

Satu Pekkarinen

INNOVATIONS OF AGEING AND SOCIETAL TRANSITION
Dynamics of change of the socio-technical regime of ageing

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ABSTRACT

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The purpose of this dissertation is to examine the dynamics of the socio-technical system in the field of ageing. The study stems from the notion that the ageing of the population as a powerful megatrend has wide societal effects, and is not just a matter for the social and health sector. The central topic in the study is *change*: not only the age structures and structures of society are changing, but also at the same time there is constant development, for instance, in technologies, infrastructures and cultural perceptions. The changing concept of innovation has widened the understanding of innovations related to ageing from medical and assistive technological innovations to service and social innovations, as well as systemic innovations at different levels, which means the intertwined and co-evolutionary change in technologies, structures, services and thinking models. By the same token, the perceptions of older people and old age are becoming more multi-faceted: old age is no longer equated to illnesses and decline, but visions of active ageing and a third age have emerged, which are framed by choices, opportunities, resources and consumption in later life.

The research task in this study is to open up the processes and mechanisms of change in the field of ageing, which are studied as a complex, multi-level and interrelated socio-technical system. The question is about co-effective elements consisting of macro-level landscape changes, the existing socio-technical regime (the rule system, practices and structures) and bottom-up niche-innovations. Societal transitions do not account for the things inside the regime alone, or for the long-term changes in the landscape, nor for the radical innovations, but for the interplay between all these levels. The research problem is studied through five research articles, which offer micro-level case studies to macro-level phenomenon. Each of the articles focus on different aspects related to ageing and change, and utilise various datasets. The framework of this study leans on the studies of socio-technical systems and multi-level perspective on transitions mainly developed by Frank Geels. Essential factors in transition from one socio-technological regime to another are the co-evolutionary processes between landscape changes, regime level and experimental niches. Landscape level changes, like the ageing of the population, destabilise the regime in the forms of coming pressures. This destabilization offers windows for opportunity to niche-innovations outside or at fringe of the regime, which, through their breakthrough, accelerate the transition process. However, the change is not easy because of various kinds of lock-ins and inertia, which tend to maintain the stability of the regime.

In this dissertation, a constructionist approach of society is applied leaning mainly to the ideas of Anthony Giddens' theory of structuration, with the dual nature of structures. The change is taking place in the interplay between actors and structures: structures shape people's practices, but at the same time these practices constitute and reproduce social systems. Technology and other material aspects, as part of socio-technical systems, and the use of them, also take part in the structuration process.

The findings of the study point out that co-evolutionary and co-effective relationships between economic, cultural, technological and institutional fields, as well as relationships between landscape changes, changes in the local and regime-level practices and rule systems, are a very complex and multi-level dynamic socio-technical phenomenon. At the landscape level of ageing, which creates the pressures and triggers to the regime change, there are three remarkable megatrends: demographic change, changes in the global economy and the development of technologies. These exert pressures to the socio-technical regime, which as a rule system is experiencing changes in the form of new markets and consumer habits, new ways of perceiving ageing, new models of organising the health care and other services and as new ways of considering innovation and innovativeness. There are also inner dynamics in the relationships between these aspects within the regime. These are interrelated and co-constructed: the prevailing perceptions of ageing and innovation, for instance, reflect the ageing policies, innovation policies, societal structures, organising models, technology and scientific discussion, and *vice versa*. Technology is part of the inner dynamics of the socio-technological regime. Physical properties of the artefacts set limitations and opportunities with regard to their functions and uses. The use of and discussion about technology, contributes producing and reproducing the perceptions of old age.

For societal transition, micro-level changes are also needed, in form of niche-innovations, for instance new services, organisational models or new technologies. Regimes, as stability-striven systems, tend to generate incremental innovations, but radically new innovations are generated in experimental niches protected from 'normal' market selection. The windows of opportunity for radical novelties may be opened if the circumstances are favourable for instance by tensions in the socio-technical regime affected by landscape level changes. This dissertation indicates that a change is taking place, firstly, in the dynamic interaction between levels, as a result of purposive action and governance to some extent. Breaking the inertia and using the window of opportunity for change and innovation offered by dynamics between levels, presupposes the actors' special capabilities and actions such as dynamic capabilities and distance management.

Secondly, the change is taking place the socio-technological negotiations inside the regime: interaction between technological and social, which is embodied in the use of technology. The use of technology includes small-level contextual scripts that also participate in forming broader societal scripts (for instance defining old age at the society level), which in their turn affect the formation of policies for innovation and ageing.

Thirdly, the change is taking place by the means of active formation of the multi-actor innovation networks, where the role of distance management is crucial to facilitate the communication between actors coming from different backgrounds as well as to help the niches born outside the regime to utilise the window of opportunity offered by regime destabilisation.

This dissertation has both theoretical and practical contributions. This study participates in the discussion of action-oriented view on transition by opening up of the socio-technological, co-evolutionary processes of the multi-faceted phenomenon of ageing, which has lacked systematic analyses. The focus of this study, however, is not on the large-scale coordination and governance, but rather on opening up the incremental elements and structuration processes, which contribute to the transition little by little, and which can be affected to. This increases the practical importance of this dissertation, by highlighting the importance of very tiny, everyday elements in the change processes in the long run.

Keywords: Ageing, innovation, societal transitions, multi-level perspective

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TIIVISTELMÄ

Satu Pekkarinen

IKÄÄNTYMISEN INNOVAATIOT JA YHTEISKUNNALLINEN MUUTOS Ikääntymisen sosio-teknisen toimintajärjestelmän muutoksen dynamiikka

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Väitöskirjassa tarkastellaan ikääntymiseen liittyvän sosio-teknisen järjestelmän dynamiikkaa. Tutkimuksen lähtökohtana on väestön ikääntymisen megatrendi, ja sen aiheuttamat laajat yhteiskunnalliset muutokset, joilla on merkitystä muuallakin kuin sosiaali- ja terveyssektorilla. Tutkimuksen keskeinen tarkastelukohde on *muutos*: kyse ei ole ainoastaan ikärakenteiden tai yhteiskuntarakenteiden muutoksesta, vaan samanaikaisista ja toinen toisiinsa vaikuttavista esim. teknologian, infrastruktuurin kulutuskäyttäytymisen, kulttuuristen käsitysten muutoksista. Yhtenä muutokseen vaikuttavana tekijänä on esimerkiksi se, että ymmärrys ikääntymiseen liittyvistä innovaatioista on innovaatiokäsitysten muutosten kautta laajentunut. Lääketieteen ja apuvälineteknologisten innovaatioiden lisäksi ikääntymiseen liittyviksi innovaatioiksi ymmärretään myös palvelu- ja sosiaaliset innovaatiot, samoin kuin systeemiset innovaatiot, jotka tarkoittavat yhteenkietoutuneita ja toisiinsa vaikuttavia muutoksia teknologioissa, rakenteissa, palveluissa ja ajattelumalleissa. Ikääntymiseen vaikuttaviin muutoksiin liittyy myös se, että käsitykset ikääntyneistä ihmisistä ja vanhuudesta ovat tulleet moniulotteisemmiksi: vanhuus ei enää ilmene ainoastaan negatiivissävyisenä sairauksina, rappeutumisenä ja asioista luopumisena, vaan on syntynyt uusia visioita aktiivisesta ikääntymisestä ja kolmannesta iästä, joille on leimallista vanhuuden voimavarojen, kulutuksen ja valinnan mahdollisuuksien korostuminen.

Väitöskirjan tutkimustehtävänä on avata ikääntymiseen liittyviä sosio-teknologisia muutosprosesseja ja mekanismeja. Tutkimuksen viitekehys nojaa pitkälti hollantilaisen Frank Geelsin tutkimuksiin sosio-teknisistä järjestelmistä ja rakenteellisten siirtymien monitasomallista (multi-level perspective). Kyse on kompleksisesta ja monitasoisesta järjestelmästä, jotka koostuvat kolmella tasolla ilmenevistä yhteisvaikutteisista elementeistä: makrotasoisista toimintaympäristön muutoksista, vallitsevasta toimintajärjestelmästä (regiimi), joka tarkoittaa vallitsevaa sääntöjärjestelmää käytäntöineen ja rakenteineen, sekä mikro-tason niche-innovaatioista. Yhteiskunnalliset rakenteelliset siirtymät (societal transitions) eivät synny yksistään regiimin sisäisistä sääntöjärjestelmän muutoksista, tai pitkän aikavälin muutoksissa toimintajärjestelmässä eikä radikaalien innovaatioiden synnystä vaan vuorovaikutuksessa näiden kaikkien kesken. Tutkimusongelmana olevaa makrotason ilmiötä tarkastellaan viiden tutkimusartikkelin kautta, joista jokainen tarkastelee eri puolia ikääntymisen muutoksessa mikrotasoisien tapaustutkimusten kautta. Artikkeleissa on käytetty eri tutkimusaineistoja, luonteeltaan sekä kvantitatiivista että kvalitatiivista.

Olellaisia tekijöitä siirtymässä regimistä toiseen ovat toisiinsa vaikuttavat prosessit toimintaympäristön tasolla, vallitsevan toimintajärjestelmän tasolla ja uusien kokeilujen tasolla. Toimintaympäristön tason muutospainet, kuten väestön ikääntyminen, horjuttavat vallitsevaa toimintajärjestelmää. Regiimin horjumisen avaa mahdollisuuksien ikkunoita regiimin ulkopuolella tai rajapinnoilla syntyneille uusille kokeiluille (niche-innovaatioille), jotka kiihdyttävät siirtymäprosessia. Muutosta hidastuttavat erilaiset regiimin stabiliteettia ylläpitävät lukkiumat ja muutosjäykkyydet.

Väitöskirjassa sovelletaan konstruktionistista näkemystä yhteiskunnasta, tukeutuen pitkälti Anthony Giddensin strukturaatioteoriaan. Strukturaatioteoriassa keskeistä on rakenteiden kaksinainen luonne. Muutos tapahtuu toimijoiden ja rakenteiden välisessä vuorovaikutuksessa: toimijat käyttävät rakenteita (resursseja ja sääntöjärjestelmiä) tilanteissa toimimiseen, mutta samalla uusintavat niitä toiminnassaan. Koska teknologia ja muut materiaaliset aspektit ovat osa sosio-tekniistä systeemiä, väitöskirjassa lähdetään siitä, että myös nämä ovat osa strukturaatioprosessia.

Tutkimuksen tulokset osoittavat, että monensuuntaiset suhteet taloudellisten, kulttuuristen, teknologisten ja institutionaalisten tekijöiden kesken, samoin kuin toimintaympäristön muutosten, paikallisten ja vallitsevan toimintamallin käytäntöjen ja sääntöjärjestelmien kesken ovat hyvin kompleksinen, dynaaminen ja monitasoinen sosio-tekniinen ilmiö. Ikääntymisen regiimille paineita luovassa toimintaympäristössä vaikuttavat kolme keskeistä megatrendiä: demografinen väestönmuutos, maailmantalouden muutokset ja teknologian kehitys. Näiden vaikutuksesta ikääntymisen regiimin vallitseva toimintatapa kokee paineita esimerkiksi markkinoiden ja kuluttajakäyttäytymisen, ikääntymis- ja innovaatiokäsitysten sekä terveydenhuollon ja muiden palvelujen tuottamisen ja organisoinnin tapojen muutoksille. Nämä vaikuttavat toinen toisiinsa: esimerkiksi vallitsevat ikääntymis- ja innovaatiokäsitykset heijastelevat poliittiseen päätöksentekoon, yhteiskunnallisiin rakenteisiin ja organisointimalleihin, teknologiaan ja tietellisiin käsityksiin sekä toisinpäin. Teknologia sosio-tekniisen regiimin osana vaikuttaa esimerkiksi ikääntymiskäsitysten tuottamiseen ja uusintamiseen: mikä näkyy esimerkiksi siinä, että tuotteiden fyysiset ominaisuudet asettavat rajoituksia ja mahdollisuuksia niiden käytölle.

