

Service Innovation and Welfare Technology for Sustainable Home Medication: Insights from Social Practice Theory

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Abstract

Resource limitations and demographic changes constitute challenges to European healthcare services. Service innovation and welfare technologies are expected to help make services more efficient and increase the autonomy and quality of life of citizens. The field of design is expected to help understand how that may happen. Innovation activity in Norwegian municipalities is however limited. A better understanding of how to support public service innovation is needed. To understand what is to be changed and by taking home medication as its case, this paper explores how to theoretically frame the challenge. It does that by first providing an overview of perspectives on the state of service innovation and welfare technology implementation in municipalities. Next, it introduces social practice theory as a way of capturing what goes on. Finally, it discusses the implications of seeing service innovation and production as (complexes of) social practices. It argues that such a perspective nuances the expectations for innovation to be exported into new domains, and for welfare technologies to make services more efficient. Change is seen as co-evolutionary, innovation as collectively accomplished, and what tools and approaches open up for as related to the changing configurations of the practice complexes they are part of.

Keywords

Service design; welfare technology; sustainability; social practice theory

In line with other countries, Norway is facing an increase in the number and share of elderly persons. By 2025, almost 16 % of the population will be 67 years old or more (Meld. St. 13 2011-2012). Coupled with the growth in new user groups with chronic illnesses, lifestyle diseases or both, this means that unless people stay healthy longer or changes to services are made, one out of three young people will have to choose a health and social care-related education by 2035 (Meld. St. 13 2011-2012). This is not feasible, and changes to public services are therefore considered indispensable.

This reflects developments at a European level. As part of the Europe 2020 strategy, a European Innovation Partnership on active and healthy ageing has been launched. The aim for 2020 is threefold, to 'enable our citizens to live longer independently in good health by increasing the average number of healthy life years by 2, and, in achieving this target, to improve the sustainability and efficiency of our social and healthcare systems, and to create an EU and global market for innovative products and services with new opportunities for EU business' (European Commission 2012, p. 40). The goal is thus to combine a shift towards more years of autonomous, independent living, with service efficiency improvements and business opportunities.

Welfare technology is expected to hold a central place in the healthcare services of the future, and to contribute to making them more efficient (The Norwegian Directorate of Health 2012; Meld. St. 29 2012-2013). Welfare technology is defined as technical

assistance that contributes to increased safety, security, social participation, mobility and physical and cultural activity, and that increases the ability of individuals to lead an independent and autonomous life, in spite of illnesses or social, mental or physical disabilities (NOU 2011:11, p. 99; Meld. St. 29 2012-2013, p. 110). In addition, it may work as a support for relatives, or improve the access to or the resource efficiency and quality of a service offer, and prevent the need for services, admissions and days spent in care institutions.

A recent White Paper on the future of care focuses on three goals related to the role of innovation in reducing the mismatch between resources and the needs for care (Meld. St. 29 2012-2013, p. 11). The first is to obtain knowledge about, find, mobilise and make use of the total 'care resources' in society in new ways. The second is to develop new forms of care by means of new technology, new knowledge, new methods, and by changing organisational and physical boundary conditions. The third is to support and strengthen the research, innovation and development competence of municipalities. An Official Norwegian Report calls for practical contributions and insights from architecture, design and technology with regards to how dwellings and technology may increase the quality of life of users and the efficiency of service provider (NOU 2011:11, p. 129).

This paper reports on a recently initiated interdisciplinary project. The project aims at contributing with knowledge about the challenges and opportunities associated with service innovation and technological support of care, at different levels and for different stakeholders, given goals about safe and sustainable delivery of care. The project combines perspectives from design, engineering, nursing, sociology and philosophy, and takes home medication as its case. This is relevant, as home nursing is resource intensive, and medication errors may lead to complications, hospitalisation and death. Home medication serves as an example of an area in which technologies and service innovation are expected to contribute to resource savings, in addition to improved adherence.

