Autonomy and Automation in an Information Society for All

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Abstract. A key challenge in an inclusive Information Society is to understand the relationship between autonomy and automation: Does the automatic system increase human dependency on technology and decrease human autonomy or does it strengthen human agency and human autonomy? Such an approach assumes that an equilibrium or balance between autonomy and automation can be found. We explore this issue in three vignettes on the use of digital technologies in public sector service delivery and discuss how the focus on finding equilibrium may conceal the complex and multiple interactions between autonomy and automation. We identify two challenges that influence our thinking about autonomy and automation: the need to go beyond technological instrumentalism and the need to rethink human autonomy. Lastly, we present our relational perspective on autonomy, *autonomy-in-relation*. Human autonomy, we conclude, is enacted in different configurations of people and things.

1 Introduction

In "An Information Society for All", the Norwegian Ministry of Government Administration and Reform (2007) presents its white paper on the role of information and communication technology (ICT) in Norwegian society. The white paper presents ICT as a force, a facilitator, a capacity builder, and services provider, and states that the design of digital technologies, in particular in the public sector, should be based on the principles of universal design, i.e. design that does not create new or extensive barriers to people with special needs. The Soria Moria Declaration (the political platform of the current Norwegian government) mentions on this point:

> "The needs of the individual shall be focal as concerns both the substance and organisation of welfare provisions. The services shall as far as possible be adapted to the needs of the individual. Through frequent and active dialogue with individual citizens, public authorities shall ascertain that the provisions made match the needs of the recipient" (Regjeringen: Soria Moria, 2005, Ch. 11. Renewal and Development of the Public Sector: 52).

The focus on the individual citizen and user of public sector services is further developed in *eNorge 2009* (Fornyings- og administrasjonsdepartementet 2005), a policy paper by the Norwegian Ministry for Government Administration and Reform, which addresses the communication between 'citizens' and the public sector. The role of ICT is presented in this policy document as a 'powerful tool' to simplify communication and to free up resources for a stronger social service provision (p. 24). An example of this role of ICT in the public sector can be found in *Samspill 2.0* (Helsedirektoratet 2008), the national strategy (2008-2013) for ICT development in health and social sector in Norway by the Norwegian Ministry of Health.

The increasing use of information and communication technology for coordination and collaboration is expected to improve the patient's experience with the health care sector. At the same time, increased use of ICT, through e.g. electronic patient records and electronic prescriptions, will supposedly save the public sector 300 million NOK[1] over 15 years.

Norwegian policy documents present a picture of how digital technologies are expected to contribute to *An Information Society for All* and what is needed to allow individuals to participate in such a society. The focus on the individual is consistent with the New Public Management approach in which "responsiveness to consumer preferences is the main technique for improving public services and increasing organizational effectiveness and mission accomplishment" (Aberbach & Christensen 2005: 226). This approach redefines the notion of citizenship from one that focuses on the wellbeing of society as a whole, to one that focuses on individual interests and individual rights (ibid). An inclusive information society thus refers to a society in which the fair and equitable participation of individuals in the access and use of information and communication technologies (ICT) is secured. The accessibility of ICT includes the ability to operate the technology in a meaningful way as well as the utilisation of the information provided by and generated through the use of ICTs. Secondly, the policy documents express a technological instrumentalism and utopianism when it comes to the role of information and communication technology as a tool to provide greater and more efficient access to information and services.

Human beings have always used technologies to enhance their autonomy. With the arrival of personal digital technologies, however, we see increased possibilities for digital equipment to act as prostheses for physical and cognitive human functions, such as technologies embedded in the body (e.g. pace maker) or the environment (e.g. sensors and alarms). This can be perceived as an increasing automation of human activity, which can both enhance and diminish human autonomy. Dependency on technology increases fear of loosing individual autonomy. This is even more so if we experience technology as autonomous, when technologies seem to express an agency of their own (Winner 1977; 1986), The Information Society's focus on the *access* and *use* of new digital technologies often results in technology designs that enable simplified interactions with digital technologies, while the more complex automations move to the background. This contributes to the conceptualisation of such technologies as neutral tools. This instrumental perspective on technology considers only users as agents: users give meaning to the technology and are able to use the technology to enhance their autonomy. In reality, the obscurity of automatic systems may shift the interplay between autonomy and dependency in fundamental ways and may even hamper the conditions for human agency and autonomy.