Mikrotason muutoksia, niche-innovaatioita, kuten uudenlaisia palveluita, organisaatiomuotoja ja teknisiä uudistuksia, tarvitaan myös osana yhteiskunnallista rakennemuutosta. Nämä radikaalit uudet, kokeelliset innovaatiot voivat päästä avautuvien mahdollisuuksien ikkunoiden kautta laajempaan tietoisuuteen ja osaksi regiimiä suotuisien olosuhteiden seurauksena; esimerkiksi jos regiimi horjuu toimintaympäristön muutosten vaikutuksesta. Ikääntymisen muutos tapahtuu siis ensinnäkin tasojen välisessä dynaamisessa vuorovaikutuksessa, johon voidaan jossain määrin toiminnassa vaikuttaa. Lukkiutumien murtaminen ja mahdollisuuksien ikkunan hyödyntäminen muutoksen ja innovaatioiden aikaansaamiseksi vaatii toimijoilta tiettyjä kyvykkyyksiä ja aktiivista toimintaa, kuten dynaamisia kyvykkyyksiä ja etäisyyksien (erilaisuuden) hallinnan työkaluja.

Toiseksi, muutos tapahtuu regiimin sisäisissä sosio-tekniisissä neuvotteluissa, teknologisen ja sosiaalisen välisessä vuorovaikutuksessa, mikä ilmentyy teknologian käytössä. Teknologian käyttöön sisältyy pieniä tilannekohtaisia käsikirjoituksia (scripts), jotka osaltaan muodostavat laajempia yhteiskunnallisia käsikirjoituksia (esimerkiksi vanhuuden määrittelyä

yhteiskunnallisella tasolla), jotka vuorostaan vaikuttavat innovaatio- ja ikäpolitiikkojen määrittelyyn.

Kolmanneksi, muutosta voidaan saada aikaan aktiivisella monitoimijaisten innovaatioverkostojen rakentamisella. Tässä olennaiseksi nousee etäisyyksien hallinnan rooli eri taustoista tulevien toimijoiden kommunikaation fasilitoijana, sekä regiimin horjuessa syntyvien mahdollisuuksien ikkunoiden avaaminen regiimin ulkopuolelta tuleville nicheille.

Väitöskirjalla on sekä teoreettista että käytännöllistä merkitystä. Tutkimus kytkeytyy rakenteellisten siirtymien tarkasteluun toimijakeskeisestä näkökulmasta, avaamalla ikääntymisen monialaisen ilmiön monensuuntaisia sosioteknisiä prosesseja, mistä ei ole juuri tehty systemaattista tutkimusta. Tutkimuksen keskiössä eivät kuitenkaan ole makrotasoinen muutoksen koordinointi ja johtaminen vaan pikemminkin vähittäisten, pienten elementtien ja rakenteistumisprosessien tarkastelu, jotka vaikuttavat siirtymiin vähitellen. Näiden pienten, arkipäivän asioiden merkityksen ja näihin vaikuttamisen korostaminen lisää myös tutkimuksen käytännön merkitystä.

Avainsanat: Ikääntyminen, innovaatio, yhteiskunnalliset rakenteelliset siirtymät, monitasomalli

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Article 1: Pihkala, T., Harmaakorpi, V. and Pekkarinen, S. (2007). Dynamic capabilities and social capital in breaking socio-institutional inertia in regional development. *International Journal of Urban and Regional Research*. Vol 31:4, pp. 836-852.

Article 2: Pekkarinen, S., Hennala, L., Harmaakorpi, V. and Tura, T. (forthcoming). Clashes as Potential for Innovation in Public Service Sector Reform. Accepted to be published in *International Journal of Public Sector Management*.

Article 3: Pekkarinen, S. (2005). Turvapuuhelin vanhuutta rakentamassa. *Gerontologia* Vol 19:3, pp.121-129. (In Finnish)

Article 4: Pekkarinen S. and Melkas H. (2010). Safety alarm systems and related services: From potholes to innovation opportunities. *International Journal of Service Science, Management, Engineering, and Technology*. Vol 1:4, pp. 53-70.

Article 5: Pekkarinen, S. and Harmaakorpi, V (2006). Building Regional Innovation Networks: Definition of Age Business Core Process in a Regional Innovation System. *Regional Studies*. Vol. 40:4, pp. 401 - 413.

Contribution of the author to the research articles:

Article 1: The author formulated the framework of the study and research setting together with other authors, and wrote the paper together with other authors

Article 2: The author was responsible for formulating of the research problem, collecting and analysing the data and writing most of the paper

Article 3: The author is sole author: responsible for all phases of the study and writing of the article

Article 4: The author formulated the research problem together with another author, collected data and conducted the analyses of the qualitative customer data, wrote the paper together with another author

Article 5: The author was responsible for conducting the survey, collecting and analysing the qualitative data together with another author and writing the paper together with another author.

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Lahti, January 2011

Satu Pekkarinen

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PART II: PUBLICATIONS

PART I: OVERVIEW OF THE DISSERTATION

1 INTRODUCTION

1.1 Overview of the study

Ageing of the population has made society conjure up future visions of the effects of this phenomenon. Horror scenarios are making younger generations afraid that they will never be able to retire because of a diminishing workforce, and having to pay the costs of the baby boomers' care and retirement, while the age cohorts are getting smaller all the time. On the other hand, a lively discussion has arisen about the promising opportunities offered by the intellectual and material resources that the elderly possess, and also innovation activity related to ageing, in the form of assistive technology and various services, that has created promising opportunities for the business sector.

So far, the issue of ageing has been strongly related to the public social and health sector. When thinking about innovations related to ageing, the most common association is maybe the development of health-care technology. Innovations related to ageing, however, can be studied as a far broader phenomenon than technology, partly because of the widened concept of innovation. Changing perceptions of innovation has affected the products and services related to ageing. Technology can be studied as a socio-technical system, where social and technical aspects are mutually interrelated. Innovations of ageing are, admittedly, closely connected to the discussion of innovations in the social and health sector, as well as to technology, but this study points out that there are also other elements intertwined. Likewise, ageing itself as a societal phenomenon is changing. As a powerful megatrend it affects all fields of Western society, and it is estimated it will shake the foundations of society as such (e.g. Kunz 2007). The perceptions of ageing are widening and changing, which are manifested, for example, as contradictory expectations and practices related to older people in society. From the point of view of innovation activity, this means that innovations related to ageing can be studied from the perspective of both challenges and opportunities.

In this dissertation, I will study the *question of the ageing of the population and its links to the social, institutional, material and cognitive structures of society*. I deal with ageing as an emerging and reinforcing "regime": a change from the public social and health care sector orientation, which has supported the image of old age equated to illness and the need for increased care, to a more holistic orientation, which sees ageing in the context of the socio-technical system. The starting point is that ageing as a powerful megatrend has wide, interrelated societal effects and can be studied through the dynamics between different elements in society. The case studies in this study were conducted in Finland, but many of the elements can be recognised in other Western societies.

The aim of this study is to analyse the dynamics of the regime of ageing and the ongoing transition from one regime to another. Transitions are complex and socio-technical by nature, involving technological discontinuities and mutually interrelated social, political, cultural, infrastructural and economic changes (Geels 2004b). Technological development affects the

regime change of ageing, but also the emergence of a widening concept of innovation and more versatile perceptions of ageing and old age form the elements of change. This may also be seen when studying technological devices related to ageing, such as safety alarm systems in this study. Although the question here is about developing the technology for the elderly, the related innovation processes cannot be merely technology-driven by nature. Social, organisational, process and marketing innovations, combined with technology, are significant parts of the innovation activity related to the ageing of the population. Creating innovations in the social and health sector also mean breaking traditional boundaries and the meeting of various types of knowledge. (Hämäläinen 2005.)

The term ‘socio-technical regime’ refers to the semi-coherent web of rules, meaning both the commands and requirements and the roles and practices that are being established (Geels 2005; Kemp et al. 1998). This dissertation describes how the ageing of the population together with other long-term level changes is destabilising the regime, which is seen, for instance, in the lack of clarity in belief systems as ageing appears to be an ambivalent phenomenon. The studies of the socio-technical regimes and transitions are often said to be “evolutionary” or “functionalistic”, with the idea that certain niches have their breakthrough under certain selection pressures (e.g. Smith 2005; Smith and Stirling 2010). That is why there is such interest in purposeful transitions and transition management (e.g. Smith et al. 2005, Smith and Stirling 2010; Rotmans et al. 2001, Loorbach 2007).

This dissertation has both theoretical and practical contributions. This study participates in the discussion of action-oriented view on transition – the role of agency in this process, the lack of which Geels’ original model has been criticised in some contexts (e.g. Genus and Coles 2007;2008, Smith et al, 2005; Smith and Stirling 2008). The focus of this study, however, is not on the large-scale coordination and governance, but rather on opening up the incremental elements and structuration processes, which contribute to the transition little by little. The contribution of this dissertation to the the field of ageing studies, is the opening up of the socio-technological, co-evolutionary, processes of the multi-faceted phenomenon of ageing, which is the the basic scenario produced by social gerontology. In the present post-traditional society, old age is on motion, both in the practical and theoretical levels. (Jyrkämä et al. 2009.) This study aspires to opening this motion. As well, it is generally noted that ageing of the population causes different kind of macro-effects to the society and economy, still there are hardly any studies of the interaction mechanisms between different aspects. There are studies with calculations about economic consequences of ageing, i.e. impacts of ageing to the market, the use of social and health services etc (e.g. Lassila et al. 2007), but these studies typically neglect other interrelated elements i.e. cultural beliefs, development of technology, public policies etc. With regard to the field of innovation systems the contribution is to include the creation and use of technologies and also other type of innovations as part of innovation systems. Besides the theoretical aspects the study also strives to illustrate in practice how to govern the change and utilise the innovation potential lying in collisions and distances with “distance management” and the tools of brokerage. In the dynamics of change, distances between actors and levels have a great potential, when managed.

The study consists of five original publications being separate sub-studies with separate focuses and research questions, but which describe the various aspects and interrelations of the dynamics in the framework of the socio-technical transition in the field of ageing. In each article, the elements and relationships described are fewer and thematically focused, but in

this summarising article these elements of the articles are brought into a multi-directional study and into broader context. The use of empirical case studies in the macro-level study connects the macro-study into practices, and empirical world. The sets of data have been collected in various research and development projects. This study began in the early 2000s, when the discussion about the effects of ageing had just begun to gain ground.

This summarising article does not just present the results of the articles, but also tries to make more far-reaching conclusions about the articles applied in the context of socio-technical systems. The articles act as sub-studies describing the mechanisms and relationships in the socio-technical change at different levels and from different points of view. The articles present thematic entities describing the elements included in the transition: Articles 1-2 describe the ability of regions and organisations to respond to the changes in the landscape, Articles 3-4 describe the use of technology producing and reproducing belief systems as social structure, and finally, Article 5 is a case study in building innovation networks connecting different kinds of knowledge.

