted from her last monthly salary. She went in person to change her tax card. Perhaps there were large delays, or the office in Larvik made a mistake in registering the request for a new tax card. In both cases, the caller's financial situation will be affected by too much tax being deducted from her last salary before unpaid leave begins. Torild is a relatively new advisor, while Morten is more experienced. I could not understand whether Torild was following the rules very strictly, or whether she was not aware of the workaround described above. This example shows that the attitudes, experience and actions of the advisor will have direct implications for the autonomy of the caller.

Providing a workaround may be part of disentangling an issue, as in this example. Even if the advisor suggests a workaround there will still be steps for the caller and her employer to take so that her economic situation will be the best possible in the situation. In many phone calls, citizens express a need but cannot describe or suggest a working solution, such as in the next couple of examples, where advisors differ in how active they are in disentangling the situation for the caller. Paper distribution of tax cards has now been replaced by digital distribution, but the next couple of examples address a topic that exists regardless of how the tax cards are distributed.

The routines specify that there are some services the SOL advisors cannot provide even when a citizen explicitly asks. The advisors have to negotiate the callers' requests with these routines, which have to be interpreted in each call (similar to findings in Muller 1999; Whalen et al. 2002; Maass and Rommes 2007; Martin et al. 2007; Svensson 2012). The result may be that different advisors treat similar-sounding requests differently. However, requests are seldom exactly the same; there may be differences in the circumstances, for example depending on the time of the year. One of these is increasing the advance tax percentage. The

following example illustrates that even though the citizen in question could benefit from some extra service, the advisor followed the rules strictly:

> **Example 5.9.2.2:** *A young man, Tom, has recently received his tax card [in the annual general distribution]. The caller presents herself as his mother and his trustee ("hjelpeverge"). He is 18 years old, and has a percentage-based tax card, the mother explains. The mother wants the percentage to be increased a little from the current 2%, just to be sure. In case Tom "gets himself a little job", it will be practical if the tax card was ready. Berit asks: "He has a pension, is it a disability pension?" and the mother answers "yes". Berit continues "If you want to increase the tax percentage you must send a written request to NAV"", "ok, so you cannot give me a new tax card?", the mother asks. Berit replies that to issue a new tax card she "has to correct the figures" and the mother says disappointed "So, you cannot merely change the percentage, accordingly? " Berit gives some practical advice on how to manage the income figures, and the mother closes the call by saying angrily "Gosh. Oh my God!" (20111219-3)*

The employer is required by law to increase the advance tax percentage if the employee asks. This information is not (easily) available on the agency's webpages, and Berit does not mention that there is legal authority for this request. The mother of a son who receives a disability pension might know that he will need some extra buffers against underpaying tax, and wants to handle this as easy as possible on the phone. She might have previous experiences with NAV that leads her to want to contact the tax authorities. Writing a letter to NAV, without knowing there is legal authority for the request, may seem like too much. However, a quite similar, but not exactly the same, request is answered differently by another advisor:

> **Example 5.9.2.3:** *The caller thinks that her tax percentage is too low. She has only 16%. Marianne asks "Are you a single parent?» The caller is not, and Marianne proceeds by asking her about her salary data and offers to increase the percentage. Her first calculations give 20%. She calculates a little more and they agree on 20%. Marianne changes the income data in the database, and issues a new card that will be printed and sent from the Directorate of Taxes. (20110427-21)*

Why did Marianne help with increasing the percentage while Berit did not, even when there can be good reasons for giving extra help to a mother with a disabled son? There is half a year between the two telephone calls; the last one took place earlier the same year. The time difference could play a role as the routines could have been tightened up, but I think the main reason was that the requests were formulated differently. Berit has on other occasions shown concern for sticking to the routines, and offered support for do-it-yourself autonomy when the caller requested duke autonomy support. While the first caller only wanted an increased percentage, the second caller opened up for reconsidering her income data as well as her percentage; at least when prompted by Marianne, who actively disentangled the situation for her by asking questions that made her able to make new choices. This allowed Marianne to change the caller's income, which will be necessary for calculating a new percentage. However, for the mother of the young man, asking about "increasing the percentage" would possibly be no different from "increasing the income figure" as long as this is what the tax authorities require. Formulating the request precisely amounts to finding the right slot in the

"shape sorter". Increasing her son's income could have been a workaround for her, even though she did not request this.

These callers received different responses because of how they formulated their very similar-looking requests. However, these differences are very subtle and citizens cannot be expected to know such things. This situation has a parallel in medicine: a patient who diagnoses herself and merely tells the doctor to issue a particular prescription drug, risks receiving a more narrow examination than the patient who asks the doctor a more open question and describes the symptoms.

The two phone calls illustrate that the autonomy of the caller, here in the form of a suitable tax card that fits the caller's economic situation and needs, will be influenced by many factors. Here we have seen the following factors playing a role: how the question is formulated, the advisor's willingness to reach out and disentangle the situation of the caller, strictness in following the routines, the advisor's willingness to provide support for duke autonomy, and how the advisor interprets the request and responds.

5.10 The advisor's strategies

Many advisors show concern for the caller, and they mention that they need to "meet people where they are" and that being patient is important in this job. Per expressed that he wants the callers to feel secure about their tax issue after the call. However, helping people to help themselves is considered by the advisor to be an important goal. The first decision the advisor needs to make at the start of a call is whether this is their goal for this caller.

The work practices of the advisors fits nicely with the description of a "practice" in Schmidt (2014). He defines a practice as a unity of theoretical knowledge based on rules and regulations adapted to the contingencies in an actual work situation. The advisor opens the call by listening to the caller describing her request. It may be short and fact oriented, like in Example 5.5.4 where the caller asks «Is there tax on a minimum state pension?», or it may be a long narrative with no clear question. The advisor will hear the terms used by the caller, aspects of their voice and emotional status. They will pay attention to how the caller responds to questions, and gather a tentative understanding of the caller's initial knowledge of the topic in question. This understanding will develop throughout the conversation. The advisor's questions or replies will usually be adapted to the advisor's understanding of «where the citizen is» (similar to findings in Muller 1999, Maas and Rommes 2007, Svensson 2012).

From the start of the call, the advisor will need to decide how to reply - whether she will answer the question by giving general or personal advice. By general advice, I mean for example information about opening hours for the municipal tax office, or about rules and regulations to be explained in general terms. For particular details, the advisor may find it necessary to look up information on the external or internal web pages, or in leaflets and posters at her desk.

If the advisor finds it appropriate to reply in a personalised way, he will adapt his explanation of the relevant tax issues to the caller's circumstances. In some cases, the advisor will look up the caller's National Identification Number in one or more of the databases, both to better understand the caller's tax situation and to give advice based on that information. In some calls, the advisor will choose to update information about the citizen in the databases. Based on the empiric material, the choices between giving general and personalized advice is

illustrated in Figure 23. Writing in the databases of the Directorate of Taxes is not encouraged, and the advisor will need to negotiate the routines and file a reason if she does so. At any time, the advisor may move from one approach to another according to how the conversation unfolds.
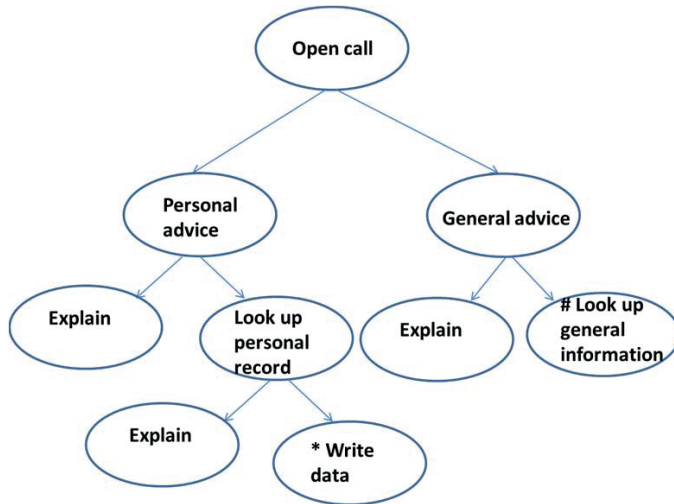

Figure 23: Choices advisors make during a call. Advisors may give general or personalised advice, and in both cases they may look up information. For personal advice, they often look up the citizen's records in the databases of the Directorate of Taxes, and for general advice they look up general information about opening hours, telephone numbers, or in external or internal web pages. The # means that this rarely happens. The * indicates that writing in a database is not in accordance with the routines.

The advisors often give personalised advice and explanations, and there are different strategies for how they do this:

- They explain how some rules can be applied in the caller's situation, or they can help the caller to navigate the online services. They can also tell the citizen which form she will need to fill in.
- If the caller seems stuck with her tax issue, the advisor often engages in a conversation to disentangle the issue and suggests steps to take for the caller. It may very well be that these steps do not necessarily provide a resolution to the caller's problem, but may put the citizen in a better position to handle the issue by for instance providing documentation for claims, or checking the rules of some other public agency etc. In Bratteteig and Verne (2012a, Paper 1), different kinds of disentangling are described and discussed.
- On rare occasions the advisors suggest a workaround (Gasser 1986), such as in the example above where the advisor suggested that the caller's employer call SOL for confirmation of the caller's tax card.

The advisors first try to help callers help themselves, and some callers are content with do-it-yourself autonomy. Other callers need more help from the advisor to change some unfavourable tax conditions, and need support for duke autonomy (Verne 2014, Paper 5). The examples given in the previous section differ in the extent to which the advisor expresses concern for the caller's life and tax situation. The advisors' mastery of their tools and the willingness to disentangle and reach out and help the caller varies. Some advisors are more eager to ask proactive questions that can help the caller to see her issue from a different perspective, like in Example 5.9.2.3 above, where the advisor suggested increasing the caller's income to increase the tax percentage. This will amount to moving from general advice to personalised advice in Figure 23. The advisors make their own judgments about their callers' needs, and their willingness to move from do-it-yourself to support duke autonomy of the callers varies. Verne (2014, Paper 5) describes these two ways of supporting the callers' autonomy in more detail.

5.11 Different levels of complexity

Many callers cannot explain their own economic conditions well. They cannot answer if they pay interest on their debts, and they are unsure about calculating percentages. In the phone calls many young people say they know little about taxes. They often call for their first exemption card or to change from an exemption card to a tax card when they start working regularly. Often the parents call for their young adult children. A call to SOL does not necessarily indicate that a problem has occurred. However, many calls result from complicated interactions with computers, and internal and external structures beyond the citizen's knowledge or control.

After the first co-listening sessions, an early impression formed that the issues of the phone calls could broadly be analysed into three groups:
- Simple questions
- Errors
- Complicated questions

This simple and superficial analysis can to some degree explain why the tax authorities cannot escape the phone calls completely, as errors will always occur and the laws and regulations contain certain complicated topics. Even though I find this analysis still valid, it is now less relevant. The categories are not disjoint. For example, an advisor may suspect that an error lies behind a complicated question. It is not always clear whether an error has occurred, and even less clear where and why an error arose – which amounts to the same as asking who is responsible for the error. Complications arise for the citizens through interactions with private companies and other public agencies, and only a few of them are related to legal issues.