This paper takes processes of service innovation and technology procurement in Norwegian municipalities as its starting point. The background for doing so is the reported gap between political ambitions and tool development, and the limited actual innovation activity in municipalities (e.g. Grut et al., 2013). It seeks to theoretically capture the characteristics of service innovation, in-home technology use, and the relations between them, to get a better understanding of what kind of challenge it is to foster change in the direction of safe and sustainable home medication. To do that, the paper draws on insights from sociology, design, organisation studies and sustainable consumption literature, explores the value of seeing both service innovation and production as social practices (e.g. Reckwitz 2002), and discusses what insights and implications such a view may lead to.

The paper first provides an overview of perspectives on the state of innovation in the health and care services of Norwegian municipalities. Next, it presents and explores social practice theory as a potentially relevant theoretical framework for understanding the current situation and the preconditions for change in service innovation and production, and finally, it discusses what the implications of such a perspective may be.

Service innovation and welfare technology implementation in Norwegian municipalities

The current state: Challenges and opportunities

This section provides an overview of what are currently considered key challenges and opportunities associated with service innovation and welfare technology in Norwegian municipalities.

In Norway, the national goal is that welfare technology should be an integrated part of the service offer by 2020 (Meld. St. 29 2012-2013). The general picture painted by policy documents and reports on the state of the implementation and use of welfare technology, is however that experiences are few and the development slow. Mapping the experiences with the integration of welfare technology in six Norwegian municipalities, Grut et al. (2013) argue that many are planning to initiate innovation projects, but few projects are actually running. This does in turn mean that with regards to the potential for technologies to actually contribute to savings, experiences are few. Grut et al. (2013, p. 33) were in their study for example not able to assess the effects of the implemented measures or study the experiences with the transition from pilot project to ordinary operation. No municipality had yet implemented welfare technology targeting elders as part of their ordinary service provision.

In a report on the implementation of welfare technology in public health and care services in the period 2013-2030, the Norwegian Directorate of Health (2012) summarises some of the challenges. The report points to strengthening of the service innovation competence in Norwegian municipalities as a precondition for the implementation of welfare technology. This is confirmed by Grut et al. (2013), who identify missing purchasing competence as one element inhibiting service innovation and the successful integration of welfare technology. They find that employees in the healthcare services experience that their technical knowledge is insufficient for making good purchase decisions. Technology suppliers do in much the same vein lack in-depth knowledge on services and user needs, as well as legal and ethical boundary conditions.

The Norwegian Directorate of Health (2012) also points to the need for a driving force or catalyst, to arrange for welfare technology solutions and foster public service innovation. It further sees a need for disseminating knowledge about the challenges and limitations associated with the integration of welfare technology in public health and care services, and the potential opportunities opening up, also to users and their relatives. The market is described as immature, actors that could have safeguarded the existence of public and private demand for welfare technology as missing, and standards as largely absent. The report argues that the immature character of the market is reinforced due to the lack of procurement competence in municipalities, which fail to act as demanding customers.

The message is thus that while technical challenges may also be present, making services more efficient is to limited extents considered a technical challenge. It is for example rather a question about strengthening the service innovation and procurement competence of municipalities. In addition, it is an open question how, to what extents and in what areas technology may contribute to reducing the resource intensity of services.

Tools and initiatives

To cope with the lack of innovation activity and change the situation, different initiatives have been launched. The goal here is not to provide an exhaustive overview, but to highlight some relevant examples.

In Norway, a national initiative for 'needs-driven innovation' and industrial and commercial development in the healthcare sector was established in 2007 by the Ministry of Health and Care Services, and the Ministry of Trade and Industry (The Norwegian Directorate of Health 2011). While at first focusing on the specialist services, it has been evaluated, and an extension from a five to a ten-year period and a broadening of scope to also covering the care sector and thus also municipal services, recommended (Meld. St. 7 2008-2009). 'Needs-driven innovation' is in that context defined based on a Danish definition of user-driven innovation (Danmarks Erhvervsråd 2006). It is seen as about mapping and understanding the experienced and latent needs of the users, while identifying the market potential and technology, and finding partners capable of meeting the actual need and

seeing how technology can be used in new ways (The Norwegian Directorate of Health 2011, p. 5).