1.2 Phenomenon of ageing studied in the context of socio-technical systems and regimes

In this study, the question of ageing is studied as dynamics between the pressures set by ageing of the population, and socio-technical systems, mainly leaning towards Frank Geels and his colleagues' studies on socio-technical systems and multi-level perspective on transitions. (e.g. Geels 2002; 2004a; 2004b; 2005; 2006; Geels and Schot, 2007; Geels and Kemp 2007). This perspective offers a holistic view of change, and explains the societal transition as a co-evolutionary process with various elements and aspects intertwined. It coheres interestingly well with the study of the phenomenon of ageing, which has been understood to be in the phase of change and touching many fields of society, but the mechanisms of which have not systematically been analysed.

A framework of socio-technical systems differs somewhat from the most common innovation system approaches. According to Geels (e.g. 2004b), the approaches of national, regional and sectoral innovation systems mainly focus on the production side where the innovations emerge. The main focus on innovation systems seems to be the functioning of the systems (a network of companies, universities, research institutes etc), but, according to Geels, the change of the system has largely been ignored (Geels 2005, 7). Furthermore, they pay little attention to the user side; the diffusion and use of technology, impacts and societal transformations. To incorporate the user side explicitly in the analysis, Geels (2004b) widens the analytical focus to socio-technical systems, which encompass production, diffusion and the use of technology that are interrelated and mutually dependent in practice. Socio-technical systems consist of a cluster of elements, involving technology, markets, user practices, public policies and regulations, infrastructure, maintenance networks, supply networks, symbolic and cultural meaning and scientific understanding. (Geels 2004a; 2004b, 2005). This cluster of elements is called a socio-technical system, thus stressing that social and technical aspects are strongly interlinked (Geels 2004a, 2005). The change in these systems is about the co-evolution of technology and society (Geels 2004b). Geels deals with

the question of agency by noting that socio-technical systems do not function autonomously, but are the outcome of the activity of people. Socio-technical systems are maintained and changed by people's activities, but on the other hand, they form a context for actions. These actions are like moves in a game, in which the rules alter somewhat while the game is being played. (Geels 2004b.)

Studying the question of ageing as a socio-technical system, it should be noted that socio-technical systems can exist at different levels, for example, at an organisational level, as well as at a societal function level, like transportation, communication and health care (Geels 2004a). Technology plays an important role in fulfilling societal functions, but the functions are fulfilled only in association with human agency and social structures. (Geels 2004a, 19). The question of ageing and the regime of ageing is closely related to health care or elderly care (as societal function), but new views on ageing stress that older people are a versatile group including the positive aspects of ageing (see Chapters 2.1 and 4) and are not just something that should be taken care of. For this reason, to accentuate the multi-dimensionality of ageing, I prefer using the term "regime of ageing" instead of "regime of elderly care" in this dissertation.

Positive aspects of ageing include new lifestyles and appreciations. The new concept of "elderly care" is a wider issue than just medication and housing arrangements, and includes the "experience industry"; for instance travel, culture and sports activities, which have traditionally been omitted when talking about products and services for the elderly. However, these are worth including since more attention is being paid to the resources of the elderly: increased free-time, wealth and health (see e.g. Koskinen 2004; Laine et al. 2009). With regard to the service system, the question is therefore not only about the public sector burden, but also about private sector opportunity, and so co-operation models between the sectors will increase. Functioning of technology is dependent upon its relationship to other elements, such as regulations, user practices and markets, cultural meanings, infrastructure, maintenance networks and supply networks. (Geels 2004a). Innovations of ageing are something that crosses the sectoral boundaries of society. This stems from the idea that organising the societal functions should be thought of as something other than "sectoral silo" thinking (e.g. health care, transportation), but rather, for example, based on some phenomenon or customer group.

Socio-technical systems encompass production, diffusion and use of technology, and consist of artefacts, knowledge, capital, labour, cultural meanings etc. (Geels 2004b). The stability of existing socio-technical systems occurs through interaction between the material aspects of the system, embedded actors and organisational networks, and the rules and regimes that guide perceptions and actions. When the rules carried out by different social groups are linked to one another, this results in coordination of the activities of different social groups. (Geels 2005) Socio-technical regimes account for the stability of existing socio-technical systems. (Geels and Kemp 2007; Schot and Geels 2008) Some socio-technical systems are embedded more robustly than others, in the sense that they enjoy greater institutional support, larger economic significance, more supportive infrastructures, better integration with other social practices, and broader political legitimacy. These strongly embedded, self-reinforcing systems are referred to as 'socio-technical regimes' (Rip and Kemp, 1998; Smith and Stirling 2010) The term 'socio-technical regime' is an extended version of Nelson and Winter's (1982) technological regime, which is compared to Dosi's (1982, 1988) work on

technological trajectories and technological paradigms. These refer primarily to the beliefs and prevailing successful designs which predispose innovators towards certain marketable, feasible options, and which is broadened by arguing that scientists, policy makers, users and special interest groups also contribute to patterning technological development. (Bijker 1995, Geels and Schot 2007; Genus and Coles 2007; Genus and Coles 2008).

Socio-technical regime refers to the semi-coherent web of rules that guide and orient the activities of social groups, including scientists, users, policy makers and societal groups, which interact and form networks with mutual dependencies. (Kemp, Schot and Hoogma 1998; Geels 2005; Geels and Kemp 2007, 442). The rules can include the rules in the market, the user requirements and governmental rules (Kemp et al. 1998). The degree of alignment or tension in the web of rules is an indicator of the stability of links in socio-technical systems. In stable systems, the rules are well adjusted and the incremental changes are aligned and go in the same direction. (Geels 2005, 86). The socio-technical regimes stabilise existing trajectories in many ways: cognitive routines, regulations and standards, adaptation of lifestyles to technical systems, investments in machines, infrastructures and competencies (Geels and Schot 2007). Regimes do not fix technological choices, but are open to change in regime components and the overall architecture according to changes in social needs, technological possibilities and organisational change (Kemp et al. 1998)

However, e.g. Smith and Stirling (2008) note some ambiguity and confusion in the literature regarding the terms socio-technical system and socio-technical regime. Markard and Truffer (2008) noted a tension between institutional understandings of socio-technical regimes, which consider them a rule set or grammar (Geels, 2004b), and more material understandings that include the actors and artefacts whose practices develop the rule set (Verbong and Geels, 2007, Smith and Stirling 2008). In my view, it is useful to include materiality and artefacts within our understanding of socio-technical regimes by noting that technologies can lead on to structural and institutional changes and new rules. (See more chapter 9.2 about socio-technical relationships in safety alarm systems) My starting point with regard to the conceptual difference between socio-technical systems and regimes is that socio-technical systems mean the entity of elements taking part in producing a societal function (e.g. elderly care), and a socio-technical regime is a prevailing way, a set of rules under which the socio-technical system is functioning (see also Lovio and Kivisaari 2010).

Sometimes, however, the stability of the regime may destabilise because of the changes in the socio-technical landscape. Socio-technical landscape refers to aspects of the exogenous environment that is beyond the direct influence of the actors. It may include aspects such as economic growth, broad political coalitions, cultural and normative values, environmental problems and resource scarcities. Landscape –level changes usually take place slowly, but may exert pressure on the regime. System changes occur through the interplay between macro-level landscape changes, meso-level regime changes and micro-level “niche” novelties born outside or on the fringe of the existing regime (Geels and Schot 2007). Regime dynamics may take place also through multi-regime interaction, meaning interaction between two or more associated socio-technical regimes (Smith et al. 2010; Raven and Verbong 2007; Konrad et al. 2008)

In this dissertation, I will argue that there are various dynamics in the field of ageing in different fields and levels of society. There appear to be collisions between fields and levels in

this turbulent situation and there are many distances to consolidate, but the collisions and distances can act as platforms of innovations, and play a decisive role in the direction of ageing regime change. Societal stability is based on shared rules and meanings and reproducing these rules, but when there are landscape changes, the old rule systems are not necessarily working any more and must be questioned. Therefore, the change is not functional, but takes place in action and rule-making and rule-breaking. I will argue that there is room for guiding and governing the change in and between the levels. As a crucial factor, the concept of “distance management” is taken, which accentuates the potential of distances and collisions in transition management, which means exploiting the potential of collisions as a source of innovation.

The structure of this summarising article is as follows: First, in Chapter 2, I will go through the issues of ageing of the population, the changing structure of the health care, and technological development related to ageing as landscape changes and as a background of the problem. In Chapters 3 and 4, to understand the central changes in the belief systems in the field of ageing, as a regime, I will discuss the changes in the concept of ageing and the changes in the concept of innovation, which will help to understand the starting points of the socio-technical change. In Chapter 5, I will present the framework of transition theory: the multi-level perspective on transition and the concept of system innovation. This part also forms the theoretical background of my study.

In Chapter 6 I will define the research problem with the research questions, as well as research setting and positioning of the original publications in the chosen framework. Chapter 7 deals with the research approach with ontological and epistemological remarks, and Chapter 8 presents the sets of data and analysis methods used the original publications. In Chapter 9, the results of the study are presented in the context of a multi-level perspective on transition. In Chapter 10, I will make some final conclusions about the study. Chapter 11 discusses the state and direction of change in the issue of ageing in Finland. Finally, in Chapter 12, I will make some critical reflection about the study.

2 CHANGES IN THE LANDSCAPE

2.1 Ageing of the population and its positive and negative impacts

Ageing of the population occurs in the industrialised societies and in all fields of society. Finland is the most rapidly ageing country in Europe - Japan being the most rapidly ageing society worldwide - and this has a significant structural and economic impact (Luoma et al. 2003; Kunz 2007). It is estimated that the number of Finnish people over 75 years old will have doubled by 2040 (Statistics Finland 2007). The ageing of the population together with the difficult economic situation of Finnish municipalities means both an increase in the need for services and a decrease in the workforce because of retirement.

The ageing of the population in Finland is caused by the baby boom generation getting older (Jyrkämä et al. 2009) The discussion about population ageing therefore ends in many ways with the baby boom generation and is somewhat pessimistic in its interpretation. (Karisto 2007, 102) The phenomenon has been described, for example, as “apocalyptic demography,”

“age shock” or “gray wave” (Jyrkämä et al. 2009, 147) and the debate is dominated by “a burden” or even “crisis” (Karisto 2007; Healy 2004) interpretation: the focus is on the pension explosion and on the care burden, which is expected to become unbearable when boomers grow old. The care burden is affected by the changes occurring in people’s health and capabilities.

The traditional picture of old age also stresses seeing old people characterised by losses, inevitable decline of the body, illnesses, restraints and disengagement, leading to an increased need for care that increases the cost to society. From the point of view of innovation, this can be called the *Old age as a burden* point of view. Therefore from this point of view, innovations include encouraging productivity and minimising the growth in health expenditure in the public sector and, for instance, assistive technology that should “repair” or compensate for the losses that ageing causes.

However, the scenario calculations are often based on mechanical and simplified assumptions, not taking into account all the interrelating aspects, like the possible development of medical sciences and technologies, immigration or rise of the education level (e.g. Kiander 2009.) Reduction of the workforce may also encourage and force work reorganisation (Kiander 2009, Saxen 2009) The pressures for an increase in public expenditure are also influenced by factors other than ageing, like the employment ratio and productivity growth. The care burden for society can also be relieved by the fact that most elderly care is family care, and it is expected to increase. Therefore, it is also said that the rhetoric of ageing being a huge unparalleled challenge is grossly exaggerated. (Kiander 2009, 99.) On this basis, a counter-discussion maintains that ageing should not be equated with decline, disability and dependence. Despite a strong public focus on the negative aspects of the phenomenon, ageing of the population does not mean an utter disaster caused by increased retirement, but brings with it new opportunities and positive challenges. (Karisto and Konttinen 2004; Healy 2004; Kunz 2007). Studies show that boomers reach retirement age healthier than previous cohorts (Sihvonen et al. 2003; Martelin et al., 2004; Karisto 2007). Furthermore, the compression theory suggests that the prolongation of age itself does not dramatically increase care costs, because illnesses seem to be mainly in the last years of life irrespective of life expectancy (Karisto 2007; Kiander 2009). It seems that the elderly are in better condition at least until they reach the age of 80, after which there is an increased need for help. (Vaarama 2009) It should also be remembered that increased longevity is something worth pursuing and supporting (Karisto and Konttinen 2004).