The observation that many citizens posed relatively easy tax-related questions is a starting point for an analysis of the different levels of complexity of conversations between the advisor and the caller (Verne, 2013, Paper 3). This analysis is based on the three levels of complexity used in Star and Ruhleder (1996), which is based on Bateson's communication theory (1972). The complexity of the call is understood in relation to the context of the issues and increases with a wider context.

The first and simplest level of complexity is a request for fact-oriented information or a service, for instance a caller who requests a new tax card. The second level of complexity is a conversation about a first-level issue, for instance a call where a caller suspects something is wrong with his tax card. The third level of complexity is a conversation about a second-level issue, for instance that the caller says that NAV has withheld too much from his benefit.

In many conversations, the caller and the advisor talk on different levels of complexity. The advisor has a wider knowledge of tax-related issues. Information that the advisor considers to be fact may be unknown or confusing to the caller, who does not necessary understand tax terminology. The questions are often on a higher level of complexity for the caller than for the advisor. The advisor may for example suggest that the caller change his tax card online, but the caller does not know how to log in. For the advisor, the conversation is on the first level, but for the caller, it is on the second. The advisor also has a better understanding of the context. For example, if the citizen is also communicating with NAV, he may feel stuck between two public agencies. The advisor may be on the second level of complexity but the caller on the third.

When the caller and the advisor communicate on different levels of complexity, trans-contextual difficulties arise and may lead to misunderstandings or responses which are unsatisfactory to the caller unless the advisor takes the time to explain thoroughly, or provides support for duke autonomy. This analysis emphasises that doing taxes is enacted in complex interactions in a wide context, and most citizens will need to learn the conditions that apply to their particular circumstances. This analysis is in line with Bratteteig and Verne (2012a, Paper 1), which finds that a complicated life situation for the caller is part of what makes doing tax difficult.

6. When automation is not enough

The automation makes doing taxes easier for many citizens. Some of the tasks that previously were part of doing taxes are now unnecessary, such as documenting bank accounts and employee salary. However, some new complications arise when tax is computerized and automated. The invisible nature of automation makes the citizen less aware of what the tax authorities do and what remains to be done by the citizen. It is easy to think that automation covers more than it does. The tax authorities and the citizens have different responsibilities and tasks. The tax authorities have made and run the computer systems and the work routines that their case handlers follow. The citizens may now legally do nothing, but often they will need to fill in with manual tasks.

In this chapter, I give a second-level analysis of when automation is not enough, and theorize about what kinds of tasks that are not covered by the automation. These remaining, manual tasks are seen as residue after the automation, and will be used to describe more precisely the division of work between the tax authorities and the citizen. First, I will take a closer look at the residual tasks for manual handling, and then I will describe some new tasks that emerge. Based on this analysis, I will theorize about the relationship between old and new tasks.

6.1 Residual tasks and companion tasks

For many citizens, most kinds of deductions are automatically documented via the tax authorities' collection of data and many are therefore not used to providing documentation for claims. However, as we have seen in the previous chapter, for some deductions the citizen will need to provide documentation manually.

The caller in Example 5.6.1, who wanted to deduct costs for diabetes, needs to know both that the documentation is necessary, and what kind of documentation is necessary. Finding out what kind of documentation is needed and providing it, is a residual task; such costs would have had to be documented also before the automation. However, the citizen will now have less practice in providing documentation for claims. Automation bias is described by Cummings (2004) to occur "when a human decision maker disregards or does not search for contradictory information in light of a computer-generated solution which is accepted as correct." Automation bias may lead the citizen to not search for further information about the need to document certain claims. Documenting claims previously formed parts of a whole and is now residual after the automation.

Finding out that costs for diabetes is not deducted and documented automatically is a new task, in contrast to previously where all claims needed to be documented. Sorting out which claims need documentation and which do not is a new task required from the citizens. In this way, the residual tasks become accompanied by a new task of finding out, which emerges together with the old, residual task.

Some of the residual tasks are more generally known than the others, so that little work is involved in the *companion task* of finding out. For example, many people know that they will need to change their address manually in the Population Register when moving house, or change their tax card if they take up a loan. The companion task of finding out that a manual change of address is necessary is less generally known when the address is changed by the municipality. The same goes for the companion task of finding out if a health-related cost is

deductible in addition to those that are filed automatically. If a citizen receives a disability pension from the National Insurance ("Folketrygden"), the tax deduction for disability will come automatically. If a citizen receives a disability pension from other sources, the tax allowance for this pension will not be automatically reported and will need to be manually entered in the tax return form by the citizen[27]. The way the automation is done, and how the tax authorities organise its collection of data, splits the task of documenting the deduction for the same kind of pension into one automated task and one manual, depending on the source of the pension. Finding out is the companion task.

The citizen will also need to learn how to provide the documentation. Previously all kinds of documentation were attached to the paper tax return form. Now the documentation will have to fit the way in which the tax return form is submitted: as a paper attachment to a paper tax return form (as previously), as an electronic attachment, or posted separately on paper if the citizen submits the tax return form electronically. Finding out how to submit the documentation is also companion work for the citizen.

When the welfare agency in Example 5.8.2.1 finds out in April, three months late, that the new tax card of a citizen has not been received - and automatically starts withholding 50% - the citizen and his welfare worker needs to find out what has happened. The work of actually requesting a new tax card will probably be quite similar in December or in April the year after, and the extra disentangling work that is necessary to finding out what has happened is companion work.

To understand what kinds of documentation is needed and when, requires some kind of understanding of the automation processes which are not transparent for the citizens. This makes the companion tasks of finding out more intractable for the citizens. To identify the residual tasks of the automated processes, they need some understanding of the automation as well. Is it possible to imagine another design that makes the processes more transparent for the citizens and reduce the size and number of companion tasks? I will come back to this question in the discussion section.

6.2 Genuinely new tasks

A companion task of finding out has emerged, but otherwise will most of the residual tasks pass through the automation unchanged. However, some genuinely new tasks have emerged after the automation. These can be seen explicitly for some tasks, and more indirectly and tentatively for other tasks. When the citizen in Example 5.5.4 received a tax card where she expected an exemption card, she called SOL. The advisor confirmed the caller's opinion and agreed that she was eligible to an exemption card, and explained that the reason was a built-in default. Overriding this hidden default is a new task that emerges as a direct consequence of *how* the automation is designed. A different built-in default could give other consequences.

I illustrate with a recent personal example of how another genuinely new task is introduced as a consequence of how the automation has been designed. In 2014, an electronic tax card has been introduced for all citizens. The tax authorities produce the tax card in the same way as before, and the citizens will need to register personal data or apply for it as previously, but the electronic tax card is distributed online, by being accessible to employers that request it.

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[27] http://www.skatteetaten.no/no/Tabeller-og-satser/Sarfradrag-for-uforhet/ (in Norwegian). Retrieved 1. Dec 2014.

There is a new online service where a citizen can log in and see the employers who have requested access. Also this new task comes together with a companion task of finding out.

Figure 24: Screenshot from the author's electronic tax card, a new online service from 2014. We can see that three employers have requested online access to my tax card, but currently I have only one employer.

Figure 24 is a screenshot of my new page where we see that three employers have requested access to my online tax card. I have only one employer this year, The University of Oslo. I have marked with an ellipse where the Tax Administration states that if the list contains employers which do not need my tax card, I will have to contact each of them. No address or other contact information for these employers is given, and it is left for me to decide how I wish to contact them. I might want to write a formal letter. However, I started to wonder whether I perhaps had misunderstood who my employer was, because the Research Council of Norway was listed. Perhaps a PhD-student has two employers? Disentangling this situation and writing a letter to the Research Council represent more work than handing in the previous paper tax card to my employer. In addition, finding out and contacting unauthorized employers will be a less logical and natural task than handing in a tax card to the employers that I currently have a relationship with.

Doing taxes involves the citizens at the least between one or three times a year, in principle. In the beginning of the year, the tax card needs to be checked and, if necessary, updated. In April or May, the pre-completed tax return form needs to be checked and, if necessary, corrected. In June or later in the autumn, the tax assessment needs to be checked. In addition, a citizen might eventually want to complain if he or she does not agree with the tax assessment. If everything functions smoothly, the citizen may now do nothing.

Computer systems follow rules strictly and correct use of the tax terms is important for online self-service. Many citizens will on some occasions need to know the internal structure of the Tax Administration and its databases, and disentangle occurrences that include

employers, municipalities and other agencies to find out what to do to. Because the automation and the use of defaults make it feasible and tempting to do nothing, there are few opportunities for the citizens to learn and grow with the tasks. Many callers show little understanding about the underlying processes necessary for automated tax to function. When they need to become actively involved in doing their taxes, they are often prompted by something unexpected happening.

6.3 Ironies of automation

There is a high degree of trust from the citizens to the Norwegian tax authorities. Many citizens believe that the tax authorities know more than they do, as expressed by one caller who said: "You know everything already, don't you". Nina said that some callers believe that the tax authorities have direct access to their bank account. This trust makes them less inclined to check and correct their pre-completed tax figures. Nina says that the callers "think we know everything and they believe everything we do is correct, and therefore they become very surprised when something happens that they did not expect" – for example if they receive a bill for underpaid tax or if a claim about cost deduction is not accepted. Most citizens appreciate the high degree of automation of taxes.

In this section, I will add a theoretical understanding of how the tasks of doing taxes are changed after the automation, and how to identify the line between automation and manual tasks. In the analysis of how automation functions for the citizen I draw on the "Ironies of Automation" by Bainbridge (1983): When the tasks that can be automated become automated, only the tasks difficult for the machine are left for the human. The human operating the automated system acquires little experience with the tasks as a whole and often have to address the remaining tasks when they arise with little contextual information. The human is poorer equipped for these tasks than before the automation was introduced.

Doing taxes is a task area that is not clearly defined for the citizens (illustrated in Figure 25). For example, events in their life may trigger a need to update their tax cards without them being aware of this.
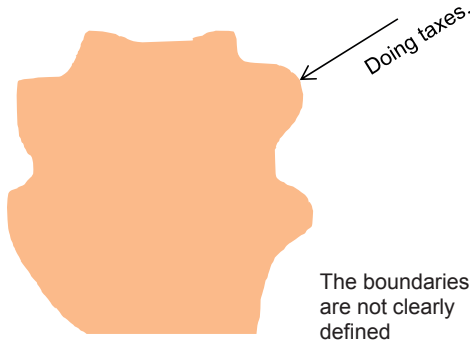
Figure 25: Doing taxes is not a clearly defined task area for the citizens.

Many tasks are made redundant by automation, in particular those tasks that can be specified by the tax authorities to the degree necessary for automation to take place

(Bainbridge 1983). The automation does not necessarily cover the same area completely (Figure 26).

In addition, I have argued that automation introduces new tasks for the citizens, marked with the little circle in Figure 26. The circle is positioned outside of the old task area but inside the automation to indicate that these new tasks consist of correcting errors from automation or overriding automation-internal, hidden defaults (like in Example 5.5.4 where the built-in default of 80 % of the standard deduction needs to be overridden).
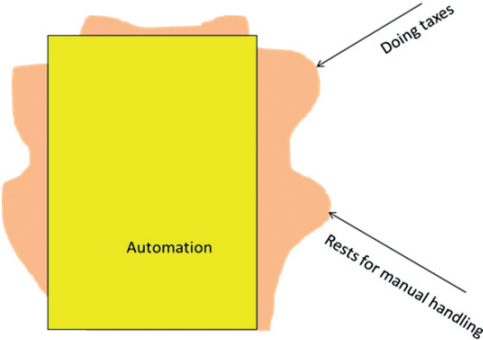
Figure 26: Automation introduces new tasks, indicated by the little circle. The new task is located outside of the old task area, but inside the automation.