The focus on information and communication technology for an inclusive information society addresses a fundamental and far-reaching challenge to public and business uses of ICTs, namely the delegation of individual and social responsibility to technical systems. This concern guides a new research project '*Autonomy and automation in an Information Society for All*'[2]. The principle question we ask in this project is about the relationship between automation and human autonomy. We assume that automation can both strengthen and threaten human autonomy. The specific questions we want to explore in our research project are the following:

1. What is human autonomy in an inclusive information society and how do gender, age, ethnicity, and digital skills level shape understandings of human autonomy?
2. How do digital automation and human autonomy inter-act and intra-act with each other and are different interactions possible or desirable?
3. What are the designs and design criteria that enable flexible (re)configurations of automation and autonomy?

There are two main challenges we need to address in our project. The first one is the need to rethink human agency in a society in which public sector service delivery is increasingly based on automated systems and procedures. The second challenge is the technological instrumentalism underlying the policy documents that guide new initiatives for further automation in the public sector in Norway. In this paper we will explore these two challenges with the aid of three vignettes, which are representative for the three case studies that will form part of our research project. In the following section we will first present a discussion on the notion of human autonomy. In section three we will present and discuss three vignettes that challenge conventional understandings of human autonomy. In particular, we will explore these vignettes in a discussion of the relationship between automation and human autonomy. In section four we will further address the two main challenges we have identified and in section five we will present our concluding remarks and we will briefly present our future research.

2   Human autonomy in an 'Information Society for All'

In this paper we explore human autonomy in an information society that is characterised by increasing automation. Modern conceptions of human autonomy are based on Immanuel Kant's moral theory, in which autonomy is perceived as the self-imposition of the will by rational humans. According to Kant, a human is autonomous if one can act on one's own rational, and therefore universal, moral laws, free from external force (1997). Autonomy is understood as central to the development of free citizens and a just society and can mean different things in different contexts. For example in the health care sector, autonomy is often equated with informed consent, while in liberal political theory, autonomy is seen as an individual right (Mackenzie and Stoljar 2000).

Under the umbrella term of *relational autonomy*, Catriona MacKenzie and Natalie Stoljar (2000) discuss five feminist critiques of the Enlightenment notion of autonomy: metaphysical, care, postmodernist, diversity, and symbolic, which have resulted in different refigurations of human autonomy:

- Metaphysical critiques focus on the notion of 'autonomous man' as an individual, who can exist outside a social context. If the notion of autonomy presupposes individualism, we should reject autonomy. Mackenzie and Stoljar (2000: 7-8) differentiate between four possible positions within metaphysical critique, which correlate to four different understandings of individualism: i) that agents are causally isolated from other agents; ii) that an agent's sense of self is independent of the family- and community relationships in which one participate, iii) that an agent's essential properties are intrinsic, and iv) that agents are metaphysically separate individuals.

- Care critiques argue that the traditional notion of autonomy is a masculine notion, devaluating women's experiences and the value of the their relationships, such as love, care, friendship, and loyalty (ibid: 8-9). These critiques do not reject the notion of autonomy, but reconceptualise it. For example, Evelyn Fox Keller sees autonomy as a kind of competence and developed the notion of dynamic autonomy, in contrast to the traditional – static – notion of autonomy. Dynamic autonomy is a competence that enhances the notion of self and presupposes relations and differentiations with others (ibid: 10).

- Postmodern critiques of autonomy are based on different theoretical perspectives: psychoanalytic theory, Foucauldian theories of agency and power, and feminist theories of difference and otherness (ibid: 10). For example, Kant's notion of 'autonomous man' is based on the idea of a 'true self', unaffected by discourses and power.

- Diversity critiques are related to post-modern critiques on the traditional notion of autonomy. Diversity critiques argue that an individual belongs to different groups; thus challenging the assumption that the individual is a unified self. Rather the identity of an individual is 'intersectional' and multiple (ibid: 11-12).

- Symbolic critique of autonomy focuses on the ideal type of 'autonomous man' and its notion of self-sufficient independence, which underlies theories of autonomy (ibid: 6). Lorraine Code (2000) is the main proponent of this type of critique of autonomy. Code argues that even thought contemporary scholars have challenged the idea of the conception of the rational self that underlies modernist understandings of autonomy, our discourses still reflect the idea of "'autonomous man' (…) an iconic figure, emblematic of an unrealistic imperative towards self-reliant self-making" (p. 183). Code sees here also a gradual alignment of autonomy with individualism (1991: 78). It is this autonomy ideal that "permeates and legitimates the discourses of impersonal mastery that trade on an image of autonomous man as ubiquitous, invisible expert-authority, who stands above the fray to view "from nowhere" the truths the world reveals to a mind prepared" (p. 185). Such epistemic autonomy, argues Code, legitimates autonomous man to claim responsibility for Others who are not able to know their own interests. Code proposes ecological thinking (2000; 2006) to 'decenter' Kant's autonomous man. Ecological thinking, based on both a literal and metaphorical understanding of ecology, examines the potential of epistemic and ethicopolitical practices to produce habitats where people can live well together, locally and globally, and respectfully within the physical and natural world" (Code 2000: 199). Such being in the world reconfigures the notion of autonomy; from the autonomous rational man to autonomy as an effect of the way we inhabit the world.