There has been a discussion about the heterogeneity of older people – older persons differ significantly from each other regarding, for example, their health, wealth, behaviour and lifestyle, just like other age groups. The remarkable positive impacts of ageing have been discussed only recently, and this might be mentioned as a change in the cognitive rules in a regime, that might have wider impacts. The positive side of ageing of the populations is that it has meant in particular an increase in the number of years people can expect to be active in their old age (e.g. Karisto and Konttinen 2004). The later years can therefore be perceived as an active, autonomous and independent time of life, in which maintaining the earlier life-style or engaging in new activities are considered to be the central ways of growing old. From this point of view, the elderly are not merely consumers of society's resources. From the point of view of innovation, *Old age as an opportunity* is connected to seeing old people as active consumers (e.g. Kohlbacher and Hang 2007; Kohlbacher and Herstatt 2008) and active

participants in society (Koskinen, 2004.). Innovations related to, for example, the consumption of services and free-time products (such as travel, sports and cultural activities) are emphasised in this point of view.

The distribution of how time is spent in society changes as the share of pensioners grows (Kautto 2004). Increased leisure time leads to different forms of participation, in non-public sector activities or other voluntary activities, but participation may also include involvement in the design and planning of products and services. The resources that older people possess has been discussed emphasising that older people have social, political and economic resources and strengths, as well as resources related to values, life experience, increased free-time and liberty. (Koskinen, 2004.) This is also visible in the social expectation that the elderly are increasingly independent in their daily activities with as little care as possible (see, e.g. Leinonen 2006, 9). Old age as a resourceful time is connected to seeing old people as active, participating actors in the innovation processes. When the elderly are seen as productive, they are not only targets of services planned by professional experts, but they have resources and expertise that can be exploited when planning products and services. (see Hennala et al., forthcoming).

Gilleard and Higgs (2005, 153) note: "Past habits of consumption constrain future opportunities." Ageing is a generation-related phenomenon: the baby-boomers, born during and after the Second World War¹ in 1945-1950, have different generational experiences than their parents, for example, being the first youth culture generation in the fifties and sixties (Karisto 2005). "Those who grew up spending freely earlier in life are more likely to continue to spend freely later in life". (Gilleard and Higgs 2005; see also Karisto 2007) This implies that who are used to consuming when young and healthy will continue doing so, as they get old and, perhaps, sick. From this point of view, ageing can have many positive impacts as an opportunity to create new businesses, for example. One particularly essential implication of the demographic shift is the emergence and constant growth of the "graying market" or the "silver market" that can be very attractive and promising, although still very underdeveloped in terms of product and service offerings (Kohlbacher and Herstatt 2008, xi; Usui 2008). Innovations related to the consuming of services and free-time products (such as travel, sports and cultural activities) are emphasised. Demand and new markets will be created especially for assistive devices, safety-related products, products that promote health, as well as services: wellbeing services, hobbies, leisure time products, travel and culture (Kautto 2004, 15). The demand becomes more quality-oriented and specialised, since the elderly are a very heterogeneous group just like other age groups.

This implies that the baby boomer generation is projected to be more educated, healthier, wealthier, more active and more productive and used to consuming than preceding generations (e.g. Healy 2004; see e.g. Leinonen 2006, 9). Hjerpe et al. (1999) estimated that the pension purchasing power will grow considerably, so that even pensioners receiving an average pension will be able to pay for a larger share of the production costs of the social and welfare services. Upon retirement age, households are typically at their wealthiest. However, studies of income and the consumption patterns in Finland show that Finns start saving instead of consuming when they retire. One explanation could be insecurity about social security and getting prepared to risks. (Kiander 2009.) As well, it should be noted that many

¹ There are several definitions of the birth years of the baby boomers in Finland, but the peak of the births was the cohort born in the late half of 1945-1950 (Karisto 2005).

of those women who are over 75 year old and who live alone are at a high risk of poverty. Two thirds of those who earn only the basic pension are women. (Niemelä and Ruhanen 2006.) As an increasing number of women are participating in the working life, the situation is improving. Women still outlive the men (for women the average life expectancy was 82,9 years in 2007 in Finland, and for men 75,8 years), but the gap is narrowing all the time (Vaarama 2009).

2.2 Changes in the global economy and its impacts on the social and health care service production

The global economy has experienced a radical change, which has had impacts on the increasing pressures to increase productivity of societies. During the last two decades, for instance the health care systems of most developed countries have faced pressures for major reform emphasising economic efficiency, cost-containment as well as public involvement and consumerism. (e.g. Tritter et al. 2010). Pressures towards reformulating the service production and improving productivity in public services is emphasised in the national level policies and strategies also in Finland. The goal set by the Finnish government is to turn around the declining productivity of the public sector and relieve the extensive pressure on public expenditure in order to maintain a satisfactory municipal service system.

This has meant applying completely new operating models influenced by the private sector, but their application in the present environment is not without problems, because of differing logic of the sectors as well as certain past habits and ways of thinking. The publicly stated long-term objectives of Finnish health policy have been to achieve the best possible health for Finns and to reduce disparities in the health of different social groups. In its institutional structure, financing and goals, the Finnish health care system is closest to those of other Nordic countries and the UK, in that it covers the whole population and its services are mainly produced by the public sector and financed through general taxation. Besides primary and specialist health care, the municipalities are responsible for other basic services, such as nursing homes and other social services for the elderly, child day care, social assistance and basic education. (Häkkinen 2005.) In Finland, the public sector has traditionally produced the social and health care services itself as a result of political decision making. However, since the early 2000s there has been an increasing emphasis on productivity and competitiveness in economic and social policy (Kananen 2008; Niemelä and Saarinen 2009). According to the law, municipalities are only responsible for arranging services for the inhabitants, not producing them (Valovirta and Hyvönen 2009, 6). New ways of producing services include privatisation of services, purchaser-producer models and outsourcing. The trend where the share of public services is getting smaller and the new operations are increasing has become stronger in recent years. The central aim of the public sector renewal in the current decade has been to increase productiveness and efficiency, secure availability of services and increase economic growth, competitiveness and employment. (Niemelä 2008, 47.) The public-private mix has been discussed in Finland with the idea of getting ever more customers to private sector services.

At the same time while organising the public services has become more versatile in recent years, there have been renewals in the public administration also in the spirit of the New Public Management paradigm with ideas imported from the private sector to public organisations; for example, quality management, customer satisfaction measurement, decentralisation of management authority, creation of quasi-market mechanisms and cost control (Skålen 2004, 251; Forma et al. 2007). Consumer sovereignty is one key element in the New Public Management. The theory behind the New Public Management is that responsive to consumer preferences is an important way to improve public services and increase organisational effectiveness (Aberbach and Cristensen 2005).

However, those opposing the ideas of New Public Management and consumerism state in their critique that when private sector principles are implemented unchanged to the public sector, problems are bound to emerge (*e.g.* Jung and Osborne 2009; Eräsaari, 2006). When a model that is known to work in some context is transferred into a new context, there is a danger that not everything will fulfil their role in the new environment. For instance, while in the private sector procurements are done only if they are seen as profitable, in the public sector procurements are regulated by procurement legislation. This may actually cause ineffectiveness and increase bureaucracy, even though the aim was opposite (Eräsaari 2006.)

The new ways of organising the public services has also affected the role of the service user in terms of involvement. Traditionally in the public sector, especially in the old style welfarism model, the services are presented *to* the users, not produced *for* the users and not by working with them in partnership. (Jung and Osborne 2009, Evers 2006). Such a model has been characterised by high-level professionalism and there has been little room for diversity and individual and agency-related user involvement. Old style welfarism is characterised by unquestioned professional and administrative authority. (Evers 2006.) In this context it must be noted that differences between countries are huge: the welfare state model in the Nordic countries is different from that of Central Europe, for instance (see *e.g.* Esping-Andersen 1990).

The users of the Finnish health care system have lacked the consumer-oriented behaviour model (Tuorila 2007). The new models have created a discussion about the role of the service user being a customer or, even consumer, instead of passive patient or client (about the terminology, see *e.g.* McLaughlin 2009) Also in the social and health policy discussion, active customers and consumers have replaced the general public as actors. (Toivainen 2007) 'Consumerism' is a term that has been used to describe the user's choice and user-centredness and thus establishing competition among providers. (Evers 2006). In the social and health care, the term 'consumer' has been used in varied ways – it refers to the use of private health services, but in the context of the reorganisation of the public health care systems it can also refer to the user-centredness or the customer satisfaction or even the customer's freedom to make choices related to their care. (Toivainen 2007) Even though the consumerist ideology has been centred in principle in Britain and the U.S, and the choice of health services in practice is quite limited in Finland, where the user involvement has been mostly indirect (Tritter 2006; Tritter 2009; Tritter et al 2010), there are signs of the reinforcement of the ideology also in the Nordic countries (*e.g.* Tuorila 2007).

The consumerist agenda in public services challenges the core assumption of the relationship between the state and the citizen (Clarke et al. 2007). The consumer role has influenced the

citizenship role (Aberbach and Cristensen 2005), and made it more individualistic. The rights and responsibilities of citizens are very different to those of customers. (Windrum 2008, 16). "The notion of 'the consumer' identifies a relationship between individuals and their services, primarily with rights of exit supported by limited rights of voice [...] Apart from the right to be heard, consumers have the right to exit." (Callaghan and Wistow 2006, 584-585.) By contrast, the role of the citizen is based on the legitimacy of legal, political and social membership of the community. Citizen involvement is based on democratic principles and the aim of involvement goes beyond consumerist notions of individual satisfaction to ensure responsiveness and accountability in the context of public funding. (ibid.) The changes in the public sector include changes in expectations as citizens have become more sophisticated, and are now less prepared to accept 'given' public services passively, requiring greater focus on choice and quality in the provision of public services (Osborne and Brown 2005).

The customer-oriented approach does not fit with the established concept of citizenship (Aberbach and Cristensen 2005). According to Ryan (2001, 105), the problems associated with making citizens consumers can be identified within four main themes: 1) the extent to which this conceptualisation redefines the engagement of citizens in policy making - from interactive political engagement to passive commercial transaction 2) the emphasis based on the sovereignty of the individual vs. the public good 3) the limitations in marketing public goods, and 4) the simplistic voluntary market approach towards the relationship between citizen and government. When the recipients of public services are seen as customers, balance is needed between individualised perspectives and the good of the community as a whole, and there is a danger that self-interest and personal satisfactions define the relationship to the state (Aberbach and Cristensen 2005; Callaghan and Wistow 2006). The policy that aims at broadening older people's responsibility is not easily perceived, for example, what it presupposes from legislation, the choices of people, market conditions and product development (Vanne 2009, 49).

Central to the concept of citizens as consumers is the notion that administration of service delivery can be isolated from policy making. (Ryan 2001, 105) There is a disagreement between democratic controls based on rules and regulations and market type controls based on consumer satisfaction (Windrum 2008, 15). The democracy aspect as a public sector principle leads to seeing the service user as an individual, who has the right to affect the decision-making politically. Now, however, when the customer-oriented approach has had a breakthrough in the public sector service development, at least at the ideological level, the discussion has been on more direct ways to enable the service users to participate in the service provision.