The genuinely new task of contacting employers who erroneously have received access to my tax card is different. This task is a consequence of how the automation is designed, but there is no support by the automation to carry it out. This new task is indicated as a circle further away from the old area in Figure 27.
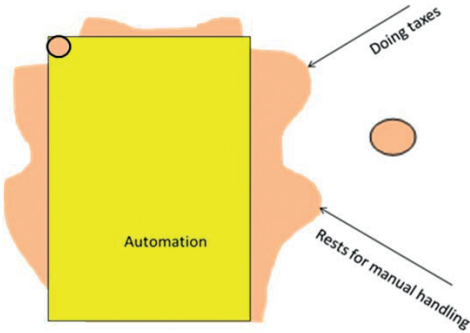
Figure 27: Automation introduces some genuinely new tasks, indicated by the circle outside of the old task

Some of the tasks concerned with doing taxes before the automation have now become redundant, while some new tasks are introduced. The redundant tasks are not visible, and the residual tasks together with the new tasks are illustrated as fragmented rests outside of the old task area in Figure 28. These parts are not easy for a citizen to address as they show little internal coherence or logic. The new tasks increase the fragmentation of the task area for the citizen.
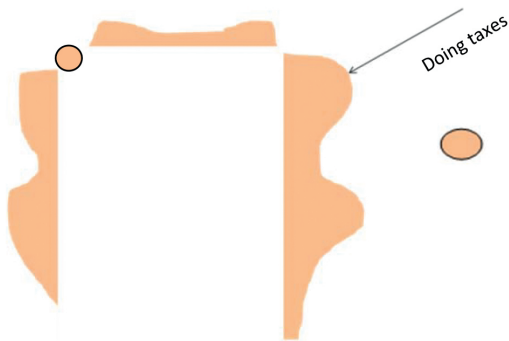
Figure 28: Fragmented residual tasks together with new tasks left for human handling after automation.

A redundant task, for instance documenting deduction claims for interest paid to a bank, is indicated by the dotted circle, marked 3, inside the automation area in Figure 29. A residual task, marked 4, is indicated together with its companion task of finding out. The companion tasks expands the original task area.
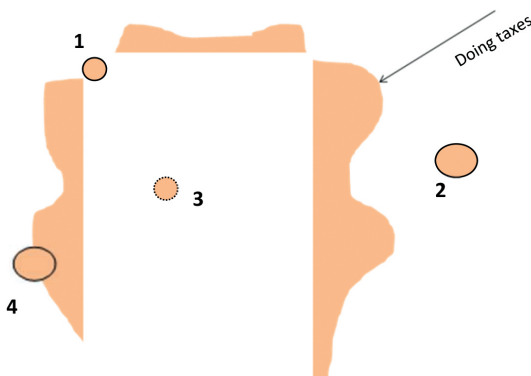

Figure 29: The fragmented residual tasks illustrated together with redundant and new tasks.

After the automation, there are four kinds of tasks with different relations to the old task area of doing taxes. These are indicated by numbered circles in Figure 29:

1. illustrates the new task of handling errors from automation or overriding (hidden) defaults.
2. is the genuinely new task of, for example, finding out and writing a letter to employers who are not authorised to access the electronic tax card.
3. illustrates an old task which is made redundant, but can be done voluntarily, for instance manually handing in the tax return form when it is not strictly necessary.
4. illustrates a residual task together with its companion task. The residual task is located within the original task area, and finding out is a new task that is located outside.

6.4 Summing up old and new tasks

I will end this section with a schematic overview of how the old tasks are influenced by the automation and how new tasks emerge. The effects of automation are illustrated in a matrix in Table 14 as the relationships between what is covered by the automation and the old and new tasks.

Task ⟍ Automation	New	Old
Outside	Genuinely new tasks: Contacting unauthorised employers. Includes the companion task of finding out. Figure 29, task 2.	Residual tasks: Update personal data; manually provide documentation for deductions. Includes the companion task of finding out. Figure 29, task 4.
Inside	Correcting errors or overriding defaults. Figure 29, task 1.	Redundant tasks: e.g. submitting the tax return form, can be done voluntarily. Figure 29, task 3.

Table 14: The relationships between old and new tasks inside and outside of the automation.

The tasks that are located outside of the automation are all accompanied by the task of finding out. To find out which tasks are redundant, and which are still necessary to do manually, the citizen need some knowledge about and experience in doing taxes, or they call SOL. Some system understanding of how the automation is done will also be beneficial. Whalen (1995) argues that a human need to understand why the machine makes recommendations or takes action. If a citizen can infer the automation in Figure 29, the residual tasks will seem less fragmented.

Figure 29 illustrates why SOL receives telephone calls about very simple tax-related issues. Often a caller ask for a confirmation if a certain task is redundant, which means that these tasks still entail a telephone call to SOL. Many of the calls to SOL can be explained as part of finding out. Jan Tore's words from Section 5.2 about the tax authorities having "enormous possibilities for sanctioning you if you make a mistake" give a good rationale for the citizens' needs to finding out.

7. Discussion

There are many reasons why doing taxes becomes difficult for citizens even after automation has made many former tasks redundant. In addition to tasks left for citizens to do, my analysis shows that some new tasks have emerged. The old and new tasks that make up doing taxes for citizens today are fragmented and do not present a coherent whole that is easy to understand.

The mismatch between the abstract and formalized tax rules and regulations, and the messy and fluid circumstances of everyday life, calls for interpretations and translations between the citizen's life and formal, rule-based concepts of tax. From the perspective of the SOL advisors, many of the questions seem simple (Verne 2013, Paper 3), but citizens acquire little practice and experience of doing even easy tasks, as many of these have been made redundant. When citizens need to address their tax issues manually, it will often be as a result of a change in their life circumstances, or because a situation has been triggered by the tax authorities when some change or error has occurred.

A Danish study of citizens' relation to the welfare agency supports the findings of my research. The notions of "bureaucratic rationale" and "everyday rationale"[28] are used for digital services and citizen's lives, respectively (Skaarup 2011). The bureaucratic rationale of the public agency is recognized by efficient data collection, formal correctness, well-defined tasks, disciplinary expertise, equality before the law, and equal treatment. The everyday rationale of the citizen is recognized by fluid and not well-defined borders between situations and tasks. Accept and understanding are important, and different individuals, life experiences, and situations need to be handled differently. Individual experiences of being a full citizen is important (Skaarup 2011).

Using online services may introduce additional complexity (Shipman and Marshall 1999; Dourish 2001). Breit and Salomon (2014) tested an online service for calculating pensions with users, and found five critical stages that each operated as an obstacle for the users' digital service process: interest, access, comprehension, reflection, and support. Their argument that citizens need to acquire both financial and digital skills, otherwise they "are likely to be disadvantaged by the services" (Breit and Salomon, 2014, p. 12) are in line with my results.

Citizens often call SOL for a confirmation of their own understanding of the rules. The tax authorities impose heavy sanctions on intentional tax avoidance; in addition, many of the callers indicate a moral desire to file their taxes correctly. When automation is the expectation and the rule, the companion task of finding out that a particular task is not among the redundant ones, requires some effort from the citizen. Finding out can take from seconds to hours depending on the circumstances. Firstly, the citizen will need to be alerted that some manual steps are necessary for correctly filing their taxes this year; this first step may include a telephone to SOL for confirmation. Following this, the citizen may need to read leaflets, tax magazines or books, check up on the tax web pages or other sites on the Internet, ask people, or call SOL to find out how the issue should be handled. The task of finding out requires of course more effort the first time, and may be almost non-existent if the citizen has prior experience in handling the issue.

Automation hides the inner workings of the processes. However, automation is designed to meet certain specific objectives and should not be thought of as a "black box. The relation between old and new tasks is intimately linked to the way in which the automation is designed. Knowing which tasks remain after automation requires some kind of understanding

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[28] Translated from Danish.

from the citizen of the particular sociomaterial assemblage of the particular automation design. An alternative automation design, designed to meet other objectives, could result in a different relation between residual and redundant tasks, as illustrated in Figure 30.
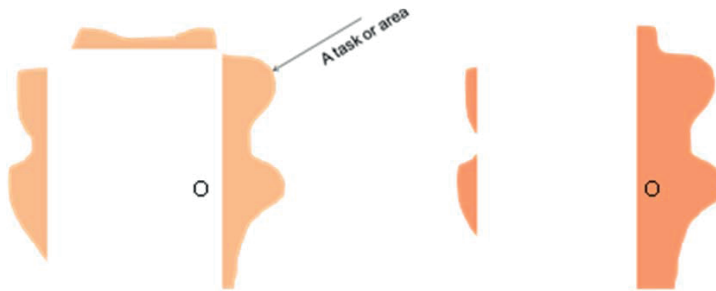

Figure 30: Two different ways of automating the same area will leave different tasks to be dealt with manually. To find out if an unfamiliar task, represented by a circle, is redundant or not, it will be necessary to have some insight into how that particular automation is designed.

To find out if one particular task is residual, the citizen will need to understand some of the internal workings of the automation. This claim stands in contrast to the view that the whole point of automation is to hide complexities from view. I argue that hiding the inner workings introduces new kinds of complexity, which may seem less logical from the citizen perspective than the original ones.

7.1 Implications for design

Government agencies have a wide responsibility, and need to balance between efficiency and democratic values (Lindgren and Jansson 2013). Public organizations need to responsibly serve social justice and the common good, and take both democratic values and economic targets into account. Democratic values are founded on the public rights and rules of law, and economic values are mainly founded on balancing the use of resources according to a set of economic targets and revenues. Public organisations need to ensure rights, obligations and access for all citizens because the citizen cannot opt out (Lindgren and Jansson 2013). Automation as in Figure 29 above will often strive to exploit the possibilities for automation. However, there are other perspectives for design (Suchman 2002). Design from a citizen's perspective can aim to construct a set of coherent and well-suited tasks for a citizen, tasks which they will understand more easily, but which in practice will mean drawing a different dividing line between the automated and the non-automated parts. This way of designing is illustrated in Figure 31 below.

In Figure 31, the residual tasks that are remaining after automation are designed to be more coherent for a citizen and the automated parts are illustrated more rounded and less square, indicating that the aim is that they are experienced as smoother for the citizen. The division of work between the citizen and the automation is still visible, and to support citizens' understanding of which tasks remains, the citizen need support for peripheral awareness of what the tax authorities have done via the automation. Supporting awareness means that the computer support needs to provide some mechanism for participants to be aware and observe

the relevant actions of the tax authorities without explicitly looking for it (Schmidt 2002). Here, I use the notion of peripheral awareness support to indicate that the human also needs information about what the "automatic collaborator" has done.

Figure 31: The same task area with a different technology design. The focus is on designing tasks that are coherent and easily understood by humans.