Mackenzie and Stoljar argue that rather than to do away with the notion of autonomy, as some critiques seem to imply, we need to refigure autonomy in order to address the complexity of both the autonomous agent and the social and historical context in which the agent is embedded. Mackenzie and Stoljar (ibid: 21-22) formulate two crucial concerns of relational approaches towards autonomy. Firstly, the need for more detailed accounts of the 'autonomous human' as 'agent' and how such accounts can contribute to our understanding of autonomy. As example, the authors mention the conceptualisation of the autonomous agent as emotional, embodied, creative, relational, etc. Recognising agents as psychically and socially different from others calls, they argue, for a reconceptualisation of notions such as self-realisation, self-reliance, identification, etc. A second concern is to analyse how oppressive socialisation and social relationships can impede autonomous agency. For example, the agent's ability to make autonomous choices can be impeded by restrictions that hinder freedom, but also by social norms, such as institutions, relationships, and practices that limit an agent's significant options available to them.

2.1 Dependency/autonomy and ICTs

In "*Rethinking ICTs: ICTs on a Human Scale*", 'Information Society' critic Cees Hamelink (2006) contemplates the 'mantra' that *knowledge is good* and argues: "Technology has rarely ever been invented, developed and applied under the guidance of normative, moral principles. The ability to engineer was and is – often in combination with commercial or military interest – the essential driving force" (p. 390). Hamelink's discusses three characteristics of humans, i) dependence on each other, as we are social animals, ii) vulnerability, as we have only limited control over our physical and social environments, and iii) uncertainty as we are continuously confronted with unpredictable outcomes of our own actions (p. 391-2)[3]. These characteristics can be balanced by our moral claims to autonomy (dependency), integrity (vulnerability), and security (uncertainty). The question Hamelink poses is the following: "What does seeking balances between dependence vs autonomy, vulnerability vs integrity and uncertainty vs security mean and imply for the human scale in ICT development, innovation and application?" (ibid).

Hamelink expresses a particular concern, namely the implications of the increased use of ICTs for human autonomy. In addition to the two concerns we identified above, we propose to add this concern as a third concern for our relational approach to autonomy, namely the implications of increased use of ICTs for our understanding of human autonomy in general and for the specific ways in which automation strengthens or threatens human autonomy. We would like to address this concern in the form of an exploration of Hamelink's dependency/autonomy scale in three vignettes. These vignettes represent the themes of the three case studies that are part of the research project 'Autonomy and Automation in an Information society for all' and will help us address the complexity of the relationship between autonomy and automation.

3 Exploring autonomy

As we described above, autonomy is often understood as self-governance, the capacity of an individual to be directed by one's own informed rational considerations. Critiques on this understanding of autonomy are based on the understanding of the social embeddedness of the individual, emphasizing the role that social dynamics (culture, religion, ethnicity, class) and power structures play in the construction of human autonomy (Christman 2004; Mackenzie and Stoljar 2000). In this section we will present and discuss three vignettes that will help us discuss human autonomy in relation to digital technologies.

3.1 Vignettes

3.1.1 Vignette I: The income tax return

The first vignette is based on a commentary in one of the main newspapers in Norway[4] on the pre-filled income tax return or *forhåndinnfylt selvangivelse*:

> Handing in the income tax return form is something many Norwegian taxpayers wish to avoid – and in 2008 this dream came true. The Norwegian Ministry of Finances suggested in January 2008 that the income tax return form could be handed in automatically, without any work by the tax payer. For many people this announcement came as a relief. In 2008 (like earlier years) the majority of Norwegian taxpayers handed in their tax return forms via Internet or as a SMS. These technologies were used

only to confirm that the taxpayers accepted the information that the Tax Authorities had collected about them. By the end of April, 2008, the deadline for submitting the income tax return, 1.387.070 of the 2.098.121 taxpayers had confirmed their 2007 income tax return forms (i.e. accepted without any changes); 830.221 did so via the Internet, 191.395 by telephone, and 365.454 via sending a SMS. We assume that a large part of these taxpayers did not seriously check the information in the prefilled form in order to establish that this information was correct. We also assume that they were happy that the process of filing a tax return had become as simple as pushing some buttons on a web site or on a mobile telephone. In 2009 the Norwegian Tax Authorities made it even simpler for the tax payers – with our so-called *silent accept* we do not have to do anything to hand in the tax return form.