However, empowerment is not easy in the field of knowledge-intensive services, like health care. Consumer sovereignty and choice demand that the customer is well informed and knowledgeable. (Windrum 2008, 16) There is a great deal of controversy regarding the customers' roles and expectations. Consumerism is largely criticised due to its unequal effects, and has even been described as a "two-edged sword" (Bauman 1988; Gilleard and Higgs 1998). The opportunity to choose created by consumerism and the privatisation and commercialisation of care services of the elderly is seen as empowering and positive from the customers' perspective, but there is a risk that it can lead to further inequalities and even a polarisation of society (Gilleard and Higgs 1998; Jung and Osborne 2009; see also Vaarama 2009) Gilleard and Higgs (1998, 234) also note in the context of older people that "rhetoric

of consumerism attributes to all older people a position of agency, as users of scarce and targeted resources, they cannot fill". Chronic illnesses and material impoverishment, for example, hinder older people from exercising power in health care. Another problem is that consumers have insufficient knowledge or ability to make decisions (Ryan 2001, 106). Emphasising the participatory approach has been criticised for making the public believe they have rights and freedom of choice, but not offering instruments to exercise these. Another problem of consumerism in the public sector, looked at from another perspective, is related to services being funded by public money, and the question as to who decides about the use of public money.

2.3 Technological development and gerontechnology

The innovations of ageing are often associated with technology, and innovation in the social and health care is considered to be technology-oriented (Kivisaari and Saranummi 2008, 280), for example, assistive technology directed towards the elderly, like safety alarms, intelligent homes etc. For example, Väyrynen (2003) links innovations of ageing to 1) technology replacing the decreasing workforce 2) innovations supporting independent living and 3) innovations facilitating and increasing the efficiency of the care work.

The visions of technology in the elderly care are strongly based on the threat of a possible lack of qualified people in the future. The technology can be medical technology that helps prevent and cure illnesses, as well as the information systems in hospitals, but there is also the development of "smart homes" with various kinds of assistive technology (e.g. Melkas et al. 2008) Technology can be either active, such as safety alarm systems, robotics, image gramophone and smart walker, or passive, based on controlling and monitoring, such as video supervision, fall and movement sensors, sensor pads (beds, chair, floor), fire alarms, door alarms, dosers, medication reminders, smart clothing etc. (e.g. Winblad 2007, Raappana and Melkas 2009, Topo 2009) In addition, there are e.g. navigators, adaptive environment and smart architecture, smart clothing and smart walkers. (Winblad 2007.) The focuses of the future research related to gerontechnology include monitoring health and activity as well as pro-activity, pervasiveness and ubiquity of intelligent technology (ibid).

The technological development together with the ageing of the population is manifested in the implementation of the term 'gerontechnology' as a scientific branch. These two dynamic developments in society, the increasing preponderance of older people and the dynamics of technology, globalisation and the rapid spread of a multitude of new mass-products are occurring for the first time in history and in many countries. (Bouma et al. 2007) According to Bouma et al. (2007), the core of gerontechnology is the facilitation of the encountering and interacting of these two simultaneous and uncoordinated developments.

The term 'gerontechnology' is a composite of two words, gerontology (the scientific study of ageing and research) and technology (the development and design of new and improved techniques, products and services). The term was first introduced by Graafmans in 1989 at the Eindhoven University of Technology (Graafmans and Taipale 1998; Harrington and

Harrington 2000). It can be defined as a field “concerned with research, development and implementation of specific technologies for the purposes of the whole or sections of the elderly population” (Bouma 1998, 93) Gerontechnology refers to technology that fulfils the needs of an ageing society, and, more formally, to the interdisciplinary study of technology and ageing for ensuring good health, full social participation and independent living throughout life. (Harrington and Harrington 2000) Gerontechnology combines a scientific research approach and an application-directed approach. Scientific research is directed at learning to match the ambitions and needs of the elderly in their actual environments with suitable innovative or existing technology. (Bouma et al. 2009, 69)

The scientific side of gerontechnology combines the disciplines of ageing and innovative technology. The discipline of ageing includes physiology and nutrition, psychology and social psychology, sociology and demography and medicine and rehabilitation. Technology disciplines include chemistry and biotechnology, architecture and building, information and communication, mechatronics and robotics, ergonomics and design and business management. (Bouma et al. 2007, Bouma et al. 2009) Cross-fertilising these disciplines show that the applications, concepts and insights of gerontechnology are multiple. The field of gerontechnology emphasises that the environment in which people age includes the social and living environment, but also, essentially, the technological environment. Technology is an important driving force behind changes in the daily environment. Therefore, the environment in which people age cannot be taken for granted as a constant, but is an ever changing creation and an accelerating dynamic. (Bouma et al. 2009, 69) Gerontechnology has applied a system approach between a person and his or her technological environment, and the user-interface in between. Both the system and the user are dynamic: they are in constant change. (Bouma 1992.)

Along with technological innovations, a central question has emerged about what is achieved with the technology and what are its impacts. (e.g. Raappana and Melkas 2009, Hämäläinen 2005) Nowadays, it is generally agreed that technology also has social aspects connected with for instance usability and approval of the products. In assistive technology, like a safety alarm system, service is also included. The discussion about social innovations broadens the concept of innovation from technological innovations to systemic innovations, service and process innovations, innovations increasing wellbeing and health and innovations concerning the market of wellbeing and health (Hämäläinen 2005, 198–199). Technology in elderly care services has an impact on the customers as well as care workers (see e.g. Raappana and Melkas 2009).

Along with the broadening of the concept of innovation, the social and structural aspects of the innovations of ageing have also been taken into consideration. Instead of fostering separate technological innovations, more emphasis is placed on increasing understanding about how to promote the entity where services and technologies are intertwined. Innovations of the social and health sector are more often linked to the development of new models of action and services. At the same time, the simultaneous development of technologies and services has been considered central, because technologies and services create preconditions and requirements for each other. (Kivisaari and Saranummi 2008, 280) Gerontechnology not only means the development of technology to the needs of the elderly, but stems from the larger perspective that technological innovations also require social innovation and management and organisation of systems, structures and services. (Väyrynen 2003, 31).

In the next two main chapters I will examine the existing literature concerning widening the concepts of innovation, and also changes in the perceptions of ageing. This literature review describes the changes taking place at the regime-level of ageing and, together with the presentation of the multi-level perspective on transitions in Chapter 5, they constitute a theoretical and conceptual review of this dissertation.

3 MODERN APPROACH OF INNOVATION: WIDENING THE CONCEPT

The meaning of innovations has been strongly emphasised in several areas of life. The rapid change of the operating environment has resulted in a situation in which economic and social success is strongly dependent on structural reform and innovating ability (Hämäläinen 2007). Innovativeness is seen as one of the most important strategic abilities to hold up well in the rapidly changing environment and therefore as a central driving force of competitiveness and productivity (Stähle 1998; Schienstock and Hämäläinen 2001; Archibugi and Michie, 1995; Porter 1998).

The definitions of innovation typically include the idea that innovation differs from an idea or invention because of the demand of implementation (Schumpeter 1934). An invention is not innovation until it is brought into practice and proved valuable. According to some definitions, implementation means bringing the product to market and value means the market value, but according to the broad understanding of innovation, the value aspect can also be defined as social or human value. The main focus of innovation research has traditionally been concentrated on innovations related to technological innovation within manufacturing, reflecting that innovation theory has its roots in a time where manufacturing was still the major economic activity. This means that the social aspect of innovations has been left aside in technology policies and in the new growth theory. (e.g. Drejer 2004; Ruuskanen 2004.) The focus of innovation research has also traditionally been the study of radical innovations that are easily perceived. The definition of innovation has however been expanded (see e.g. Kline and Rosenberg 1986; Lundvall 1988,) which in turn has enabled and promoted the discussion on innovation activities, for instance, in services and in the social and health sector. Actually, the present concept of innovation is getting closer to the Schumpeterian view of innovations which covers five cases: 1) the introduction of new products or a new product quality; 2) the introduction of a new method of production; 3) the opening of a new market; 4) the conquest of a new source of supply of raw materials; and 5) the carrying out of a new organisation of industry (Schumpeter 1934, p. 66). This implies that Schumpeter recognised the process, market, organisational innovations in addition to product innovations. As Drejer (2004) argues, the service-specific studies and the synthesis approach, which sees service and manufacturing activities more intertwined, are in strict accordance with Schumpeter when they argue that innovation is much more than a technological product and process innovation.

3.1 The “awakening” of social innovations and system innovations

Widening the concept of innovation means that besides technological product innovations, there is a discussion on other views and classifications of innovations: for example, service, process, organisational, marketing, positioning, rhetorical, conceptual, administrative, governance and social innovations (see, e.g., Afuah 1998; Tidd et al. 2005; Hartley 2006; 2008; Ståhle et al. 2004). Along with the widening range of the classifications, there is quite a common view that these innovation types mean different conceptual perspectives on innovation, and do not exist as pure types. With regard to the modern concept of innovations as non-linear social learning processes, there has been discussion that all innovations are in fact social (see e.g. Pol and Ville 2009; Kline and Rosenberg 1986). Likewise, it is very difficult to imagine “pure” social innovations without their being embedded in their material contexts. Social innovations mean a significant expansion of the technology-based concept of innovation, but social innovations can also be strongly related to technology, for instance, communication technology or social media which create new forms of social practices (see e.g. Pohjola 2007).

Actually, the importance of emphasising social innovations is particularly shown in a period of radical change in the technological basis of the economy, when established organisational and institutional patterns may become obstacles to exploiting the full potential of the new technology (Lundvall 1988). Innovations of ageing fundamentally include social aspects (for example, related to values, acceptance, social relations) standing by the technological aspects, and that is why I take the concept of social innovation under more specific consideration.

In social sciences, the concept of social innovation has its roots in the studies of Peter Drucker and Micheal Young in the 1960s. However, the concept was not systematically utilised until the 1990s., and recently it has become more common in innovation system studies and in general studies of societal change. (Saari 2008.) Even though the concept is widely used, the concept of social innovation is however far from clear having a variety of definitions. Its contents have often remained undefined and abstract. Both words, “social” and “innovation” are ambiguous concepts and allow for many interpretations (Joutsenoja and Lindh 2004). Besides being said to stand by the technical innovations (Joutsenoja and Lindh 2004), social innovations have been considered in relation to business innovations with market value (Pol and Ville 2009).

If the concept of social innovation is broadly considered, it seems that it can be used to explain any individual and social development, or any social, economic and cultural action irrespective of time and place. (Joutsenoja and Lindh 2004) The broadest definitions of social innovation describe social innovation to be the ‘public good’, benefitting people or Earth (Centre for Social Innovation 2010), or improving the macro-level quality of life or extending life expectancy (Pol and Ville 2009). They can also be described as changes in the ways of thinking: changes in mental models and institutional and social norms that increase the renewal ability of society. A broad view of social innovation is also to define them as novel solutions to social problems with societal value (e.g. Phills Jr et al. 2008; see also Ståhle et al. 2004), or as new ideas that work in meeting social goals (Mulgan et al. 2007). In a somewhat narrower sense, social innovations are defined as changes in the cultural, normative or

regulative structure of society, which enhance the collective power resources of society and improve its economic and social performance (Heiskala 2007.) An even narrower definition is related to the reproduction of the institutional structure (organisations and their internal processes) of social and health policies. (Saari 2008) A more careful classification of social innovations was made, for example, by Pol and Ville (2009).