The national initiative has come accompanied by dissemination events and courses, and the development of tools and approaches (e.g. Reitan et al. 2011; Grut et al. 2013; The organisation of the municipal sector 2013). The tools include a digital tool for making use of innovation methodology in a specific project or learning about innovation, 'New, Useful and Utilised' ('Nytt, nyttig og nyttiggjort' or 'N³') (The organisation of the municipal sector 2013). This tool presents an abstracted innovation process consisting of work on needs, the development of a solution, and testing. Drawing on Carlson and Wilmot (2006), it suggests that the five aspects (1) important needs, (2) value creation, (3) innovation champions, (4) innovation teams, and (5) organisational alignment are critical to the opportunities for succeeding with an innovation. Further, based on the ISO standard for human-centred design (ISO 9241-210 2010), and the mentioned mapping of experiences with welfare technology in Norwegian municipalities (Grut et al. 2013), a roadmap specifically addressing welfare technology-related innovation has been developed. This tool is intended to guide the process from planning to the establishment of a new practice.

This all comes in addition to general initiatives focusing on innovation through public procurement (e.g. Meld. St. 7 2008-2009). Edler and Georghiou (2007) describe public procurement as an innovation policy tool that may drive innovation when oriented towards innovative products and solutions, but also as an underused one beginning to receive more attention at a European level. The emphasis on procurement is again linked to the descriptions of the market for welfare technology as immature, the lack of public and private demand for it, and the insufficient procurement competence of municipalities (The Norwegian Directorate of Health 2012). The Agency for Public Management and eGovernment (2012, p. 3) links the development processes described above to processes of procurement. They recommend starting out by identifying what the central challenge is and the needs are, before engaging in a broad dialogue with the market. If relevant solutions do not exist, a research and development project may be considered. If they do, innovative public procurement is a more relevant approach.

Except for the study by Grut et al. (2013), little research has been done on actual work on service innovation and welfare technology in Norwegian municipalities. The mentioned innovation-oriented initiatives are relatively new, and it is too soon to say much about their ability to spur change.

The distance from the abstract notions in guides and tools to the details of everyday work and private life, may also be great. In the context of interaction design, Stolterman (2008) argues that insufficient understandings of the nature of design often has inhibited the success of design research aiming at supporting design practice. As design now is moving into new domains, to for example target issues that traditionally have been dealt with by fields like management and organisation, it is not only relevant to gain insight into the theories and understandings upon which they are based, but it also becomes highly relevant to examine what characterises design (Sangiorgi 2011; DiSalvo et al. 2013).

The topic in question here, how to support service innovation for safe and sustainable home medication, taps into challenges at different levels and in different contexts. Organisations are expected to transform themselves to become critical procurers, co-creators or service innovators, and thus to engage in or with design activity. To support that, a sufficient understanding of what kind of challenge that is, what it entails and what the degrees of freedom are, is needed. Theoretically coping with such issues requires theories that are capable of capturing the characteristics of and relations between innovation and professional healthcare activities, and medication practices in private households.

A practice-oriented perspective on service innovation and production

In the following, I will explore the value of seeing design and innovation, service production, and the everyday activities of citizens as social practices. I will introduce some central features of practice theory, by drawing on literature on sociology, design, organisation studies, and sustainable consumption, and by introducing a modified version of Kimbell's (2012) concepts 'design-as-practice' and 'designs-in-practice' – service innovation and service production as practice, and discuss what the implications of such a view may be.

Social practice theory

When taking the social practice as unit of analysis, attention is directed towards ordinary activities or processes such as cooking or cleaning, in this case, innovation, procurement, and medication. Following the much-cited definition of Reckwitz (2002, p. 249) a practice may be described as 'a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge'. Simplifying that, Pantzar and Shove (2010, p. 450) distinguish between 'material' elements which include things, 'skill', or bodily knowledge and competence, and 'image', or mental activities and symbolic meaning.