A coherent task or area, easier for humans to handle

The work division between the tax authorities and the citizen was very clear in the days of the old paper forms: the citizen gathered the personal tax information from various sources and the tax authorities provided the form with a particular structure for the citizen to fill in. In addition the tax authorities checked (some of) the information given by (some of) the citizens. The paper form provided a map for structuring the information (Schmidt 1999) by giving an overview of the whole tax system and opening up for learning by exposing everyone filling in the form to sections that may not be relevant today but possibly could become relevant at some later date (Axelsson et al. 2007). This is the background for Per's experience that *"The winners are those who have used the old paper form".* The design challenge is to support citizen overview, learning, and autonomy and at the same time employ automation for simplifying the processes.

The tax authorities cannot completely avoid the division of labour with the citizens. It will not be possible to automate everything related to doing taxes for all citizens – at least without imagining a completely controlled society. Many tax-related events in a citizen's life are not registered in data bases, and for those that are, the registration is often delayed. The tax authorities have no sources for knowing, at least *at the time when it happens,* that a citizen e.g. is sick, starts working, moves house, commutes, gives birth, or takes up a loan. To ensure a correct tax card, this information will need to be provided explicitly by the citizen. Notifications of some of these events in the form of data exchange with other public agencies will reach the tax authorities later, and the taxation will adjust itself automatically. However, until the information is captured in electronic form and has meandered through various private and public databases, the citizen will not be adequately represented in the tax authorities' databases unless she changes the representation herself.

Legislation is intentionally underspecified, and usually has openings for use of discretion. Rules and regulations need to be interpreted in specific cases by a human case handler (Lipsky 2010). A citizen will at times need to argue for and document her own interpretation of the rules, as in Example 5.7.2 where the advisor explained that the caller should "Have a try" in a case of doubt about commuting rules. The citizens will at times need to act pro-

actively by arguing for her point of view in order to achieve the best taxation. By definition, automation cannot use discretion.

A design that makes the division of work between the automation and the residual manual tasks easier to understand has the potential of supporting citizen learning. By pointing to spaces for action and choice, the design can support citizen autonomy. Being able to disentangle a situation is important for seeing a space for action where different choices are available. To make beneficial choices for oneself, some understanding of the inner workings is needed. When talking about knowledge-based systems for users, Shipman and Marshall (1999) say that "Users must learn the system's knowledge representation, even if it is hidden by a good interface, or else they will not fully understand the effects of their changes". Making changes without understanding their effects may lead to unfortunate choices and be fake autonomy (Thaler and Sunstein 2008).

7.2 Design suggestions

Doing taxes is a semi-automatic process for the citizens, where they will benefit from a certain understanding of the dividing line between the automated parts and the manual tasks. My research gives the basis for practical advice for how the tax authorities can better support the autonomy of the citizens. With the old and the new tasks as a basis, see Table 14, I suggest ways that the tax authorities can improve the design and communication with the citizens.

> **Redundant tasks:** The tax authorities can provide support for awareness about the coordination of work between the automation and the citizens. The tax authorities can explain what is done automatically, and that some of these tasks can be done manually for the citizen's own overview and feeling of coherence. In particular, they can be more specific about what information is gathered from which agencies and enterprises - for those who seek such information. This will help the citizens with *finding out* and amount to some kind of awareness support, which will make the space for action more visible to the citizens. They can provide confirmation and receipts that will increase the citizen's understanding of the processes involved. For instance, a citizen can receive a confirmation when she changes her tax card. If she does not receive such confirmation, something may be wrong and based on her receipts, she knows where to look into it herself before she calls SOL. A confirmation can also contain additional information about processing and estimated waiting times etc.

> **Residual tasks:** The tax authorities can be specific about what data they do not collect, or tasks that are not supported by the automation, such as taking care of and providing special documentation. The citizen will need to be aware of non-events as well as events, for example: if a tax deduction is dependent on commuting, costs will need to be documented when not commuting. This will help the citizens to identify the residual tasks to be done manually and to identify the boundary between the redundant and the residual tasks.

Overriding defaults and correcting errors: The tax authorities can be open about defaults that may be overridden as well as internal practices and procedures. They can explain that for safety's sake only 80% of the standard allowance is deducted when the tax card is calculated. Citizens can also be reminded that errors may occur.

Genuinely new tasks: The tax authorities will need to identify new tasks and explain them to the citizens. For example, the tax authorities already explain that citizens will need to contact unauthorized employers that have requested their tax card. These tasks are the most difficult to be specific about as they are intimately connected to the particular design solution, and they may be unanticipated and far-reaching.

If the information on the tax authorities' website is presented more graphically and interactively, it will become more accessible to many citizens. For example, an animation of how percentage tax functions could illustrate this principle to those who find it hard to calculate percentages. Graphical diagrams could be used to illustrate the annual cycles of taxes, where it would be possible for the citizens to understand how their doing taxes fits in with the tax authorities' work.

Based on my analysis, the above list contains design guidelines directed towards those citizens who have experienced the changes from the previous paper-based procedures. Because it focuses on the changes introduced by automation, it will give little explanatory power for those citizens who do not have pre-automation experience and hence have no expectations of neither new nor old tasks. However, the list is useful also for these citizens as a structuring mechanism to explain the tasks even without a reference to the old and new tasks.

If we do not take into account the division between old and new tasks, the four-square matrix of Table 14 collapses into two rows: inside and outside the automation. This division bears some analogy to the analytical framework of human-machine interaction of Suchmann (2007), where she distinguishes between user actions available to the copying machine and user actions not available to the machine. The difference from Suchman's users is that they can experience their own interactions with the machine directly – tasks such as clicking the control panel, opening and closing the doors, putting more paper into it etc. In contrast, citizens have little direct experience of which data about themselves the tax authorities has access to. Some tax-related data is still not collected automatically, such as the disability deduction described in Section 6.1, and citizens will need to learn to manually enter this information in the tax return form and document the claim.

Because the design and organisation of the automation is not familiar to the citizens, the tax authorities can provide help with the task of "finding out". We may be able to imagine a different design in which the focus is on making the task of "finding out" easier. Some relatively easy adjustments to how the tasks involved in doing taxes are presented and communicated would improve the tax authorities' communication with the citizens. SOL receives many quite similar-sounding requests. An easily available list of Frequently Asked Questions (FAQ), based on questions to SOL, could help the citizens in "finding out", and reduce the number of simple questions to SOL. There are some FAQs on their webpage

today[29]; these are focused on explaining tax concepts and seem to presuppose that citizens have a basic understanding of what they need to know. A more helpful FAQ list could be based on citizens' life situations and activities with answers providing advice on finding the right slot in the "shape sorter". Complicated tax language is an issue, and the tax authorities are already working to reduce the level of bureaucratic formality in their written communication.

In addition, certain internally-oriented activities could contribute to better communication with citizens. Better communication between the different units of the tax authorities can give a more coherent presentation to the public. In addition, aiming to make automation-friendly rules and regulations can make them clear and easy to understand for humans (Schartum 2014).

These design suggestions constitute an answer to the initial research approach described in Section 3.2, although on a higher level of abstraction. Instead of presenting and trying out concrete solutions for social media communication with the citizens, I describe a framework for learning from the callers as a background to design for doing taxes.

7.2.1 Learning from the citizens

Through the calls, SOL advisors experience what makes doing taxes problematic for citizens. They register each call in the log, categorised according to the issue of the call. The categories (at the time of my fieldwork) represent a mix of tax-related topics and actions taken by the advisor. The log is mostly used for work flow, statistics and internal accountability (Verne 2015, Paper 7). The call in Example 5.3.2, where the caller claims that she has tried to change her tax card online but no changes have been registered in the data systems some weeks later, was categorised as "tax card – change", and the advisor added in the free text field "changed table-based to percentage-based". There were no categories for expressing that the caller had tried to use the online services without result. The statistics based on the log cannot be used to improve the web sites. In their work to improve their websites and their online services, it could have been valuable for the tax authorities to learn from these reports from the callers.

Phenomena that cannot be described by a category is silenced, and are not acknowledged in the ontology of the set of categories (Star and Bowker 2007). Many of the problems and experiences of the callers are silenced in the log records. In the ontology of the category system, errors or difficult web pages do not exist. In Verne (2015, Paper 7), I have identified two kinds of silencing: One is when there is no category that describes for example technical errors or web pages that are difficult to navigate. I suggest the notion "ontological silencing" when the category system does not contain a category to describe this challenge seen from the caller's perspective. I suggest the notion of "priority silencing" when there is a category that describes (part of) the caller's challenge, but the advisor choose to focus the categorisation on their own actions.

In Verne (2015, Paper 7) I suggest an alternative set of categories based on the challenges identified in Chapter 5. The alternative set of categories has a different politics and a perspective of describing the callers' issues and problems when doing taxes, making these available to the wider tax organisation through the log data. This set of categories will enable and support new ways of collaborating within the tax authorities to improve the online

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[29] See for example http://www.skatteetaten.no/en/Person/Tax-settlement/FAQ-about-tax-settlement-notices/

communication. The log based on categories that describe the callers' challenges could pick up tax terms that are difficult to understand, topics that are not so well described on the web pages, technical peculiarities and errors from citizens who have tried using the web without finding what they look for. This can be candidates for entries in a FAQ as described above. The statistics based on the alternative category set will better explain why the citizens call.

Young people have little previous knowledge about taxes. My analysis indicates that Internet experience contributes only marginally to succeeding in doing taxes online. Because of little experience in doing taxes, young citizens are more susceptible to "shape sorting" issues of matching their own life with the tax authorities' terminology. Familiarity with Facebook does not help much with doing online taxes.

Verne and Braaten (2014, Paper 6) report from design workshops for doing taxes together with young people at two secondary schools. Design workshops are an opportunity to learn from the young citizens about their needs for support for doing taxes. Participatory design is about giving those who are influenced by a design a voice and a say in the design process; in addition, it aims at mutual learning between the designers and the non-designer participants in the design (Simonsen and Robertson 2012).

In the design workshops, the students made design suggestions for their personal needs; in addition, they expressed an interest in the political aspects of tax by asking questions such as "Where does my tax money go?" The workshops resulted in a prototype of a smartphone app that will give an overview over personal tax-related information, together with graphical tools to illustrate the taxation in various ways, see Figure 32 a and b.

Figure 32 a): Students at work in a design workshop about doing taxes at their school (above). Figure 32 b): The resulting prototype of the Tax-App (SKAPP in Norwegian) with a menu for (from the top): My page, Tax lexicon, statistics, Taxulator, Questions and answers, Search, Contact us (right).

The prototype includes possibilities for simulating how different future changes in one's life situation would influence doing taxes as well as reminders of important dates. It helps providing information that would create an overview for the student. The design process and the app are described in more detail in Verne and Braaten (2014, Paper 6). In her master thesis, Ida Braaten is developing the prototype further, see Figure 33.
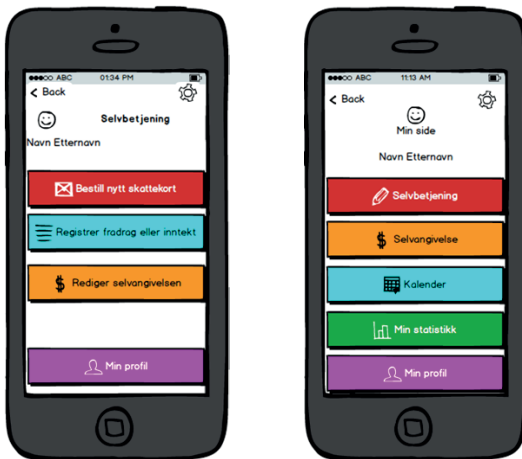
Figure 33: Prototypes for a personal tax app developed by Ida Braaten. To the left is the screen for self-services, with a menu for ordering a new tax card, registering deductions or income, and editing the tax return form. At the bottom is My Profile. To the right is the screen for My Page, with a menu for self-services, tax return form, calendar, My statistics, and My profile.