In the fusion model of social innovations, it is argued that social innovations do not exist as such and are disconnected, but are irreducibly intertwined to the economy and technology in networks. (Joutsenoja and Lindh 2004) This definition is close to the concept of systemic innovation understood at the operational system level (see Valovirta and Pelkonen 2010), which mean co-evolutionary changes in technologies, user practices, regulation, industrial networks, infrastructure and cultural meaning (Geels 2004a; 2005; see also Chapter 5 in this study). As renewals are simultaneously targeted at processes, services, structures, organisation and technology and the development, systemic innovation does not oppose the social and technological innovations, but recognises them as intertwined and interactive. (Kivisaari and Saranummi 2008, 280) The diffusion of system innovations may require changes in prevailing power relationships, in responsibilities between professions or organisations or new structures of production or financing, or all these together. (Kivisaari and Saranummi 2008, 280; Saranummi and Kivisaari 2009; 45).

Besides, on the operational system level, describing the broad societal-level changes (the main focus of this study), the concept of systemic innovation is also used at the levels of innovations and innovation processes. (Valovirta and Pelkonen 2010). At the level of innovations, the systemic nature of innovations means they are part of the system, related to other innovations. According to Chesbrough and Teece (1998), some innovations are autonomous, that is, they can be pursued independently from other innovations. In contrast, some innovations are fundamentally systemic, that is, their benefits can be realised only in conjunction with related, complementary innovations. (Chesbrough and Teece 1998). Another approach to system innovation is the systemic nature of innovation processes, which means a cyclical, non-linear and interactive model of innovation (see next chapter) processes.

3.2 From a science-based model of innovation to non-linear, open innovation

A recently proposed model for the management of innovation is based on the principles of open innovation (Chesbrough 2003). Open innovation is a paradigm that assumes that organisations can and should use external ideas as well as internal ideas and combine them to create value. (Chesbrough 2003; 2006, Paalanen et al. 2008; Elmquist et al. 2009). Open innovation means that customers, suppliers or other partners are integrated into the heart of the product development (Enkel et al. 2009). In the notion of open innovation and the interaction-based non-linear model of innovation, innovations are seen to emerge increasingly as deeply embedded in normal social and economic activities, and as interactive learning between organisations and their environment (Lundvall, 1992; Harmaakorpi 2004). In non-linear innovation, actors from varying backgrounds are typically involved, and multi-directional information flows are emphasised in creating and combining knowledge, which

makes the outcome innovation highly uncertain (e.g. Kline and Rosenberg, 1986; Edqvist, 1997; Lundvall, 1992; Dosi 1988; Harmaakorpi, 2004). The non-linear model of innovation assumes that innovations can be triggered by diverse causes, not just by research and development. Knowledge and technologies are combined in a new way, and innovations are often born on the boundary of areas of expertise.

The social network analyses by Burt (1992, 2004) and Granovetter (1973, 2005) have suggested that innovations are most likely to be found in 'weak ties' and 'structural holes' between dense network structures, because they enable the flow of new information to the system. (Burt 1992, 2004; Granovetter 1973; 2005). Melkas and Harmaakorpi 2008; Kallio et al. 2010) Structural holes are a correlate of an organisation's absorptive capacity (Cohen and Levinthal 1990, 128): "the ability of a firm to recognise the value of new, external information, assimilate it and apply it to commercial ends". Absorptive capacity means the ability to recognise the value of new, external information, assimilate it and apply it. (Burt 2004; Cohen and Levinthal 1990, 128; Kallio et al. 2010). Combinative capability (Kogut and Zander 1992) is also stressed (see Ruuskanen 2004). More novel information flows to individuals through weak than through strong ties. "Moving in different circles from ours, they connect us to a wider world" (Granovetter 2005, 34). Behaviour and opinions are usually more homogenous within than between groups, so people connected across groups are more familiar with alternative ways of thinking and behaving, which gives them more options to select and synthesise and is likely to produce new ideas (Burt 2004). The socially marginal may at times be better able to break away from established practice (Granovetter 1973; 2005) and this may lead to innovations. Innovation means breaking away from established routines. The person who sits astride structural holes in networks is well placed to innovate. (Granovetter 2005, 46.) Those who have relationships that span the structural holes between groups have a vision advantage in detecting and developing good ideas (Burt 2004, 389).

According to Granovetter, who introduced the concepts of strong ties and weak ties in social networks, "*the strength of a tie is a combination of the amount of time, the emotional intensity, the intimacy and the reciprocal services which characterize the tie*" (Granovetter 1973, 1361). One's strong ties form a dense network, one's weak ties a less dense one. Strong ties include common norms, common language and a high level of trust within a homogenous group breeding local cohesion. Weak ties are relationships between these groups and dense social networks.

Close to the idea of weak ties is the concept of a structural hole (Burt 1992; 2004). The term structural hole refers to the social gap between two groups. Structural holes often are the weak connections between clusters of densely connected individuals (Granovetter 1973; 2005). Networks with an abundance of structural holes create opportunities for the new combination and recombination of ideas. For example, cross-discipline groups of individuals can offer applications expertise from a variety of areas. This enhances learning opportunities, fresh thinking and promotes integration across traditional borders. According to Burt (2004, 349), the people who stand near the holes in a social structure have a better chance of having good ideas. People surrounding structural holes have different interests, perspectives and use different concepts and language (Parjanen et al., 2010).

From the point of view of innovation, the discussion about structural holes and weak links is related to the roles of *proximity and distance* in innovation. The main problem of utilising the

innovation potential in structural holes stems from the diversity or 'distance' between the innovating partners. This distance can take different forms; cognitive, communicative, organisational, social, cultural, functional or geographical distance (see e.g. Harmaakorpi et al. 2006; Harmaakorpi et al. (forthcoming). The main problems faced when spanning the structural holes can be tackled through this taxonomy (Parjanen et al. 2010).

Cognitive proximity refers to the shared ways of understanding, comprehending and evaluating the world. (Rallet and Torre 1999; Torre and Gilly 2000; Boschma 2005a, 2005b.) There are the apparent positive effects of proximity, but on the other hand, it has been persuasively argued that there is a phenomenon of “having too much proximity”, that is, a negative side of proximity, due to the problem of lock-in – meaning lack of openness and flexibility (see, e.g., Boschma 2005b; Tura and Harmaakorpi 2005, 1120; Parjanen et al. 2010). The possibility of the negative effects of proximity suggests that there are equally important conditions of innovation connected to the idea of physical, cognitive or functional distance or diversity between people. Cognitive distance, for example, reflects the fact that people interpret, understand and evaluate the world differently. (Rallet and Torre 1999; Torre and Gilly 2000; Boschma 2005a, 2005b.) When discussing the roles of proximity and distance in innovation, we thus face a critical dilemma: on the one hand, there is a need for mechanisms for enhancing the physical, social and cognitive proximity between the relevant actors of the innovation processes. On the other hand, mechanisms are needed for enhancing social and cognitive diversity, openness of the innovation networks and the ability of an innovation network to connect itself to the wider national and global knowledge base, that is, mechanisms to ensure sufficient distance between the actors. (Harmaakorpi et al, forthcoming).

Meaning of trust and social capital is often emphasised in the innovation networks. Proximity may, as noted, also have negative impacts. Therefore, as Tura and Harmaakorpi (2005) note, it is important to separate the two forms of social capital. Bridging social capital creates bonds of connectedness formed across diverse horizontal groups, whereas bonding capital only connects members of homogeneous groups (Granovetter 1985; Putnam 1995). This division of social capital into bridging and bonding types becomes crucial in assessing regional innovativeness, since both are essential to build an atmosphere of trust and proximity in each innovation network and keep them open to allow the necessary flows of information to take place. Bridging social capital, with the element of distance, is seen to be positive because it brings the individual innovation networks into trusting interaction enabling, for example, an increase in the absorptive capacity benefits of the structural holes of these networks. The bridging social capital is close to Burt's (2004) definition of the “social capital provided by brokerage”. (Parjanen et al. 2010.)

To conclude, there is an interplay between proximity and distance in innovation. This means that all innovation activities, as well as the policies supporting them, must be able to balance the contradictory purposes of proximity and distance. (Harmaakorpi et al. 2006.) There is a tension between similarity and difference, when too much or too little similarity of difference is problematic (Parjanen and Melkas 2008). The view of seeing distances as innovation potential offers an opportunity to regard the distances and possible collisions between niches and the regime as potential for change. However, because too much distance may be problematic, the brokerage function is essential to interpret the different views and reduce the distances. Brokerage intervention means, for instance, advising on the advantages of co-

operation, giving information, identifying opportunities, catalysing discussions between different actors, or bringing companies together. (Parjanen et al. 2010.)

It should be noted that the concept of innovation itself has also been criticised, for instance on the basis of who defines the value for innovation. Many inventions that are regarded as innovations are not unanimously beneficial, they have multiplex and ambiguous impacts, an automobile as an example (see e.g. Pol and Ville 2008). This pertains to the topic of this dissertation, innovations of ageing, in a decisive way, because there are various interests and ethical issues fundamentally included in the field of ageing (see e.g. Leikas 2009; Topo (ed.) 2006; Topo 2007; 2009), no matter what type of innovation is in question.

4 PERSPECTIVES OF AGEING: WIDENING THE PERCEPTIONS

Different disciplines may provide different answers as to what is meant by ageing. (see e.g. Närvänen 2004.) Ageing can be studied at least from the perspectives of chronological, biological/physiological, psychological and social ageing. The social definition of old age, which is central in this study, deals with age as societal border, a classification and distinction (Jyrkämä et al. 2009); for example, who is old and what factors affect the definition of old age. (Tikka 1994, 89). Social ageing deals with the relationship between a person and the environment. Social age is socially constructed, and refers to age norms and to appropriate attitudes and behaviour connected to a certain age, subjective perspectives and ascribed age (Ginn and Arber 1995, 7; Jyrkämä 2001, 274)

According to the theories and perspectives of ageing, getting old is a two-sided phenomenon: it brings many losses (for example, decline of functional ability), but it has also been described as a time of harmony, freedom and resources (Koskinen 2004) Also social gerontology has adopted two principal approaches toward the study of later life. The first is the functionalist perspective associated with “Chicago School” and disengagement theory; the second is centred round the concept of “third age” and is associated particularly with the work of British social philosopher and historian, Peter Laslett (Gilleard and Higgs 2002).

Disengagement theory, later to be much criticised and also misinterpreted (see e.g. Rose 2000) emphasises adaptive behaviour to ageing. According to Elaine Cumming, and William Henry, developers of the theory, “aging is an inevitable, mutual withdrawal or disengagement, resulting in decreased interaction between the aging person and others in the social system he belongs to.” (Cumming and Henry 1961, 2). According to this theory, later life is defined by disinvestment from social action and active roles in society. This disinvestment is mutually negotiated by both the individual and society, and is considered normal and appropriate. (Gilleard and Higgs 2002, 369-370; Ebersole et al. 2005). The disengagement theory is based on the view that old age means preparing for death and is labelled by decreased autonomy, powerlessness, dependency and being under guardianship (Rintala 1999). The disengagement theory postulates that society withdraws from the elderly to the same extent as the elderly withdraw from society. (Cumming 2000). Since death must soon come to the elderly, both society and the elderly prepare for it sociologically and

psychologically (Rose 2000, 41). Disengagement frees the old to die without disrupting vital affairs (Cumming 2000).

The activity theory of ageing was developed by Havighurst (1963) and is based on the belief that keeping as active as possible is the ideal for later life (Ebesole et al. 2005), and idleness hastens illness and decline (Havighurst and Albrecht 1953, Katz 2000). Activity theory assumes that morale and life satisfaction are positively related to social integration and high involvement with social networks. Role losses, like widowhood and retirement need to be compensated by these compensatory activities. (Victor 2005, 24.) According to the activity theory, successful ageing is reached by active participation in society and being independent. (Rintala 1999, 95). This theory has also been criticised as “championing retirement life as busy, creative, healthy and mobile”. (Katz 2000, 138), and making idleness in retirement condemnable. According to Katz, non-working populations, like the retirees, have become targets of state policies to “empower” and “activate” them (Katz 2000, 147).