3.1.2 Vignette II: Patient privacy

This vignette is based on an article published in a Norwegian daily newspaper that discussed the electronic patient record. The article reports on a meeting of one of the Norwegian political parties. One of the topics discussed during this meeting was the government's privacy policy. The party called, among other things, for an anonymised electronic patient record consisting of only crucial medical information about the patient. The second half of the article is about the experience of one patient with the existing electronic patient record, which is not anonymised and which contains information on all contact the patient has had with the medical services in Norway.

"M. experienced a patient nightmare. She has been admitted several times to a psychiatric ward and suffers from serious depressions, post-traumatic stress syndrome, eating disorders, self-mutilation, and abuse. It turned out that all health professionals who are in contact with her at the ward can log-in and read her patient record. She realised that even the night shift and the physiotherapist had read about al she had been through"[5]. This is how the article on M's experiences with the electronic patient record begins. M. requested a report on who had accessed her journal and complained to the Norwegian Board of Health Supervision. She felt that too many people had access to too much information, including her physiotherapist who accessed her record 23 times. The physiotherapist received some critique, but was not reprimanded. M. was not satisfied with that. The problem is the patient record itself, she argues. She supports a new initiative on electronic patient records in Norway in which only the core content of a record will be available to all health personnel. This initiative is not yet government policy. By talking publicly about her ordeal, using her own name and medical history, and including her picture, M. hopes to support the case for patient privacy.

3.1.3 Vignette III: Telecare

The last vignette is an extract from the article: Embodying autonomy in a Home Telecare Service (López & Domènech 2009). The empirical material comes from their 12-month study in a Catalan Telecare Service. In the following fragment they interview Mrs. Paquita, the user of a personal alarm (pendant)[6]:

Interviewer: Are you used to using the pendant?

Mrs. Paquita: Well, no, no, no, no. I'm not used to it at all. Well, I mean, sometimes, sometimes, I wear it because they told me to try it, to see how it worked. But I never think about it. Since I don't need it, I don't think about it. And, sometimes I remember,

and, I'm sorry, but I think: 'Look, now I have to bother them? Come on! I'll do it tomorrow, I'm fine now!' Well, one night, I thought I needed them, but I stopped myself. I thought: 'it will pass, it will pass, it will pass'. I didn't know what was happening to me, something very strange, anyway . . . I was in bed; I started to breathe heavily, like I was going to suffocate. I wanted to get up but I couldn't. I couldn't get out of bed, I couldn't move. And so that, when . . . I have it on the night stand, so that right away, just by doing this I'm able to touch it. But I thought, it will go away, it will go away and as in fact it did go away, I didn't call. If I call my daughter, if I call her, it's easier for me, because, my daughter's telephone number I know by heart, but what if I'm too nervous and I don't remember it. 'Don't mess up'. And since I think it was 4 in the morning, if I called them (she says weakly) . . . but anyway, what happens if they come and nothing is wrong?, if it has already gone away? Don't worry, don't worry, no, don't call. No, and I didn't call (laughs) and then Joan (the volunteer who twice a month visits her) gave out to me. Joan: Yes, that happens rather often, there are people who call a lot, and people who don't call so as not to bother, and that is not right . . . Mrs. Paquita: It's that I'm really sorry to be a bother (laughs).

3.2 ICTs on a Human Scale

Hamelink argues that the "human scale can be found in the equilibrium between the factual state of dependency and the moral claim to autonomy" (p. 391). In its not difficult to see how such an 'equilibrium' might be constructed in the case of the automated income tax return and the autonomous taxpayer (Vignette I). The Norwegian Tax Authorities have for years made a huge effort towards making the processes of collecting tax data from various systems and of calculating taxes into automated processes. This effort has succeeded and makes it possible for the tax case handlers to change their routines from checking taxpayers' forms to focus on investigating economic crimes. As a consequence also the taxpayers' tax calculations has been automated, which is a relief to the taxpayers who do not feel comfortable in calculating their tax manually. Ironically, the earlier paper forms encouraged taxpayers to fill in the numbers and calculate the tax, as the effort to understand the form resulted into making the calculations. The calculations offered the possibility to anticipate the tax return and also to calculate if the taxpayer owed some tax or would get some refund from the Tax Authorities. Today's easy-to-use digital solution, however, does not encourage such calculations.