A practice can however not be reduced to any such element (Reckwitz 2002). Rather, it is a coordinated entity and its existence depends on repeated performances where the single tasks are held together by phenomena summarised by Warde (2005), drawing on Shatzki (1996), as understandings, procedures and engagements.

Practices are further social in that they are guided by 'shared practical understandings' (Shatzki 2001, p. 2), indicating 'what courses of action are not inappropriate' (Warde 2005, p. 140). They are however also internally differentiated, with practitioners adapting, experimenting and improvising according to the specific situation they find themselves in, and the differences in their understandings, procedures and engagements (Warde 2005).

Theories of social practice de-centre humans from analyses, seeing them as agents or 'body/minds' that 'carry' and 'carry out' practice, the individual being 'the unique crossing point of practices', or the bodily-mental routines that he or she is carrier of (Reckwitz 2002, p. 256). Neither humans nor technologies are privileged, and the interest lies in the relational and emerging (Orlikowski 2007). The social and material may be seen as 'constitutively entangled' in practice (Orlikowski 2007, p. 1437).

Together the individual practice performances make up a path or trajectory of development (Schatzki 1996). The history of a practice, as well as the wants that emerge from the specific practice performances, matter to what happens next (Schatzki 1996; Warde 2005; Shove et al. 2007). Different practices and elements form systems or 'bundles' of practices with different qualities, interacting with each other (Schatzki 2006; Pantzar and Shove 2010).

When it comes to the prospects for change, it is a central point that practices are both routinized and dynamic. From a practice theory perspective, it is the routines, in the form of 'routines of moving the body, of understanding and wanting, of using things, interconnected in a practice' that constitute social structure (Reckwitz 2002, p. 255). These occur in time, as repetitions. Their routinized character makes up inertia inhibiting change, but their dynamic character is at the same time what opens up for and spurs it. Breakdowns and changes in structures happen as 'everyday crises of routines' (Reckwitz 2002, p. 255).

In the career of a practice (and a practice carrier), different stages or states may be identified, as in their emergence, persistence, and dying out (Warde 2005; Pantzar and Shove 2010). Such processes may result from changes in the composition of the practice, for example as links between elements are made, sustained and broken (Pantzar and Shove 2010).

While it is possible for actors such as firms and policy-makers to try and disrupt what exists, support a development in a new direction, or establish an entirely new practice, for example by introducing and promoting practice elements and the links between them – a 'proto-practice' (Pantzar and Shove 2010, p. 450), it is the integration in practice that matters.

Service innovation as practice

When it comes to public sector service innovation and what helps and hinders it, Kimbell (2012, p. 131) argues that a practice-oriented perspective on design and designing may aid the understanding of the work of designers by 'moving away from a disembodied, ahistorical design thinking to a situated, contingent set of practices carried by professional designers and those who engage with designs, which recognizes the materiality of designed things and how they come to matter.' She highlights how a practice-oriented view is apt for avoiding some of the problems associated with dominant perspectives on design, such as the dualism between thinking and knowing and acting, the neglect of the diverse ways in which designers work, and finally, the tendency to see the designer as the main agent in design activity.

Taking the practices involved in service design or innovation as unit of analysis directs the attention to their characteristics. This is a question about the highly diverse elements that constitute them, how they are embodied, guided by socially shared conventions or rules and internally differentiated, routinized and dynamic, and situated in space and time. Such a view highlights that the 'culturally specific expertise' and what are established as routinized ways of working in specific places opens up for certain possibilities while excluding others (Kimbell 2012, p. 142). It also points to what creates resistance against different ways of working. At the same time, it de-centres designers and opens up design to other participants, including material objects such as computers, sketches and prototypes, and to other stakeholders such as managers, clients and end-users (Kimbell 2012).