According to the continuity theory, successful ageing is achieved by maintaining the previous lifestyle. The question is not about disengaging or activating, but about being autonomous and making rational choices (Rintala 1999, 95). The continuity theory, built upon the activity theory, is based on the idea that the personality, attitudes, values and basic patterns of behaviour remain constant throughout the life span. The continuity theory holds that the individual will attempt to maintain stability in the lifestyle he or she has developed over the years. In making adaptive choices, older adults attempt to preserve and maintain existing internal and external structures. They prefer to accomplish this objective by using familiar strategies tied to their past. Continuity is not the opposite of change, but change is linked to the person's perceived past. Continuity can be either internal or external; the inner psychological characteristics as well as social environment and role relationships. Continuity is thus a grand adaptive strategy that is promoted by both individual preference and social approval. (Atchley 2000.)

Positive perspectives towards ageing have emerged, for example, around the concepts of ‘the third age’, ‘active ageing’, ‘the third age’ and ‘productive ageing’. The concept active ageing was adopted by the World Health Organisation in the late 1990s, and refers to continuing participation in social, economic, cultural, spiritual and civic affairs (Avramov and Maskova 2003, 26). Likewise, the discussion of the third age (Laslett 1989; Gilleard and Higgs 2002), works as an alternative view to the interpretation of an ageing population being a burden (Karisto 2007, 103). In this concept, the focus is on healthy, autonomous and active ageing; it is seen as a time of personal achievement and fulfilment (Laslett 1989) without the responsibilities of work or caring for small children. (Karisto 2002; Muhonen and Ojala 2004). By offering the opportunity to develop a distinct and personally fulfilling lifestyle in retirement, third age is a counter discussion to the functionalist perspective of the disengagement, activity and continuity theories, which, in turn, are concerned with how the elderly adjust to changes and losses in social roles (Gilleard and Higgs 2002; Victor 2005).

The third age, between the active working age and “the real” late old age, has also a cultural dimension that suggests that people reach retirement age with different expectations and orientations than before (Karisto 2007, 104). As a demographic phenomenon, third age is already here, but as a cultural phenomenon with the changes of ‘landscape’ in consumption and free-time, it is just emerging (Karisto 2002, 140; Jyrkämä et al. 2009, 150). People

reaching retirement age do not immediately adopt the role of the elderly, but new expectations, new senior life, lifestyles and practices are directed towards retirement (Karisto and Konttinen 2004). Third age is a vision framed by choices and consumption opportunities (Karisto 2007,103; Laslett 1989). Increases in income, wealth, consumption and leisure constitute core elements of the post-war changes that affected the emergence of the third age as a generational phenomenon. (Gilleard and Higgs 2002). The third age is seen to be a more dynamic and action-oriented view on old age (e.g. Bury 1995; Vaarama 2009) than the preceding functionalist-labelled theories.

Close to the ideologies of active ageing and third age is also the term productive ageing (e.g. Morrow-Howell et al. 2001). Advocates of productive ageing argue that society simply cannot afford to overlook the potential of the older population to serve as a resource for social change and economic growth (Morrow-Howell et al. 2001, 4). The concept of productive ageing generally means the participation of the elderly in paid work, voluntary activities and care of their close ones. Leinonen (2007) understands productive participation as concrete activities in which the aim is also to produce goods or activities that serve other people. Such participation is active and implies directly affecting societal issues and issues that are important to the person in question, but participation may be realised also as *a feeling* of being involved. Emphasis on productivity is a protest against referring to the elderly as a homogenous group: as frail targets dependent on other people. (Leinonen 2007.)

However, the concept of the third age is also criticised for the same reasons as the activity theory: it is said to set a norm of social and active life-style being the correct way of growing old (Bury 1995). A strict line is drawn between the third and fourth ages, thus accentuating the negative stereotypes connected to old age. (Jyrkämä 2001, 310; Karisto 2002, 139). The 'fourth age' is a concept that has been used to describe the image of old age, characterised by frailty, dependency and decreased autonomy. The opposite of the active view of ageing, old age here often relates to deprivation of financial and material resources, of social interaction and participation in society. The new concept of 'fifth age' again implies threats according to the ordinary view; an increasing need for services and increasing costs in institutionalised living (see Vaarama 2009). Old age as a challenge implies as a whole that new products and operating models are needed so that scarce financial resources are able to respond to the needs of a growing group of older people.

Instead of being stable, images and theories of old age are constructed in various interaction situations. For example, the dependency in old age is not an automatic corollary of biological ageing and decline, but is in large part a consequence of social conditions, either learned or self-selected (Baltes and Cartensen 1999, 213-214). Creating and applying the old age theories also plays a part in constructing the images of ageing.

Jyrkämä (2001) further suggests attention be paid to a more dynamic view of social ageing, where older people are seen as actors and agents making choices. From the point of view of agency, it is essential to see people as active, more or less goal-oriented actors, who have knowledge about their actions and of the consequences of the actions, and who are able to explain and give meanings to their action. (Jyrkämä 2001, 301). However, visible activity is not necessarily related to agency. Also the disengagement from certain areas of society can be a result of a considered action and selectivity. According to socio-emotional selectivity theory, reduction of social contacts in old age reflects an active selection process in which

emotionally close social relationships are maintained and more peripheral social relationships are discarded (Baltes and Cartensen 1999, 215).

5 MULTI-LEVEL PERSPECTIVE ON TRANSITION AND SYSTEM INNOVATION

Ageing of the population as a megatrend, changes in the service production in the social and health care sector, as well as technological development, are macro-level changes that are contributing the societal change related to ageing. The changing and broadening perceptions of ageing and innovation as models of thinking are also contributing to the change as lower level factors. Next, I will present the multi-level perspective on transition as a framework of this study to describe how the transition takes place in interactions between different levels.

Work on transition and system changes has been expanded under different terms (Geels and Schot 2007), for example, regime transformation (Van der Poel 2003), technological revolutions (Perez 2004), technological transitions (Geels 2002), system innovation (Freeman and Perez 1988) and transition management (Rotmans et al. 2001, Loorbach 2007). To understand macro changes of the economy, Freeman and Perez (1988) talk about techno-economic paradigms to indicate periods in which particular technologies, methods of production and economic structures reinforce and co-evolve with one another, and they aim to understand the changes from one techno-economic paradigm to another (see also Geels 2004b). Changes of techno-economic paradigm are studied in these long-wave theories: they are far-reaching and affect the entire economy. The emergence of new technologies means that they may not fit into the institutional and social network and there will be a degree of mismatch between them. For Freeman and Perez, the techno-economic forces act initially and the socio-institutional framework eventually reacts. However, as Geels (2004b) notes, in such causality there is a danger of technological determinism, and Freeman and Louçã (2001) further refined the long wave theory by presenting five equally important subsystems in society: science, technology, economy, politics and culture. They have relative autonomy, for instance, there are subsystem cycles with their own fluctuations. However, they also interact with each other, and the fluctuations are dampened and coordinated by the links with other subsystems. At times, however there will be tension and a lack of synchronisation between subsystems, and this may cause economic crises, but may be overcome through innovations and gradual realignment. (Geels 2004b.) It is essential to study the relatively independent development of the subsystems as well as their interdependencies. (Freeman and Louçã 2001, 127)

A lower level of change in Freeman and Perez' innovation typology ² is the change in technological systems. These are far-reaching, affecting several branches of the economy. (Freeman and Perez 1988; Geels 2006). System innovations differ from changes in the techno-economic paradigm, because changes in this paradigm refer to pervasive technologies

² Freeman and Perez (1988) distinguish four types of innovations: incremental innovation, radical innovation, changes in technology system and changes in the techno-economic paradigm.

on the level of entire societies, while system innovations occur on the level of societal functions, like health care (Geels 2005, 5).

5.1 Description of the multi-level perspective as a modeller of transition

Leaning on Freeman and Perez' technology systems, much of the recent work is done by Frank Geels and his colleagues (e.g. Geels 2002; 2004a; 2004b; 2005; 2006; Geels and Schot 2007; Geels and Kemp 2007), broadening the conceptualisation of the technology system to socio-technical systems, where technology is seen as heterogeneous, and the functioning of technologies involves links between heterogeneous elements. (Geels 2006). The transition from one system to another is caused the co-evolutionary dynamics within and between three levels, and this is why Geels calls it "multi-level perspective on transitions."

The value of this approach is to contribute the seldom addressed field of transitions a shift of some socio-technical system from one regime to a new regime. (see Geels 2006). Long-wave theories like that of Freeman and Perez have focused on studying changes in the techno-economic paradigm, while there are many studies about innovation systems, processes and diffusion. The technological systems approach and Large Technical Systems approach say more about functioning and emergence of these systems than their change (Geels 2006, 1000). The model also helps understand why neither the external pressures nor radical new ideas alone do not generate the system change, and why change requires decisions by many actors and interaction (Kivisaari and Saranummi 2008).

To understand transitions, the insights of change as co-evolutionary dynamic processes between heterogeneous elements, are combined in a multi-level perspective, comprising three levels: macro-level (landscape), meso-level (regime) and micro-level (niches), see Figure 1.

Increasing structuration
of activities in local practices

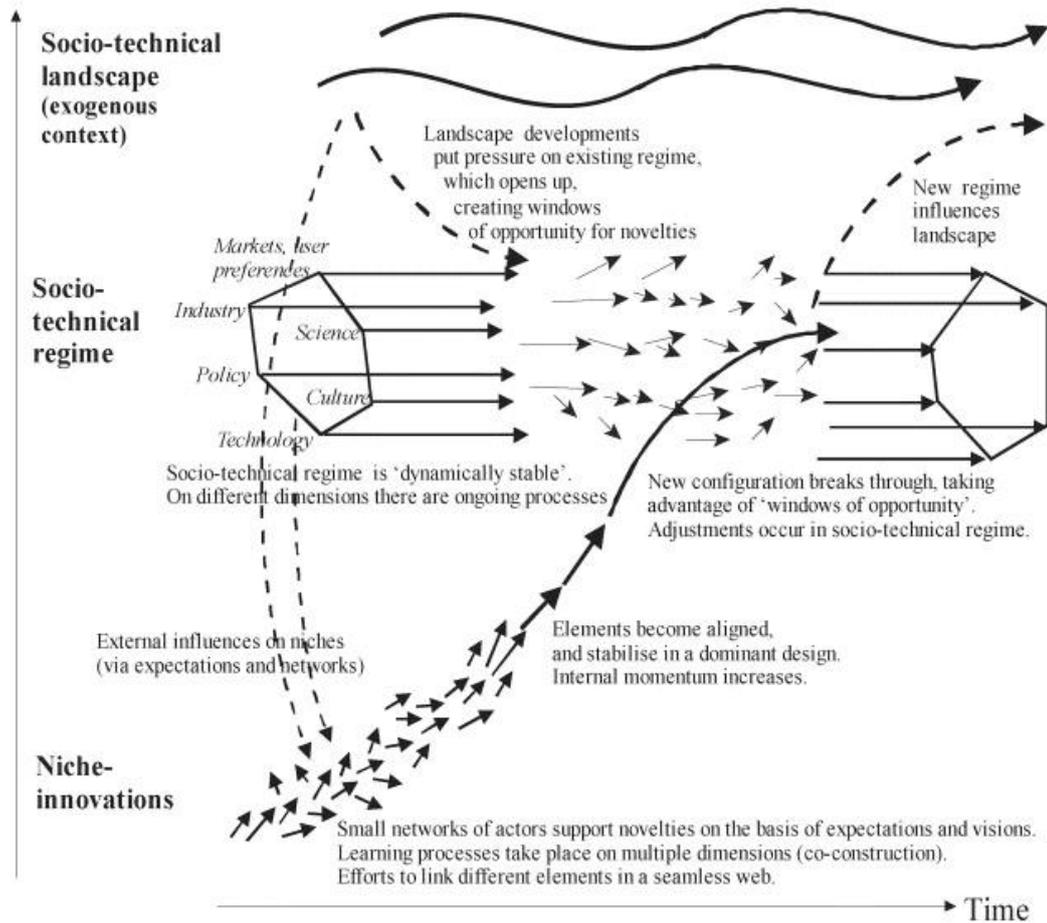


Figure 1. Multi-level perspective on transition (Geels and Schot 2007, 401).