As some of the authors of this paper also pay income tax in Norway, we contemplate the consequences of filing our tax return:

- without necessarily knowing that you do so;

- without knowing how the tax you will pay is calculated; and

- without knowing whether the information that forms the basis for the calculation is correct.

Norwegian taxpayers trust the government to calculate the tax return most beneficial for each of them. However, automation also means that they will not be able to know any more what the tax calculations mean for their personal economic situation and in what way their tax payments contribute to society at large. This may lead to ignorance about how each taxpayer contributes to the common good and may result in an increasing interest in reducing personal income taxes, which may ultimately change the Norwegian model of the social-democratic state.

From an informatics perspective we argue that the suggestion of a fully automated tax return is in conflict with the vision of Norway as an 'Information Society'. Norwegian policy documents envisage an 'Information Society' as a society in which the needs of the individual citizen and user of public services are central. It is not difficult to imagine a solution that may restore a 'balance' between autonomy and automation. Today's digital technologies can provide solutions that will contribute to giving the individual tax payer a better overview of his/her own economy as well as a better understanding of how their income tax return is generated, including the underlying argumentation.

In Vignette II we see a different situation. On the one hand we have an electronic patient record that contains information on all the contacts a patient has had with the health care services. The electronic record enables health personnel efficient and timely access to information when dealing with a patient. Electronic patient records are also perceived as saving people's lives as less medical mistakes are made (e.g. Anderson & Baker et al, 2006). On the other hand we see a patient who argues that too many people working in the health care sector have too much access to too much information. The tension is between the need for effective information exchange between health personnel and "the right to control the circulation of personal information about oneself, freedom from unreasonable interference in one's private life and the right to the protection of personal data against misuse or unjustified publication" (Weitz et al. 2003: 294). M. seems to have experienced the unlimited access to her patient record, enabled by the fact that it was made digitally accessible to all health personnel, as a nightmare. Her privacy was violated, as sensitive personal health information was accessible by a simple login.

Patient autonomy can be defined as asserting "the primacy of individuals to control and govern their own actions, person, and property. Implicit in this concept is the assumption that the greater the degree of autonomy – and by extension, privacy and control over one's personal information – the more benefit will accrue to the patient" (Weitz et al. 2003: 294). In the case of M. we can understand her reaction to complain to the Norwegian Board of Health Supervision not only as to protect her privacy, but also to assert her autonomy as a patient. The Norwegian Board of Health Supervision did not criticise the physiotherapist for violating privacy laws (this would have led to reprimand or worse). What was at stake in the case was the autonomy of M. as a patient in the Norwegian health care system. What makes M. story special, however, is that she had decided to share her story with the largest national newspaper in Norway. She decided to speak out publicly about her medical history, the history she wanted to protect from unwanted scrutiny by medical personnel, in order to 'restore' her autonomy as a patient and as a human being. This case shows that it is not so much about finding balance or equilibrium between autonomy and dependency. M. shows us that it may be more appropriate to understand the relationship between autonomy and dependency as a balancing *act*, and ongoing negotiation and positioning. There was no need for M. to speak out publicly in order to make her case for the Norwegian Board of Health Supervision. In order to restore her autonomy as a patient, M. chose to publicly question the human scale underlying the digital technologies used for her electronic patient record and demanded an improved scale, built on her understanding of human autonomy. M. suggests with her story that autonomy is not something she has, but something she has to negotiate and work for, including giving up part of her privacy. Human autonomy, we see in this vignette, is the effect of the relations between people and things, including privacy laws, health care personnel, an electronic patient record, social norms (i.e. what is acceptable behaviour for a physiotherapist), digital technologies, and a national newspaper.