These prototypes contain both personal tax-related data for look-ups and editing, as well as statistics and important dates.

7.2.1 Tax as a formalism

Having to fit one's own life into categories created by others is disciplining (Suchman 1994b). Users resist disciplining systems because of the cognitive costs and extra effort necessary in trying to fit one's own experiences and descriptions into "the system's knowledge representation": a formalism for intellectual work that can be processed by a computer (Shipman and Marshall 1999). Many systems fails because of rejection by the prospective users; however, citizens cannot reject the tax system. High cognitive loads may be a result. To minimize problems from formalisms, Shipman and Marshall (1999) suggest five approaches based on research on the use of systems for intellectual work:

1. Identifying the essentials for a task, because failure to do so may lead to rejection of the system.
2. Evaluating cost/benefit trade-offs to select features to implement, and let optional stuff come later.
3. Gradual formalization and restructuring, so that the users may grow with the tasks.
4. Ephemeral structure on demand, so that users can understand internal structures and understand when the system has made a wrong inference.
5. Training, facilitation, and intervention. Training is often not enough to learn embedded formalisms, both facilitation and human intervention during use may be important.

These approaches are based on experiences from tailor-made system development in a professional work environment. They do not fit completely with the situation of the citizens doing their taxes, but they still add some insight. A citizen may reject a computer-based or online system for doing their taxes, but they cannot reject the system of tax laws and regulations, or the automated system doing their taxes. Some way or another they will have to interact with the automation, even if their interaction is to do nothing.

One interesting feature of these five approaches is their user centeredness. The five approaches gives support to my design suggestions for doing taxes:

"Identifying the essentials for a task" is in line with my suggestions to design support for doing automated taxes seen from a citizen perspective, and open up for questions such as: What kinds of tasks will the citizens need to do manually? The essentials of doing taxes are to check the pre-completed figures and *find out* if there are some manual tasks to carry out.

"Evaluating cost/benefit trade-offs to select features to implement" may seem irrelevant for doing taxes, however, it opens up for designing features that are needed from a citizen perspective as well. A modified log of questions from the callers as described in the previous section is a starting point for identifying features to implement.

"Gradual formalization and restructuring" is very relevant for support for doing taxes. Young people need to learn doing taxes as beginners, and a gradual formalisation enables them to develop their understanding of taxes as their life situation changes. It also opens up for a need to learn that other options (or rules) are available. The personal example in Section 5.2 where a different category for pension income gave a lower tax rate illustrates the need for restructuring.

"Ephemeral structure on demand" is connected with designing transparency of the inner workings of the automation, and may open up for supporting the citizens' own disentangling of complicated situations. Support for awareness of what the "automatic collaborator" has done is related to this approach.

"Training, facilitation, and intervention" makes an inverted argument: without training and facilitation, the citizens may find it difficult to learn the formalisms of doing taxes.

In addition, Shipman and Marshall (ibid.) argue that they "sacrificed inferencing" for easy understandable rules which they found to be a better design principle than automatic decision making. This is in line with the design approach illustrated in Figure 31 that focuses on coherent tasks for a human instead of exploiting all possibilities for automation.

7.3 Semi-automation and Cummings' Automation Levels

The Norwegian Tax system is in effect semi-automatic as long as manual tasks are both possible and necessary. On Cummings' (2004) list of automation levels, semi-automation spans levels 2 to 6. The automation levels are described in Section 2.1 and repeated here:

1. The computer offers no assistance: human must take all decision and actions.
2. The computer offers a complete set of decision/action alternatives.
3. The computer narrows the selection down to a few.
4. The computer suggests one alternative.
5. The computer executes that suggestion if the human approves.
6. The computer allows the human a restricted time to veto before automatic execution.
7. The computer executes automatically, then necessarily informs humans.
8. The computer informs the human only if asked.
9. The computer informs the human only if it, the computer, decides to.
10. The computer decides everything and acts autonomously, ignoring the human (Cummings 2004)

Because citizens can change the pre-completed tax return form before the deadline, the Norwegian Tax system can be interpreted to be on automation level 6, where humans are allowed a restricted time to veto before automatic execution. That citizens also have access to lodge a complaint and request a second judgment by a human case handler if they do not agree with the automated results makes the automation level less clear. The automation of taxes is not easily fitted into the automation levels of Cummings.

Figure 26 in Section 6.3 can be used to illustrate and discuss Cummings' levels of automation (2004). Level 1 on Cummings list involves no automation, while level 2 is "The computer offers a complete set of decision/action alternatives". Possible decisions and/or actions are calculated, but the computer gives little support for choosing among them. This level of automation is illustrated in Figure 34. A large area for residual manual tasks remains after the automation.
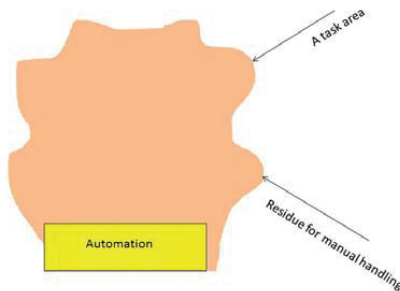
Figure 34: Automation level 2: The computer offers a complete set of decision/action alternatives (Cummings 2004).

Level 10 on Cummings' list is "The computer decides everything and acts autonomously, ignoring the human". The interesting point with this level is how "ignoring the human" is to be interpreted: does it mean that there are no residual tasks to carry out, or that the human is not allowed to intercept? This is an important difference: is the automation sufficiently well designed that all possible events and contingencies are pre-determined by the computer instructions?
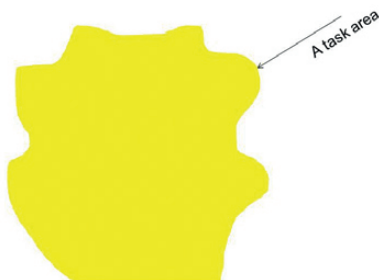

Figure 35: Automation level 10: The computer decides everything and acts autonomously, ignoring the human (Cummings 2004). The automation covers exactly the same task area and there are no residual tasks.

Figure 35 illustrates that the automation on level 10 gives no residual tasks for a human because the automaton covers exactly the same task area as previously. There are no adverse effects from too much automation. The pre-condition is that all possible events and contingencies can be pre-determined and programmed. However, interpreting automation level 10 to mean that the human does not get a change to intervene is illustrated in Figure 36. The residual tasks are inaccessible or silenced. Whether this situation is problematic will depend on the nature of the residual tasks, and who decides their necessity and importance.
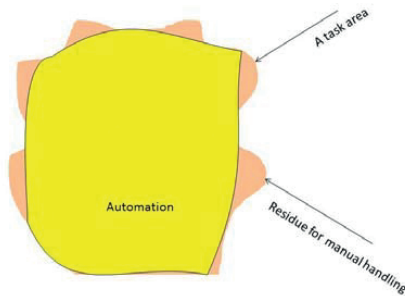
Figure 36:
Automation level 10:
The computer ignores
the human who is not
allowed to carry out
residual tasks
(Cummings 2004).

To make sure that there are no inaccessible or silenced residual tasks, the automation can be designed so that it covers the whole task area and possibly more, as illustrated in Figure 37.
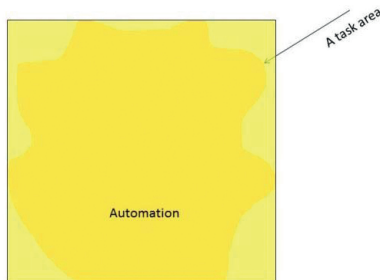

Figure 37:
Automation level 10:
The computer ignores
the human. There are
no manual tasks left,
and the automation
does too much
(Cummings 2004).

There are no residual tasks, and the automation covers more than the original task area. This can for example imply that new tasks or many technical issues are introduced. How the residue in Figure 36 or the consequences of too much automation in Figure 37 is managed, will influence how level 10 will function in practice. Cummings' (2004) automation level 10 does not differentiate between these interpretations. How well the automation will function in relations with the humans that are influenced, governed, managed or advised by the automation will depend on this. It is room for different design choices also for full automation at level 10.

Cummings' automation levels are developed for time-critical systems. Often there is no time for regret or a second consideration in time-critical automatic systems. In contrast, when citizens do their taxes, there are many opportunities for reconsidering an automatic decision. The citizen can call SOL for advice, they can change their automatically generated tax card whenever needed, and they can lodge a complaint for a second case handling if they do not agree with a tax assessment. There is no description of a manual second opinion in Cummings' levels. Because of the access to lodge complaints, I suggest to locate the tax automation on level 4, where the computer suggests one alternative.

To engage citizens and stimulate their concern for doing taxes, practice is important. The lower automation levels 1 to 3 give the human an active role in doing their taxes. From level four and upwards the human is less active, and merely accepts decisions from the computer.

7.4 Design for autonomy

Doing taxes correctly is ultimately the responsibility of the citizen. This is implicit in the law, and is stated by both advisors and managers at SOL. Instead of a signature – blue ink on paper or a digital signature – that pinpoints responsibility for the correctness and completeness of the figures and information entered on the tax return form, the "silent consent" makes the responsibility more implicit and abstract. To be real, responsibility requires understanding. How can citizens take responsibility if they do not understand? Citizens have different preconditions and competence for doing their taxes, and I have argued that they also have too little opportunity to learn from practical experience.

Shipman and Marshall (1999) suggest that a "gradual evolution of human understanding during task performance" may be necessary to learn complex formalizations. They argue that incremental formalisation strategies may reduce the overhead of learning a formalisation. Whalen (1995) acknowledges that a human practitioner will need to fully understand the machine's actions and recommendations for human autonomous decisions.

Seeing choices and being able to act based on available choices is an important part of being autonomous (Dworkin 1988; Bratteteig and Verne 2012a; Bratteteig and Verne 2012b). Disentangling a situation or an issue identifies or creates choices. By disentangling, the advisors support the autonomy of the callers by opening a space for action and choice for the citizen. However, disentangling does not guarantee a solution to the issue. There are calls in which the advisor cannot tell what actually happened, but may suggest possible reasons behind problems that have occurred. There are calls where the advisors cannot know for sure that his or her advice will be accepted later on by a case handler, but the advisor nevertheless provides steps to take towards resolving the issue. There is always a possibility that errors may occur, and in a sociomaterial assemblage it is not so relevant to identify whether an error originates from a human or a machine. What is important, however, is that the citizen can react and act in case of an error.

To reduce the work of citizens to fit into the norms of the governments, Borchorst et al. (2012) concluded that there is a need for governments to be more open about the requirements and potential consequences of violations. They have studied the meeting between the "socially-constituted and messy reality of identity and the rigid necessity for identification coded into governmental systems" and argue that face-to-face encounters between citizens and civil servants are important for being able to disentangle problems that inevitably will arise (Borchorst et al. 2012; Bratteteig and Verne 2012a, Paper 1).