In much the same vein, it is possible to describe organisational activity as bundles of practices and material arrangements that overlap and connect, also with the 'practice-arrangement bundles' of other organisations (Schatzki 2005). The material arrangements refer to 'assemblages of material objects – persons, artifacts, organisms, and things' (Schatzki 2006, p. 1864).

In this case, the challenge is partly to open up for or introduce a set of design and innovation practices to organisational settings in which they have not existed before, or where they only have existed to limited extents. A practice-oriented view highlights the complexity of that (Kimbell 2012). To exemplify, practices relevant to service innovation and technology implementation may for example include purchasing practices, management practices, administrative practices, and care practices, as well as the (bundles of) practices of other organisations and actors, such as governmental organisations, industry organisations, private businesses, NGOs, and private citizens. Each has its own characteristics and history or trajectory of development, and the different practices relate in different ways. In addition to innovation tools, material ingredients may include search engines, requirement specifications, and online databases for public procurement. Practical skills and know-how regarding legal and ethical aspects, and how to go about innovating, including who to involve at what point, may exist or be missing. Finally, there are ingredients concerning image or symbolic meaning, as in what

constructs such as 'care' and service quality entail in different practices. Practices of service innovation and innovative procurement may not exist, be about to emerge or already have some history.

The conventions practitioners work by, that are reproduced and changed in practice, constrain and enable the opportunities for creating change. Different practices may both interact and create stability or conflict with each other. The challenge becomes to destabilise or disrupt something that exists, mediate conflicts, or introduce something new, which in turn has to compete with or be integrated into pre-existing practices, guided by other ideas about 'what is not inappropriate' (Warde 2005, p. 140; Julier 2007).

Service production as practice

Moving on to the point at which the output of design, in this case a service around home medication, is tested or put into practice, practice theory highlights the innovating role of citizens (Pantzar and Shove 2010). Innovation continues in practice, where they make the integration of practice elements happen and therefore may be seen as co-innovators and co-producers of service. Practice components such as technology are then only indirectly important (Shove et al. 2007). The performance of medication management practices also emerges from relations to and between other issues, such as the spatial features of homes and the daily rhythm of other activity flows, as found by Palen and Aaløkke (2006). Products such as medicine dispensers enter into an everyday life consisting of multiple activities, each guided by different conventions regarding why and how to do what. Given the goals to enhance the autonomy and well-being of individuals while increasing the resource efficiency of services by means of welfare technology, this is highly important. From a practice theory perspective, the effect of an intervention emerges at the level of practice, with objects and practices co-evolving, and each practice performance resulting in a new starting point for the next (Shove 2003; Shove et al. 2007).

Related to that, practice-oriented research on sustainable consumption criticises technology-oriented strategies for ignoring what service standards are and what is taken to be normal, and how that develops and varies across space and time (Shove 2003; 2010). By concentrating on making technologies such as washing machines and televisions more efficient and getting them into the homes of consumers, service expectations highly relevant to resulting resource use levels, for example for temperature levels, display sizes and product lifetimes, are taken for granted, and how they develop over time not questioned. When ignoring the social and situated character of consumption, the characteristics and development of the practice and its position in everyday life, the risk is for example that rebound effects may occur. In the context of sustainable consumption, the rebound effect is defined as 'a behavioral or other systemic response to a measure taken to reduce environmental impacts that offsets the effect of the measure' (Hertwich 2005, p. 86).

Against that background, and based on research introducing practice theory to design (e.g. Shove et al. 2007), a branch of design for sustainability research argues that taking the social practice as unit of analysis and intervention may help capture the systemic dynamics of everyday consumption, and potentially open up for more radical innovation and more substantial resource savings (Scott et al. 2012; Kuijer et al. 2013; Pettersen et al. 2013). This is relevant also in the context of public healthcare services. It highlights the importance of seeing the potential for technologies to contribute to savings as depending on the local and continuously developing (bundles of) professional and residential practices of which they are part, and to develop approaches acknowledging this.

Discussion: Implications for (the governance of) service innovation and production

Having introduced practice theory, also in the context of design activity and the use of designs, this section moves on to discussing some implications. It still focuses on the prospects for service innovation and welfare technology implementation in Norwegian municipalities, with the aim of supporting safe and sustainable home medication.