Vignette III gives us a related perspective on the 'equilibrium' between dependency and autonomy. The personal alarm, a digital technology, is presented as a tool, which enables people to continue their autonomous lives at home. Dependency on a simple technology,

which only involves pressing a big button, can bring, in the case of the personal alarm, an enormous benefit in terms of human autonomy. However, the authors of the article from which this vignette is taken, tell us that Mrs. Paquita's experience is common: even though she did not feel well, she did not press the button on her personal alarm. The authors propose to understand Mrs. Paquita's action, or non-action, as an expression of the conflict between different ways of practicing autonomy (Lopéz & Domèneche 2009). One way of practicing autonomy is to challenge the body. Mrs. Paquita and other "users that do not press the button despite feeling ill, far from asking themselves what is happening, instead resist questioning their bodies and emphasizing their fragility, thus safeguarding their world and keeping their lifestyle stable" (ibid:191). The other way of practicing autonomy is to manage a body-at-risk (ibid). To continue their lifestyle, users need to accept wearing the personal alarm and answering regular questions about their health situation. In that sense the technology does not work with clear distinction between illness and health, but works with levels of risk in the body. Thus the body needs constant monitoring and self-surveillance. Mrs. Paquita's story is thus about two different conceptualisations of the body. On the one hand she trust her own (knowledge of her) body when she mentions 'it will go away and as in fact it did go away'. On the other hand she sometimes wears the alarm, even if she hesitates to use it, because it helps her to manage the risk of being too nervous to remember her daughter's telephone number when she doesn't feel well. The authors conclude that these two ways of experiencing the body and their related embodied autonomies, emerge from the interplay between technologies (personal alarm), practices (monitoring, self-surveillance), bodies (elderly, caregivers, relatives), and spaces (the user's homes) (ibid: 192). Mrs. Paquita's story suggests that we can't speak of finding an 'equilibrium' between human autonomy and dependency on technology. If that was the case, we would be able to find one definition of autonomy that would explain Mrs. Paquita's case. In stead we see two different conceptualisations of the bodies, involving two conflicting autonomies, which emerge through the use of the personal alarm, each enacting different configurations of technologies, practices, bodies and spaces. The vignette presents us with a more complex understanding of the autonomy/dependency scale. Instead of an equilibrium or balance, it suggests that we speak of autonomy/dependency 'arrangements'.

4   Two challenges

In the Introduction we identified two challenges we need to address in the exploration of the relationship between automation and human autonomy. We need to rethink human autonomy and we need to go beyond the technological instrumentalism that underlies governmental and IT policies for public sector services in Norway. In the following sections we will briefly address these challenges and formulate our understanding of the relationship between autonomy and automation, which will guide our research.

4.1   Autonomy-in-relation

Feminist critiques on the conceptualisation of human autonomy focussed both on the idea of autonomy as well as the underlying assumptions, such as the idea that a human being can be, and act, self-sufficient and independent. These critiques help us to take our understanding of human autonomy beyond an Enlightenment idea of autonomy towards a relational perspective on autonomy. Especially Lorraine Code's 'symbolic critique' of autonomy is important for our investigation of autonomy and automation in an 'Information Society for All'. The notion of an inclusive Information Society is based on the idea of the individual 'consumer' of public

services, on individual interests and rights. Code's critiques focuses on the idea of the autonomous self, of autonomy as a characteristic of modern man.

In a discussion of the three vignettes we described a notion of autonomy which is not a property of human beings. The vignettes showed that autonomy is multiple and complex, and the effect of particular arrangements of people and things. Autonomy, as we saw in particularly in vignette II, is also something we practice. In *When species meet*, Donna Haraway (2008) discusses such relationality between 'species' like artefact, machine, landscape, organisme, or human being: "Autonomy as the fruit of and inside relation. Autonomy as trans-acting" (p. 164). Haraway uses the term *autonomy-in-relation* (ibid), which we read as opposite to the idea of *autonomy-of-the-self*, the Enlightenment idea of autnomy, which Haraway (1991) discusses and rejects in her Cyborg Manifesto. The notion of autonomy-in-relation addresses Code's proposal for ecological thinking and opens up space in which we can integrate the concerns of relational perspectives towards autonomy: the social aspects of autonomy (Mackenzie and Stoljar 2000) and the material aspects of autonomy such as the digital technologies that are introduced as part of public service delivery in Norway. The notion of autonomy-in-relation, we propose, may supports exploring autonomy as an effect of sociomaterial relations.

4.2 Beyond technological instrumentalism

Andrew Feenberg describes the instrumental theory of technology as "the common sense idea that technologies are 'tools' standing ready to serve the purposes of their users. Technology is deemed 'neutral', without valuative content of its own" (1999: 5). The neutrality of technology, Feenberg argues, implies at least the following points (ibid: 5-6):

1. Technology is indifferent to the variety of ends it can be employed to achieve.
2. Technology seems indifferent to politics (a hammer is a hammer, both under socialism and under capitalism), thus the transfer of technology is only inhibited by financial costs.
3. Technology is rational; it embodies an universal truth. Hence what works in one society can be expected to work in another society too.
4. Technology stands under the same norm of efficiency in any and every context.