The role of categories in computer support for structuring communication is the topic of the discussion between Suchman (1994a, 1994b) and Winograd (1994). The discussion is described in Chapter 2 and is briefly recapitulated here. Suchman argues that the categories for the communication tool impose a discipline on the communicating users as they are not defined by those who are using the communication tool. The categories express and impose a managerial agenda of discipline and control. Winograd argues that creating and using categories is inherent in all programming, and some discipline is necessary for communication to function. A point made by neither Suchman nor Winograd is that the level of structure may make a difference.

The Coordinator, the communication tool in question, was highly structured. The users had to choose a speech act category for their message before they sent it, and could not use cultural and social resources for their intention to emerge during the communication. I agree with Winograd that creating and using categories is inherent in all programming, but I argue

that one could choose to design less structure. For example, ordinary e-mail functions well for communicating, but is weakly structured. If users are forced to learn and use predetermined categories, a discipline is imposed that might challenge their autonomy if the structure does not "fit" their use. In Bowker and Star's words, "Any information systems design that neglects use and user semantics is bound for trouble down the line – it will become either oppressive or irrelevant" (Bowker and Star 1999, p. 7).

Semi-automation leaves explicit openings for human agency. Taking semi-automation seriously may be both effective and retain responsibility and autonomy. Instead of giving the impression that doing taxes amounts to doing nothing, the tax authorities can provide more help in identifying the manual tasks and provide more support for disentangling. For citizens to experience a low automation level is it important that they know about the possibility for complaining. Simulation tools can support the citizen in decision-making in their own life by illustrating potential consequences of actions or life events in terms of taxation. Easy access to overviews of one's own historical data may provide background information for understanding and acting upon the situation in the current year. This is not unlike the suggestion from Thaler and Sunstein (2008) where they argue that the customers can figure out if a service provider serves them well when the service provider gives an historical overview of the customer's use and associated costs with their service.

I end this section with a parallel with meteorology. Many years ago, when the weather forecast was read out loud in a monotone voice on the radio, staying updated on the weather forecast was considered quite "nerdy". For specific occasions, one could call the meteorologist in person and ask for a detailed weather forecast for a particular place and time. Since the advent of the web, the forecast has been published electronically, and the audience has increased. Some years ago the combined efforts of the Norwegian Broadcasting Corporation and the Meteorological Institute resulted in the new service yr.no[30], where detailed weather forecasts were made available online and in an app. The yr app is designed to present weather data from the Meteorological Institute in a graphical form that is easy to understand. Now young people check the yr app before they decide on outdoor barbeque in the park or not. I believe that a lot more people use the weather forecast today than before yr, and they use it more interwoven with their everyday activities. People plan their outdoor activities according to what yr says.

Yr does not decide for you whether or not you should go outdoors. It does not suggest that you go outdoors, when to go outdoors or what to wear, but it supports your ability to make a good choice based on the best available information. Yr supports autonomy by helping people to make better choices for themselves. It would be very interesting to see if something like yr.no for doing taxes would increase the citizens' interest in and competence in doing taxes.

7.5 Co-listening gives access to private spaces

For the citizens, doing taxes is a private activity between paid work and leisure time, taking place often but not exclusively or by definition at home. Private and possibly mobile settings are notoriously difficult to get access to as a researcher (Blomberg and Karasti 2013) . Co-listening gives access to some aspects of the citizens' activities in the home or in other

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[30] «Yr» in Norwegian means drizzle. However, the name was chosen because it was short and not occupied in the .no domain.

private settings at the time they experience a problem. Co-listening is an ethnographic technique that studies doing taxes from the citizen's point of view in the citizen's own words, only mediated by the conversation with the advisor.

Co-listening gives access to private activities that are difficult to study by other techniques. Doing taxes usually only takes place in small bursts of activity at some points of time during the year. An ethnographer visiting the home will rarely be present at the right time for observing this activity. Much of this activity will escape the radar of a survey, or is not remembered by the citizen in later interviews. In contrast, co-listening picks up the issue as it is described by the citizen close to the point in time when the issue occurs. In the actual telephone call with the advisor, we can study the issues and problems as they are described by the citizen.

Many of those citizens who call SOL are non-users of the tax web pages in general and the online self-services in particular. Co-listening gives access to non-users, or users who have tried but not succeeded. Both governmental strategies and the tax authorities want the citizens to help themselves online. In principle, the callers are expected to be less enthusiastic users of the self-services than those who do not call. Taking the callers' requests seriously pose a challenge for designing online public services.

It is difficult to conceptualise the interaction between humans and automation with the notion of "user", as the human will not necessarily be using any technology at all - and not even be aware of it. Analysing this interaction with the notion of "user", potentially misses those who are not actively and purposefully interacting with the technology. Traditional techniques for studying user interaction risk missing this aspect of non-use or unaware use.

Co-listening gives access to citizens that rarely sign up for participation in a research project. This provides an ethical dilemma for me: the callers have not given their consent to participate in my research project; however, I will argue that it is ethically justifiable to report from the issues and problems as described by the non-users themselves. Both governmental strategies and the tax authorities want the citizens to help themselves online. In theory, the callers are thought to be less enthusiastic users of the online services than those who do not call. Taking the callers' requests seriously gives the researcher access to rich descriptions of issues that will need to be accessible and solvable for all citizens online in an inclusive information society.

7.6 The work of "finding out" and "fitting in"

Doing taxes requires categorisation of persons, life events and circumstances, as well as pecuniary events. Every citizen will be fitted into the tax system and all tax-related personal information will need to be categorised. If this fit is not neat, and nicely done, the citizen may be treated unjustly or even sanctioned. Failing to categorise becomes the same as categorising as irrelevant, or as a "rejection of marginality in favour of purity" (Bowker and Star 1999).

Events in a life do not come tagged in the categories of tax. Categorisation implies understanding the boundary between the categories, and the citizens will need to recognize these boundaries. When does living together change their legal status from single to cohabiting? What kinds of costs have a category in the tax system and entitle you to a tax deduction, and what kinds of costs will not be eligible for a deduction? Some costs for refurbishing a house that is let out over a certain length of time will give tax deductions, but if

the house is not let out, these costs will not give deductions. Is this kind of income taxable, or is that kind of income tax free? To be able to infer from one case to the next, an understanding of the reasons for taxation will be necessary the citizen.

The categories of the tax system are normative rather than descriptive. There are no openings for new kinds of categories if the citizen decides that these will be a better match. This thesis has focused more on the work to fit into the categories than on working with the categories themselves. I have studied the efforts of citizens' to fit themselves into the tax system, not the tax authorities' work to produce, maintain and use the tax categories.

When a citizen's life situation and circumstances, as well as income, costs, fortune, and debts, are categorised correctly in the system, the calculations will result in the correct tax for the citizen. Citizens do this categorisation, or check and eventually correct the pre-determined categorisation from the tax authorities, their employers or others. Categorisation based on a person's own experience and advice from friends and family are common, similar to the "folk classification" of Lakoff (1987), however, this is not always enough to understand how new life events can best be categorised.

Negotiating categories is work, both fitting into categories and fitting categories to circumstances. The coloured person in apartheid South Africa who bleached her skin or spent years negotiating with the State about her racial classification was doing classification work (Bowker and Star 1999). Being allergic to onions and going to a hamburger restaurant implies negotiating the ideal with the possible and having to wait longer to get served (Star 1991). The work of fitting in means adapting to external requirements (Bowers et al. 1995).

Categorisation work is involved in all four kinds of tasks in Table 14. Checking the figures in the pre-completed tax return form involves checking their taxation category. Many of the calls left the caller with some work to fit into the tax rules and regulations, for example the caller that wanted to deduct costs for commuting before he was married. Marianne said that many call and make erroneous assumptions about whether they are in tax class II or I. Finding the right slot in the "shape sorter" includes work of both fitting in and finding out.

Trying to fit one's own descriptions and experiences into a formalism implies cognitive costs and a need for extra effort (Shipman and Marshall 1999), not unlike the challenges of classifying a bird (Lynch and Law 1999). For a novice, identifying a bird from an illustration and textual description of characteristic features in a field guide is a hermeneutic process of "bringing text and object into correspondence" (ibid, p 332). The novice needs to go back and forth between the field guide and the physical bird she is studying to work out a match between the two. In some situations, she cannot identify the bird. This mutual adaption process, now between the available pension categories and actual income, can be seen in the personal example in Section 5.2 about categorising a pension inherited from my aunt.

My analysis has identified the task of "finding out". The effort involved in finding out is also work for the citizen (Verne and Bratteteig 2013, Paper 4). It implies looking up information on the web, browsing through leaflets and personal papers, making calculations, calling SOL or other advisors, or discussing the case with friends and family. Suchmann (2007) also describes the work of finding out: when the users of the photocopier discuss amongst themselves how to interpret the instructions and make new attempts at getting their copying job done as they intended. The work of finding out occurs regularly as companion work to tasks that are made redundant by automation. The work involved in finding out decreases with experience and familiarity with the automation. Sometimes the task will result

in more work if the task of "finding out" is not done properly; one will have to redo things if the task is not well understood from the start.

Pickering (1995) uses a notion of "finding out" in a different sense than I do. The scientist developing the bubble chamber for physics experiments had to find out how it needed to be configured to produce the wanted results (1995, page 52). This process of finding out is related to how material agency works, and his notion of "the dialectic of resistance and accommodation" that drive developments forwards. My notion of "finding out" is related to abstract concepts: about which categories exist and whether a task is residual or redundant after automation.

The work of fitting in is closely related to the work of finding out. Citizens will need to find out that there is a need to fit in. Finding out and fitting in to external requirements may imply rational reasoning which are more cognitively demanding than intuitive reasoning (Thaler and Sunstein 2008; Kahnemann 2011). Mapping one's own life into categories made by others is adhering to an external discipline (Suchman 1994a, 1994b).

Shipman and Marshall (1999) argue that users often circumvent or reject formalisms which require explicit expression of structure or content. "Users are hesitant about formalization because of a fear of prematurely committing to a specific perspective on their tasks; this may be especially true in a collaborative setting, where people must agree on an appropriate formalism and the conventions for encoding information into them" (p 349). When doing taxes, the "conventions for encoding information" is important for getting a correct taxation. Errors and misunderstandings can have undesirable effects for the citizen.

Shipman and Marshal (ibid) argue further that there are many system failures because of user rejection if there is little or no match between the system and the users' work and needs However, citizens cannot reject the tax system. Doing taxes is a responsibility as a citizen in a society. I am neither arguing against paying taxes nor having to do taxes. But it is important that the requirements for doing taxes are understandable for all citizens, or at least there are possibilities for finding help if needed, so that doing taxes is not so "overwhelmingly difficult as to seem impossible" (Rose and Jones 2005). SOL offers this help.

7.7 Disentangling for designing solutions

Disentangling a sociomaterial entanglement opens up a space for action, and change if needed. In a sociomaterial entanglement where the constituents can only be analytically separated (Barad 2003; Orlikowski 2007; Orlikowski and Scott 2008; Orlikowski 2010), disentangling denotes a pragmatic approach as it is directed towards what a citizen can do to create choices to improve their own situation. In many calls to SOL, the advisor cannot know what happened, but she can give the caller some suggestions on how to handle the situation.