The article argues that understanding the nature and detailed characteristics of practice is a prerequisite for being able to transform it, and to foster change in desired directions. To build such an understanding, practice theory provides structured guidance (Julier 2007). Studies of the composition and performance of (bundles of) practices, their relation to other (bundles of) practices, and their development over time may help identify what enables and constrains change (e.g. Pettersen 2013). Taking the social practice as unit of analysis means that ordinary everyday activity is placed at centre stage. Here, this is a question about exploring how service innovation and service production actually is done, with what, by whom, when, where and why, how it relates to other activities, and how it has developed over time. It is a question about what shared conventions guide and are reproduced in such activity, and how they change.

In addition to resulting in insights on what creates resistance and change, such studies may help identify possible intervention points and directions to pursue, and inspire the generation of ideas and concepts for gearing change in new directions (e.g. Pettersen 2013). Depending on the characteristics and development of the practice bundles, different handles for supporting change may exist. Such opportunities may include influencing the elements that the practices consist of, the relation between different practices, the trajectories of practices and practitioners, and finally, the 'circuits of reproduction' (Shove et al. 2012, p. 146). As argued in research on consumption, taking the practice as unit of intervention might open up opportunities for more radical change than what taking single products, users and the relations between them does. This is highly relevant when faced with the need to cope with considerable demographic changes. In addition to guiding descriptive (design) research, practice theory might form a starting point for the assembly and development of tools and approaches for design and governance (Shove et al. 2012; Kuijer et al. 2013).

With regards to the opportunities for creating change however, establishing innovation and medication practices is not necessarily simply a question about developing and promoting practice elements and recruiting the practitioners for it. While de-centring designers and 'users', practice theory points to the role of other stakeholders, practical knowledge and objects in design activity and activities involving designs (Kimbell 2012). Many different actors are involved in innovating and co-creating service through their practices, with their own service standards to adhere to. Designers as well as municipalities are further part of the systems they try to change (Shove et al. 2012; DiSalvo et al. 2013). Practices are seen as outcomes of processes over which no single actor is in charge, and as always undergoing change (e.g. Shove et al. 2012). It is an important point that the effects that interventions have are considered unpredictable. Rather than trying to govern or design for some desired end state, this implies that the challenge is to try to support processes of change in desirable directions.

Practice theory does, as pointed out by Kimbell (2012, p. 143), shed a sobering light on the prospects for 'exporting' design into new domains separated from design culture, in this case the prospects for introducing service innovation expertise into Norwegian municipalities. It nuances the dominant policy request for 'service innovation competence' in Norwegian municipalities by highlighting the complexity of it. It suggests that to understand the perceived lack of demand for welfare technology, and the opportunities for managing it, a better understanding of the (potential) relation between such technologies and the bundles of related professional and private practices may be needed. Such

studies may in turn aid assessments of how the initiatives and approaches for innovation and procurement promoted at a national level work in practice, and the findings inform attempts at developing new or improved versions.

With regards to the efficiency of services, it is a relevant point that technology use and resource consumption happens 'within and for the sake of practices', while wants and 'needs' emerge from them (Warde 2005, p. 145). When it comes to the faith in welfare technology as means for making services more efficient, practice theory points to how the role of objects is indirect (Shove et al. 2007). Medication practices are co-productions. Their resulting resource use levels and outcomes are thus on-going accomplishments to which many different actors, both human and non-human, contribute.

Conclusion

This paper has explored how to frame the potential role of public service innovation and welfare technology in making them more efficient. More specifically, it has explored the capability of practice theory to improve the understanding of what is to be changed. It suggests that to understand how to support and govern change in service innovation and production, as well as what constrains and enables it, it is necessary to look into the detailed characteristics of the (bundles of) practices that are to be established, changed or disrupted. What they are in the specific case of home medication, and what possible directions for design and governance may be, are questions for future research to address.

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