This instrumentalist perspective of technology guides, we argue, most government policies that inform the introduction, development, and application of information and communication technologies in the public sector. For example, the automation of the Norwegian income tax return process (see Vignette I) shows how the liberal faith in progress results in an instrumentalist perspective on human-controlled technological development. Most tax payers receive their tax return pre-printed with information from relevant sources, such as banks, employers, social security, property registry etc. and are offered an automatic calculation of their taxes. No action is required by the taxpayer, no need even to affirm the information. For many, the automated tax process provides autonomy, as the need to understand the process and to grapple with the many sources of information and the calculations of percentages for county and state taxes, is gone. However, taxpayers may "unlearn" what taxes are for and how to calculate them – and even lose track of their own personal economy. The more subtle individual autonomy, based on an understanding of the tax system, may be lost, unless procedures are added to the infrastructure to support and maintain the necessary level of knowledge.

Transparency in public government is a principle as well as an important outcome of a democracy. A transparent and visible government enables individual citizens to become

active participants in the democratic deliberations. Without knowledge of the government and the public administration, the citizens cannot control nor challenge the government. Without such knowledge they have no basis for opinions or for participating in democratic decision-making. The use of digital information and communication technologies in public administration does not necessarily introduce a conflict between having an efficient administration and the strengthening of democratic processes. We should not disguise or hide complicated public processes, but rather use our technological possibilities to make them more accessible by presenting them in such ways that are easier to understand.

We thus argue that we need to go beyond the instrumentalist perspective in order to analyse the potentials and constraints of the use of ICT in the Norwegian public sector. Regarding the question about the relationships between digital technology, user dependency on technology, and human autonomy, we suggest we need to address such complex issue in a non-deterministic and non-binary frame. Dependency on digital automation and human autonomy are not the extreme ends of a continuum in which more digital automation means less human autonomy. The vignettes show us a more complex relationship between autonomy and automation; they are mutually constituted – they exist because of each other. The mutual construction of people and artefacts is one of the main premises in Science and Technology Studies (STS) (Barad 2007; Latour 2005; Suchman 2007). Case studies in STS and Information Systems show that people and technologies are not autonomous entities that interact, but mutual dependent entities that form an intimate relationship (e.g. Aanestad 2003; Law and Mol 2002). The interaction between a digital system and its individual users can only be understood in the wider arrangements of people and things, which can include a variety of actors such as technology designers, law, norms, and economic motives (Lessig 1999; Nygaard 1996). Such sociomaterial relations are always multiple and complex and therefore defy causal and linear approaches. Such an analysis opposes technological instrumentalism and the idea that ICTs are ethically neutral and get their moral meaning only through use (Bratteteig 2004; Finken 2005; Mörtberg 1997; van der Velden 2008; 2009)[7].

4.3 Sociomaterial relations

In our approach we affirm both human agency and technological agency, but conceptualise these agencies not as symmetrical, neither as autonomous (i.e. as characteristics of people and technologies) but as outcomes of sociomaterial relations (Elovaara and Mörtberg 2007; Mörtberg and Elovaara 2010; Haraway 2003; Suchman 2007). Consequently, progress, in the form of an inclusive 'Information Society', is not a causal effect of autonomous agencies, but the outcome of ongoing, critical, responsible and generative configuration work. The key challenge thus becomes: "how to configure [sociotechnical] assemblages in such a way that we can intra-act responsibly and generatively with and through them?" (Suchman 2007: 285).

An example of such configuration work are presented by Bødker et al (forthcoming 2009), who describe a Danish participatory design process in a public service delivery context with new parents figuring out their parental leave arrangements together with social security case handlers. The process aims to arrive at a shared, collaborative computer-based system where case handlers and parents can share information as well as maintain the boundaries and differences in perspective and interests that their two roles imply. Another example is provided by Ekelin (2007), who reports on the introduction of social software to enable the citizens to communicate with the local politicians in a Swedish city. Some politicians were not prepared to use the system because of fear of being held accountable for archivable statements to citizens: the work to check that the answer was correct was too much for a volunteer politician to engage in.