Disentangling has some similarities to the "agential cut" described by Barad (1999). A sociomaterial entanglement is related to our perceptions and understandings, and Barad does not make claims about any ontological reality (2003, footnote 9). In a sociomaterial entanglement of human and technological agencies, the agential cut describes a choice of how we choose to separate the agencies of humans and technologies for a particular purpose and in a particular situation. The agential cut is a constructed distinction between the human and the technological agencies, between the human observer and the observed technology. For

example, in his study of the call centre, Nyberg (2009) made an agential cut that enabled him to study the effects of errors in the database as computer agency.

Disentangling is about creating a next step to be taken, and then to see what happens. In this respect it is more like a "design move" described by (Schön 1992). Design is about seeing a situation, making a design move, and seeing the new situation, where a new design move can be made if the designer is not satisfied. The problem is identified together with its solution in a "reflexive conversation with the materials" (ibid). Disentangling gives a pragmatic solution to a tax situation or problem, and the pragmatic solutions are created, or designed. The materials for the advisor are the caller's explanation, her tools, contents of the databases, the rules and regulations and the advisor's knowledge of typical problems for the callers. However, the advisor is rarely in a position to follow up a call: to experience the outcome of a move and see the new situation.

Different advisors respond differently to similar requests or give different advice. The caller understands perhaps some of the advice, and is perhaps able to act upon it. Sometimes the advisor is unsure whether the caller is able to fill in the form to change her tax card, and the advisors rarely learn how the callers follow up their advice. The advisor makes a move or suggests a move to the citizen. Often the solution is not finalized when the call is ended, as it is up to the citizen to follow up. Pragmatic solutions are created – designed – together with the co-formulation of the problem by the citizen and the advisor inside the sociomaterial assemblage of doing taxes. The same is found by Skaarup (2011) in his study of the clients' communication with the Danish welfare agency: the problem is not given, but the solution to the citizen's problem is created together with the problem.

The rules and their interpretation are not deterministic, but the results of computer instructions are. The tax rules are in practice defined by running computer code. The consistency between legislation and computer code is created and maintained by good working practices between jurists and programmers for the development of the computer code. There will always be a potential for errors, in particular when new situations or combinations occur (Schartum 1993).

Knowing this is important for autonomy. In many cases, a citizen will need to act on her own initiative and complain if she does not agree with the automatic decisions or calculations. New events or circumstances in her life can require that she communicates with the tax authorities. The option of manual case handling when requested is very important for citizen autonomy and so is the knowledge about this option too. Active and autonomous citizens look for choices and openings, and can be expected to complain and interact with the tax authorities in their design of solutions. The citizens will need to know how they can proceed if they do not accept automatic decisions in their disfavour.

Online recommendation services give "individualised advice" based on statistics and historical data. We can imagine a similar service for disentangling tax issues, for example, "others in this situation resolved it in this way". However, coming from the tax authorities, such statistical recommendations will have an air of authority that may not be in line with the quality of the advice, and cannot be compared to a recommendations service for a book or a cinema. Instead, more loosely structured advice in the form of check lists can be helpful (Schmidt 1999). These can be connected to personal information in the database, so that for example a citizen with a D-number that marks her as a foreign worker can be reminded to request the deduction for foreign workers.

7.8 Performative effects of automation

Citizens can choose not to use online e-government services, but this option is decreasing. In Norway, electronic communication with the government will gradually become the default from 2014[31]. There is no opting out of automated tax. A pre-condition for full automation is that all relevant information is available for the computers' processing. Data may come into existence as a result of computations or inference. Data that are representations of occurrences outside of any digital sphere will need to be recognised, interpreted and reported to the tax authorities before becoming part of the processing or inference. Similarly, as we have seen, there is also data that already exist in a digital representation, but which are not reported automatically to the tax authorities.

In their databases, the tax authorities normally have a digital representation of the tax-relevant data for a citizen. However, I have shown that many occurrences in a citizen's life are not captured by the tax authorities' computers, at least without a delay. The digital representation of a citizen within the tax authorities' databases is, in Suchman's words, as if the tax authorities are viewing the citizen "through a very small keyhole" (2007). Analogously, the tax authorities only have access to the information that is reported to their databases. This is not necessarily everything there is to say about a citizen. MacKenzie warns against the machine version becoming canonical and reality secondary (2001).

As a set of rules and regulations, tax is a model, a formal system, more than about life itself (Kallinikos 2012). The tax system functions as intended, in that all citizens have to relate to and define occurrences in their life within the categories of the tax rules and regulations, and pay their taxes. This is no surprise; tax is a system of discipline and is designed to work this way (Suchman 1994a; Winograd 1994). Some citizens do tax planning by adapting their economic dispositions and civil status to achieve tax benefits, and to a certain degree, this is encouraged by the government. Young citizens are encouraged to set aside their savings in a special home savings bank account for young people[32].

Legislation is performative and is meant to be so, to change the citizens' behaviour in a desired direction. In a wider perspective also, legislation has performative effects: the Norwegian Tax legislation is designed to distribute wealth among the population. There are examples of non-linear taxation that will make wealthy people pay more taxes[33].

In the rest of this section, I discuss possible performative effects of the *automation* of tax. Firstly, I discuss if we can see performative effects of the weaker kind defined by Leonardi (2012). In Leonardi's interpretation of performativity, the automation of tax is performative in that it does things without human intervention. That it calculates taxes and issues penalties is trivial, this is what it is designed to do. It also collects money into the Norwegian National Treasury.

Effects of the stronger interpretation of performativity will imply a convergence of "information artifacts" and "social worlds" (in Bowker and Star's terms (1999)), or that reality is co-constituted together with the apparatus that represents it (in the terms of Pickering (1995), Barad (2003), Orlikowski and Scott (2008), Boell and Cecez-Kecmanov

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[31]Such changes to the bylaw on e-government was passed in February 2014, see
http://lovdata.no/dokument/SF/forskrift/2004-06-25-988?q=eforvaltningsforskriften

[32] For an explanation in English, see for example:
https://www.dnb.no/en/personal/savings-and-investments/saving-account/BSU-savings.html

[33] A discussion on whether this ambition works as intended is beyond the scope of this thesis.

(2012), and MacKenzie (2006)). Performative effects occur when reality emerges as more in line with the preconditions for and representations of it in a sociomaterial entanglement of tax rules and regulations, computer calculations, organisations, databases etc. MacKenzie (2006) concludes that performativity has three virtues. These are:

1. When confronted with a theory or model, ask: Is it accurate? "What will the use of the model *do*? " (emphasis in MacKenzie (2006))
2. Because performativity not just resides in "big ideas" but also in "apparently small technicalities", the notion reminds us to pay attention to these.
3. The most important is: What sort of a world do we want to see performed?

In the following, I will adapt these and use them for a discussion of possible performative effects in the strong version of the sociomaterial assemblage of taxes.

7.8.1 Is it accurate? What will the use of the model do?

MacKenzie was working with economic theory. Accuracy will be important for economic models, but is not so relevant for tax rules and regulations, which are meant to be normative more than descriptive. We can instead relate accuracy to the representation of a citizen in the databases of the Tax Administration. For correct treatment, the personal data need to be a most beneficial representation, which is also representative, of the citizen in the databases. His next question about what the model will do is more relevant, and I will rewrite this virtue to be "What will the automation of tax do?"

The observation that the psychiatrists were using terms from the DSM even in conversations between colleagues, although they did not believe in the medical explanations indicated by these terms (Bowker and Star 1999), may have a parallel to doing taxes. The tax categories of deductible costs, kinds of income, civil status etc. do not necessarily reflect the citizens living practice, but function as an external tag that needs to be put on when doing taxes. On an individual level, only what can be seen through "the narrow keyhole" is what exists, and the digital representation of the tax authorities becomes canonical.

What will the effects be on our autonomy if tax becomes less semi-automatic and more fully automatic? I located the automation of tax on Cummings' (2004) level 4, but the access to lodge a complaint for manual case handling is not on Cummings' list, and disturbs the picture. Access to individual discretionary case handling is important in a well-functioning democracy (Lipsky 2010). A precondition of fully-automated tax is that all relevant data is digitally available and all decisions will be pre-determined. Will there be less access to discretionary judgements by human case handlers? Weizenbaum (1976, p. 258)) warns against the "imperialism of instrumental reason".

Of more far-reaching concerns, a performative effect of automation can be that citizens do not learn anything about doing taxes. There is no need for the citizens to involve themselves in tax issues, not in the personal aspects of taxes nor the political aspects. The dystopic "disinformation society" will emerge as a performative effect of automation. The information society may turn into a disinformation society.

The Federal Aviation Administration has released a notice[34] that instructs pilots to spend less time flying on autopilot and more time flying by hand (Carr 2014). The FAA had collected evidence that the pilots had become too dependent on autopilots, with consequences for the pilots' ability to keep the plane and its passengers safe. More airtime flying by hand

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[34] Federal Aviation Administration, SAFO 13002, January 4, 2013.

will keep the abilities of the pilots sharpened. An analogue to citizens' ability to do their taxes is to stimulate them to focus more of their attention on doing taxes.

7.8.2 Pay attention to the apparently small technicalities

Both the big sociomaterial entanglement and the little detail may contribute to performativity. Pickering's version of this is the observation that the mangling of human and technological agencies operates at a detailed level not usually accessible to researchers. Reconfiguring the apparatus, that is "delicate material positioning", is a way of influencing performativity (Pickering 1995). Technological detail matters, another design may make a difference. Design of information systems entails designing others' futures (Simonsen and Robertson 2012). Design is a way of reconfiguring the information system apparatus (Boell and Cecez-Kecmanov 2012).

I will illustrate the influence of apparent technical detail with a brief recapitulation of "A parable" by Edsger Dijkstra (1982), one of the founding fathers of computer science. The story goes like this:

A newly established railway company decided that to save money only 50% of the cars should be equipped with a toilet. After some time, complaints poured in. An investigation revealed that the shunting yard had not received this decision and treated the cars as equal, as a consequence trains without toilets were sometimes assembled. In order to solve this problem, information was associated with each car whether it contained a toilet or not, and the shunting yard was instructed to compose trains with an equal number of cars with and without toilets. This created logistical challenges and practical difficulties for the shunting yard, but they managed. However, complaints still poured in. A new investigation was carried out and revealed that it sometimes happened that all the cars with toilets were assembled in one half of the train. As a result, the shunting yard was instructed to compose trains where cars with and without toilet should alternate. This provided more severe logistical challenges for the shunting yard, but they managed again.

The complaints continued. A new investigation revealed that the distance between toilets could be almost three car lengths. Sometimes passengers had to go far when in a hurry. The solution was to assemble the train with all cars with toilets in the same end, so that the distance between toilets became the same. The cars with toilets needed another piece of information associated with them that told in which end the toilet was located. Assembling cars in line with the new instructions proved to be an even greater challenge for the shunting yard, in particular they needed more turntables to turn more cars around.