One important consequence of the conceptualisation of human-technology relationship as sociomaterial assemblages and relations is the refiguring of the concept of human autonomy, from a characteristic of people to an effect or outcome of the assemblage, to *autonomy-in-relation*. Human autonomy is usually defined as the capacity of a rational individual to make informed decision, see for example the description of patient autonomy (see Section 3.2), which asserts that the greater the degree of autonomy, the more benefit for the patient (Weitz et al. 2003). This understanding of autonomy as the characteristic of rational human beings - Kant's conception of autonomy - does not enable the deeper understanding of the relationship between autonomy and automation we seek. We therefore argue that we need to investigate how autonomy is practiced: how it is enacted (Law 2004) in the network of people and things. This understanding will allow us to see how autonomy is the effect of particular, ongoing, and more or less durable sociomaterial practices (Suchman 2007), which can be contested and redesigned. Secondly, it will allow an understanding of autonomy as multiple and situated, that is, autonomy can be different things in different situations and can mean different things for different people.

5   Concluding remarks

Our paper is informed by questions about the complex relationship between digital automation and human autonomy and the different challenges this relationship poses to society, in particular to the continuous work towards an inclusive 'Information Society'. By exploring these questions with the help of three vignettes, we were able to deepen our understanding of autonomy. Our conceptualisation of human autonomy as an effect of sociomaterial practices will enable us to contribute to new understandings of how digital automation processes in the public services sector interact with the autonomy needs of the users of these services and the effects of these interactions on the inclusive information society. Secondly, it will help us to contribute to (re-)figurations of digital designs for public sector services that support flexible configurations of digital automation and human autonomy. It will also extend our understanding of the role of age, gender, diversity, and digital skills levels in the different configurations of digital automation and human autonomy, as well as the understanding of how different design approaches may effect different conceptualisations of the citizen in an inclusive information society.

Our future research will include three concrete cases in Norway. The first case, *Learning (more) about taxes*, focuses on the fully automated income tax return, as described in Vignette I. For many, the automated tax process provides autonomy, as the need to understand the process and to grapple with the many sources of information and the calculations of percentages for county and state taxes, is gone. However, taxpayers may "unlearn" what taxes are for and how to calculate them – and even lose track of their own personal economy. The more subtle individual autonomy, based on an understanding of the tax system, may be lost, unless procedures are added to the infrastructure to support and maintain the necessary level of knowledge.

The second case study, *Patients, privacy, and the Internet*, focuses on the increased digitalisation of personal health data, which has resulted in automated procedures in which personal health data is 'de-identified' or data, which can identify an individual, is encrypted, removed, or pseudonymised. While patient privacy is more and more automated in health information systems, patients themselves are expected to take a more pro-active role in their well-being and recovery. According to Weitz et al. (2003), control over one's privacy will increase patient autonomy, which will accrue more benefit to the patient. We can see this, for example, among some Norwegian patients who voluntarily and publicly share their personal

health information in social networking sites on the Internet. This case study aims to explore patient privacy from a patient perspective, focuses on how patients perceive, negotiate, and take control of their privacy within the wider *regulatory ecology* of patient privacy in Norway.

The third case study, *Distributed health care*, focuses on health care delivery in the home. As populations grow older, societies need to address the lack of health care workers in the health care and elderly care section. One solution is to engage patients, elderly and their families, implying that more health care is moved out of the hospitals and care institutions into the homes. An aspect of this solution is the redistribution of work, from institutional care to home care, which is by necessity accompanied with a re-distribution of medical and legal responsibilities and of economic and organisational structures. ICT is more and more used to support this re-distribution. However, only particular aspects of health care work will be or can be delegated to ICTs. Automation may lead to autonomy (e.g. people may be able to stay at home longer) but also to lock-ins and dependencies (e.g. KOLS patients who have become dependent on heavy equipment). The delegation of responsibility to digital technologies, as a part of a health care services provision, invites a discussion about the kind(s) of autonomies offered in the relationships between humans and technologies and how the notion of human autonomy may be illusory if the user does not understand the system or the responsibility delegated to the system.

Notes

[1] 300 million kroner is about 34 million Euro or 45 million US dollar.

[2] "Autonomy and automation in an Information Society for All" is a four-year research project (2009-2013) funded by the Verdikt programme of the Norwegian Research Council.

[3] Human scale, taking the proportions, capabilities, and dimensions of the human body as measure for, for example, the dimensions of a building, plays an important role in architecture.

[4] Based on Aftenposten, 29 May, 2007 (original text in Norwegian).

[5] Aftenposten, 26 April 2009 (original text in Norwegian)

[6] Excerpt from an interview with Mrs Paquita, user of the telcare service, and Joan, a volunteer. Mrs. Paquita, aged 82, lives alone in a working-class neigbourhood of Barcelona. She has the help of a Filipino caregiver who stays with her three hours a day.

[7] A perspective also found in social determinist and in some social constructivist approaches, see e.g. Rundle & Conley 2007.

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