The story goes on with further developments in management decisions, instructions to the shunting yard, cars and the practical work at the shunting yard, but I end it here. The story illustrates that apparently small technicalities can give complex and far-reaching consequences. The changing relationships between data structures and work organisation is the "dance of agency", described as "the interlinked agency of humans and machines and the socio-material conditions, which are both context, and outcome of that agency" (Rose and Jones 2005).

Design begins with a design vision (Löwgren and Stolterman 2004). I have suggested design improvements and alternative design suggestions that may make doing taxes more accessible to the citizens even in the light of automation. My design vision in a democratic information society is to make room for coherence, choice and action for the citizens, and stimulate learning about tax.

7.8.3 What sort of a world do we want to see performed?

With this question MacKenzie ends his book (2006). The question indicates that we have choices – that performativity does not in any sense give deterministic effects. MacKenzie does not, however, provide any suggestions on how performativity can be harnessed. We cannot control performativity, only at best, influence it by nudging people's behaviour with conscious design.

Democracy is about keeping an open and informed debate about important issues in society. Instead of citizen passivity with little background for choice and action emerging as performative effects of automated tax, an answer to the question can be that we want a society with knowledgeable citizens able to make choices and act upon them, both at a personal and a societal level. Individual considerations by human discretionary judgments will have to co-exist with automatic decisions. Engaged and knowledgeable citizens can be a performative effect of a design for the automation of taxes. Designing for citizen autonomy can be a move in this direction.

8. Conclusions

In this thesis, I have presented a critical research study of the relations between humans and machines from a sociomaterial perspective in the context of automated taxes. Tax authorities, citizens, automation, tax rules and regulations, and online services are seen as entangled in a sociomaterial assemblage. My research questions centred around three topics:

1. The relationships between humans and automation
2. Automation design for supporting citizen autonomy
3. How automated tax functions for the citizens and for society

The case study reported from the calls to the tax information call centre (SOL), with a focus on the problems as experienced by the caller. The analysis is done on two levels; the first-level analysis extracts what is problematic for the caller, and the second-level analysis identifies the manual tasks left for the callers and the citizens in general as residual tasks outside of automation. Citizens doing taxes are seen as the meeting between the formalised world of tax rules, regulations, forms and items, and the fluid events and circumstances in the lives of the citizens.

The unit of analysis in my research is the call. The calls are presented on an axis of challenges between the citizen and a correct application of the tax rules. Seven types of challenges are described:

1. Circumstances in the life of the citizen. The citizen has a complicated or demanding life situation, or is (temporarily) unable to use online services for tax tasks. Changes in one's life situation can trigger a need to update the registers of the tax databases.
2. The "shape-sorting box". Identifying and finding the right category for incomes, estate, capital and deductions that correspond to items in forms, as well as the right name for tax-related forms, documents and processes.
3. Using the online services. Callers do not find information on the web pages and the online services are difficult to use for many callers.
4. Internal structures within the tax organisation. Many callers ask questions that are redirected to the Tax Collector, a municipal unit. Callers also ask for information or services that are not available at the time of the call.
5. Technical issues and anomalies. Certain built-in defaults and security measures can appear to the caller to be technical errors. Information in the registers can be outdated. In addition, user errors can occur and be indiscernible from technical errors originating from the tax authorities' computers.
6. Manual tasks and documentation. Some deductions need to be claimed explicitly and possibly documented manually. Missing values need to be filled into the tax return form.
7. Laws and regulations. The rules and regulations need to be explained, interpreted and adapted to new situations for the callers.
8. Interactions with and between employers, municipalities and other public agencies may complicate the situation for the citizens.

A conclusion that emerges from the first-level analysis is that the citizens call for the tax advisors to help them with finding out and fitting in to the tax rules and regulations. In addition, they call to confirm their own understanding out of a desire to do everything

correctly and in fear of sanctions. The advisors explain tax topics and provide work-arounds and disentangling to open a space for action and choice for the callers, in particular with their relations to other public or private agencies.

The second-level analysis identifies four kinds of tasks that together make up doing taxes: redundant and residual tasks, and new tasks inside and outside automation. Redundant tasks are covered by the automation; however, many callers want confirmation that they do not need to do these. In addition to residual tasks that are not automated, new manual tasks are introduced by the automation. Some result from overriding defaults that are built into the automation, and some are genuinely new tasks outside of the old task area that stem from the way the automation is constructed. The companion task of "finding out" similarly emerges as a manual task.

My analysis shows that callers need expert help in identifying solvable issues and finding solutions. The solutions to their issues and problems are designed hand in hand with the formulation of the problem. Experience with digital technologies plays only a minor part in understanding and acting in the sociomaterial assemblage of doing tax.

This thesis argues both theoretically and practically that the design of the automation determines which tasks are left for the citizen. A different design would leave a different set of tasks for the citizens to complete manually. An alternative design for technology support for doing taxes for young people is presented.

Tax in Norway is semi-automatic, rather than automatic. The sum of the automated and the manual parts make up a whole. Taking semi-automation seriously implies providing support for the citizens to understand their tasks. These are often residual tasks, and a prerequisite to identifying the manual tasks is to know something about the automated parts. I suggest a conceptual framework for an alternative approach to semi-automation that will let the design of coherent and understandable human tasks be primary and drive the design of the automated parts. Design for human autonomy implies a focus on creating coherent and understandable tasks for a human rather than pushing the limits of what can be automated.

Automation without the opportunity for seeking expert help implies that all citizens are able to interpret and match rules and regulations to their individual life situation without help from those with expert knowledge of these rules and regulations and how they are applied. It also leaves the task of disentangling problematic situations to the individuals themselves. They need to understand the boundaries of the automation by themselves in order to identify the residual tasks, and address error situations, without any individualised help from those who are familiar with this particular automation.

Automation without access to manual help challenges the autonomy of those who need help. A public agency that is not willing to talk to its citizens presents an impersonal façade, offering little opportunity for citizen learning. If citizens cannot find out by themselves, they risk incorrect and unfavourable taxation without knowing why. In a democracy, the citizens need to know why decisions are made, and they have a right to complain and argue for their case. In automated case handling, it is important that there are openings for the citizens to look out for errors and irregularities and react if necessary. Erroneous automatic decisions can never be ruled out. Citizens will benefit from being actively critical to automatic decisions. Automatic decisions with undesirable consequences for a citizen who is not aware and does not complain are a threat to their autonomy.

Certain theoretical concepts have been developed in my work. The notion of *disentangling* is suggested to open a space for action and change in a sociomaterial assemblage, and is used

for finding a way to change undesirable conditions that negatively influence a citizen's autonomy.

Autonomy emerges as a performative effect of the sociomaterial assemblage. This thesis has identified different forms of relational autonomy based on advocacy relations. A citizen who gets sufficient explanation to handle his or her tax issues without further help from the advisor, experiences *do-it-yourself autonomy*. She can benefit from learning to use online services. In contrast, *duke autonomy* applies to a citizen who receives help from the advisor to avoid negative effects on his life and economic situation. The caller is served like a duke if there is a risk that he is unable for example to change the basic information of his tax card himself, and the advisor does this on his behalf, thus improving his economic situation.

SOL's log of the calls silences many of the issues that the callers tell the advisors. I have identified two kinds of silencing: *priority silencing* happens when more than one category can be used to describe the call, and the advisor chooses one that focus on the advisor's own actions. *Ontological silencing* occurs when there is no category to describe the caller's issue, from the caller's perspective. New categories will need to be made to overcome ontological silencing, different politics and practices for the categorising will be necessary to overcome priority silencing.

My research has built upon several long-standing topics in the field of CSCW: the nature of work, technology use, employing ethnographic techniques to study technology use, and how categories function in actual use. I have seen the call as a way to understand the private work of the citizens at home, at the work place, or in mobile settings where they do their taxes. I have studied citizens' activities when doing taxes as "work", and thereby expanding the notion of "work" used in the CSCW field to encompass civic work: that kind of work the citizens do qua citizens. This work is different from paid work in that it is done as a part of taking responsibility as a citizen in a democratic society.

When particular issues are in focus, other issues will inevitably be pushed into the background. My work has focused on the citizens' and their relation to tax at the expense of other topics such as internal communication within the tax organisation, or between the tax authorities and other public and private actors. Neither tax evasion nor economic cost-benefit concerns have been topics in this study.

The effects of automation are difficult to study, as many who are affected by it are not aware that they are, or how it affects them. I argue that co-listening is an ethnographic technique to access private and remote field sites for rarely occurring events. In particular, co-listening gives access to non-users of online services, and gives a rich understanding of why these may be complicated for the non-users. Because citizens are encouraged or coerced to do their taxes online, taking the callers' requests seriously gives the researcher access to rich descriptions of issues that will need to be solvable online for all citizens in an inclusive information society. That people call with good reasons provides challenges to the design of online information and services.

8.1 Future research

Future challenges for the design of online public services are both practical and theoretical. The practical challenges are concerned with providing solutions that benefit from automation and at the same time support the citizens' autonomy and competence of the domain area, both for individual and democratic reasons. As long as there is a division of work between the

citizens and the automation, citizens will need support for finding out which tasks are theirs to carry out. I argue that different designs of automation are possible and will directly influence which tasks are left. I have suggested a conceptual framework to analyse how automation influences a task area: how it changes old tasks and introduces new ones. Further research will be necessary to develop this approach. In particular, designing "yr"-like technology for doing taxes would be interesting.

It would have been interesting to follow up co-listening sessions by getting in contact with the caller after the call. A participatory design approach where the callers are recruited to design for autonomy would be both interesting and challenging. Techniques such as cultural probes to access rarely occurring events such as when a tax issue arises in the life of a citizen, or designing workshops with citizen participation, could be fruitful means of involving the citizens directly in the design.

In this thesis, I have aimed at explaining why e-government services can be experienced as difficult to use. This opens up methodologically and thematically for e-government research to incorporate studies of how automation and online public services function in practice for its citizens. Such research can have an impact on the potential success of e-government, but also have wider implications for citizen autonomy.

Seeing the development of public services as merely a technical endeavor aimed at efficient data collection, will make us blind to possible performative effects. Potentially, a performative effect of the automation of taxes could be citizens with very little competence about taxes, both on a personal and a societal level. The residual tasks may be under pressure because they become "squeezed" from the combined forces of a drive towards more automation and little experience among the citizens of the residual tasks. Decreasing or removing the residual, manual tasks will stimulate performative effects towards even less knowledge about tax issues.

Another performative effect can be a society where sources for individual discretion are ruled out and the tax rules will have no options for individual case handling. However, performative effects are not deterministic, and there is no recipe to harness performativity and direct performative effects. Instead there are approaches we can take that will encourage a move in a wanted direction.

In a democratic society with knowledgeable and autonomous citizens, some understanding of the machinery of taxes is necessary for citizens' personal space for actions and choices – for autonomy – and for the underpinnings such understanding makes for a democratic society. Understanding and experience grow from the practice of doing taxes, and not all processes related to tax should take place automatically. The challenge is to combine automation with engaging the citizens. Reconfiguring technological agency is a way of stimulating performativity. Different design choices will give other sociomaterial approaches that will make a difference, but there must always be openings for human help.

Participatory design is one approach that involves those who are affected by the technology to have a say in its development, and is therefore an approach that may harness performativity towards wanted societal and individual effects. We need open discussions of what kinds of society, citizens and competences are wanted.

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