As mentioned, the multi-level perspective distinguishes three concept levels; technological niches, socio-technical regime and the socio-technical landscape. *The socio-technical regime* forms the meso-level of the multi-level perspective, and refers to the rule-systems that guide and orient activities of social groups, including scientists, users, policy makers and societal groups, that interact and form networks with mutual dependencies. (Kemp et al. 1998; Geels 2005; Geels and Kemp 2007, 442). It includes the markets, user preferences, scientific understanding as well as political and cultural atmosphere, besides technology and infrastructure. The socio-technical regimes are dynamically stable, which means that there

are ongoing processes within the regime, but these aim at keeping the regime stable. (Geels 2004a.)

Regimes as rule systems are related to the societal perceptions and the way of thinking. Applied in the context of ageing, the regime of ageing consists of the preferences by older people related to the products and services they use and consume, and the response of the market and the public sector to those wishes and requirements. It also consists of the industry, infrastructures and service structures producing those products and services, as well as the products (of both high and low technology) and services themselves. Scientific understanding and paradigms, for example, the perceptions of innovation, reflect on how those products and services are produced. Likewise, understanding of what ageing is all about, for instance, as a biological and social phenomenon, is also part of the regime as a rule system. Also cultural values and beliefs are part of the regime as a rule system, as well as policy goals, regulations and laws (see Geels 2005, 16). The stability of the regime is maintained by interactions and alignment between these systems.

The stability of existing socio-technical systems occurs through interaction between the material aspects of the system, embedded actors and organisational networks, and the rules and regimes that guide perceptions and actions. The path dependence, which locks in existing socio-technical systems, is described as occurring at the meso-level of analysis. Here there is a patchwork of regimes that make up the 'deep structure' of socio-technical systems, only one of which is the technological/product regime. The others are the science regime, policy regime, socio-cultural regime, and the users, markets and distribution networks regime (Genus and Coles 2007.) These regimes represent different social groups that share various rules. *Regulative rules* are characteristically found in legislation, regulations and standards. Examples of *normative rules* are role relationships, values and behavioural norms. *Cognitive rules*, again, refer to the belief systems, innovation agendas, problem definitions and guiding principles. (Geels and Schot 2007.) Companies (and other organisations) react to problems posed by existing technology based on the engineering insights and managerial lessons. Products are embedded in consumption patterns, through routines and cultural meanings. The rules may constitute a sense of identity for companies and the persons in it. Consumers have developed certain ways of life, routines and understandings that may be viewed as rules too. The rules do not exist individually, but are linked together in semi-coherent sets of rules, called regimes. (Geels and Kemp 2007, 442-443.)

The different regimes have internal dynamics, which generate fluctuations and variations (e.g. political cycles, technological trajectories, cultural movements and hypes), which are usually dampened by the links with other regimes, thus providing coordination. As long as socio-technical regimes are stable and aligned, radical novelties have few chances and remain stuck in particular niches. However, if tensions and mismatches occur in certain rules (for example, if changes in cultural values and user preferences are not noted by markets), this creates interpretative flexibility for actors, and 'windows of opportunity' for the breakthrough of radical novelties.

The socio-technical landscape forms an exogenous environment including, for example, macro-economics, deep cultural patterns and macro-political developments. Changes at the landscape level usually take place slowly (Geels and Schot 2007), but changes in the landscape may exert pressure on the regime, and make the rule systems unstable, and these

ongoing processes at the levels of regime and landscape may create a window of opportunity for the niche novelties (Geels 2004a).

The micro-level of Geels' model is formed by niches where radical novelties emerge. Experimental niche-innovations are carried and developed by small networks of dedicated actors, and have no connections to stable rules, often outside or on the fringe of the existing regime. (Geels and Schot 2007; Geels and Kemp 2007). These radical innovations are born either in response to landscape changes or in a bottom-up fashion. Niches can act as spaces for experimentation protected from market selection pressures, or to enable social networks supporting radical innovations to be built up. Niches may influence conventional regimes in a number of potential ways: by demonstrating alternative ways of providing goods and services, by creating powerful and resourced new actor networks, by generating shared expectations about the promise of a new technology and by producing competitive models of alternative regimes. (Berkhout et al. 2008.) Kemp et al. (2001) consider that such niches may be strategically managed in the sense that they can be used to nurture fledgling technologies that may offer substantial environmental benefits in future at a time when the future is most uncertain. These niches can then provide opportunities for society to learn about the functionality of alternative designs, user preferences, appropriate public policies and so on. (see Genus and Coles 2008.)

The new technologies may remain stuck in these niches for a long time, if they face a mismatch between the existing regime and the landscape. Until external circumstances are right, for example, the regime is destabilised creating a window for opportunity for these radical novelties. This is why the niche innovations are called "seeds for change". (Geels 2005.) A wider breakthrough is followed by a stabilisation and new types of structuring. These dynamics and interplay at different levels reinforce each other and lead to system changes and transitions. (Geels and Kemp 2007).

Early strategic niche management literature (e.g. Weber et al. 1999; see Schot and Geels 2008) suggests that regime shifts would come about through bottom-up processes of niche expansion. However, Berkhout et al. (2004) pay critical attention to the emphasis on the role of niches as a principal driver for regime change, and argue that there is a range of different 'transition contexts' in which regime change can take place. Schot and Geels (2008) argue for the importance of the niche innovations, but alignments of processes at many levels are emphasised: niches can only diffuse more widely if they link up with ongoing processes at regime and landscape levels (Schot and Geels 2008, 547).

Tensions and misalignment may result, for instance, from changes on the landscape level, internal technical problems, negative externalities and effects on other systems and regimes, changing user preferences, strategic games between economic actors. If tensions exist, a radical innovation may take advantage and break through in mass markets. It then enters competitions with the existing system, and may eventually replace it. This will be accompanied by wider changes and restructuring in policies, infrastructures and user practices. Eventually a new system or regime is formed, carried by a network of social groups which create and maintain socio-technological systems. Then the new regime may eventually also influence wider landscape developments. (Geels 2004b, 914-915).

The multi-level perspective argues that transitions come about through interactions between processes at these three levels: niche-innovations build up internal momentum, changes at the landscape level exert pressure on the regime, and destabilisation of the regime creates windows of opportunity for niche-innovations. The alignment of these enables the breakthrough of novelties to mainstream markets where they compete with the existing regime. (Geels and Schot 2007). Besides the niche-level novelties, the ongoing processes in the socio-technical regimes, for example, emergence of new markets, policy dynamics and new technologies can act as stepping-stones (Geels 2005, 86). Regimes should be analysed not only as barriers but also as opportunities.

Geels and Kemp (2007) distinguish three types of change: reproduction, transformation and transition. *Reproduction* means the dynamics at the regime level, where existing rules are reproduced by the actors and the element of socio-technical system is defined. In *transformation*, there are instead interacting dynamics at the regime and landscape level. The basic mechanism is that changes at the landscape level exert pressure on the regime, leading to the re-orientation of the direction of innovative activities. This happens through a change in the regime rules that coordinate actions of regime actors, for example, changes in the technical problem agendas, visions, goals and guiding principles, relative costs and incentive structures, regulations and perceptions of opportunity. Transformation means the mechanical adjustment to landscape pressures but it happens through negotiations, power struggles and shifting coalitions of actors. In *transition*, there are interactions between dynamics at landscape, regime and niche levels. A transition refers to a shift of some socio-technical system from one regime to a new regime. It is not about the re-orientation of an existing trajectory, but about a shift to a new trajectory (for example, a transition from a transport system based on horse-drawn carriages to a transport system based on automobiles). Transition involves changes in the socio-technical system (technologies, knowledge-base, infrastructure, regulations, user practices, cultural preferences) social groups and regime rules. (Geels and Kemp 2007, 445-446.)

Transitions can also be called *system innovations*, because they involve changes on many levels, and they see innovations as intertwined to economy and technology. This is the widest definition of system innovation, while the other definitions are related to relationships to other innovations and to systemic innovation processes (Valovirta and Pelkonen 2010, see also Chapter 3.1 in this study.) System innovations at societal level mean a long-term structural change within society (van der Bosch et al. 2005). System innovations are embedded in certain institutions, structures and values. The change is not a matter of solving an isolated problem but of overhauling the entire system at different levels. They are comprehensive long-term innovations, and require the efforts of many stakeholders, and a change of perspective and cultural shift among these stakeholders. (Bruijn et al. 2004, 3.) They involve changes on the technical and the user sides (van der Bosch et al. 2005).

The interplay between processes at different levels takes place in different phases: when the innovation conquers wide market shares and links up with ongoing processes in the regime. This is accompanied by wider adjustments in the socio-technical regime. (Geels and Kemp 2007; Geels 2005, 88). However, transitions do not come about easily, like the change in the techno-economic paradigm always meets with inertia in a socio-institutional adaptation (Perez 2004; Harmaakorpi 2004; Pihkala et al. 2007). A period of transition is characterised by a deep structural change in the economy and such changes require an equally profound

transformation of the institutional and social framework. The existing institutions take a long time to grasp the all-pervasiveness of the transformation in ever more parts of the economic system. Traditions, established routines and past successes with the usual practices make it difficult to capture the meaning and the threat of these successive changes as a source of institutional mismatches and problems. Even those who realise the importance of the technological and economic changes do not often connect with the necessary adaptations of their own sphere of influence or with a need for changes in their own behaviour. Even when the need for change is understood, social institutions and the general framework of socio-economic regulation have a natural inertia. So, during paradigm transitions, there are very intense transformations in technology and the economy and a high level of inertia and confusion in the socio-institutional sphere. (Perez 2004.) Likewise, existing regimes are characterised by lock-in and path dependence, and oriented toward incremental innovation along predictable trajectories. The ongoing processes on different dimensions of the regime aim at keeping the regime stable, which is maintained as long as the activities of social groups and incremental changes are aligned and go 'in the same direction'. (Geels 2004a, 86.)

The multi-level perspective can be seen as a conceptual combination of two explanations, external circumstances and internal drivers. External circumstances refer, for example, to the changes in the 'landscape' level, or changes in the user preferences exerting pressure on the regime. (Geels 2004a, 37-38.) System innovations are born in the process of 'circular causality' (Geels 2005, 88). This means there is no single cause or driver of system innovation, but simultaneous processes at many dimensions and levels. Innovations cannot be caused by novelties alone at the niche level, because their breakthrough and diffusion depends on processes and circumstances at the regime and landscape levels. When the socio-technical regime is stable, radical novelties usually have little change. But even where there are tensions in the regime, there is no guarantee that novelties will break through, because problems may be solved with incremental innovations within the regime. (Geels 2005, 88-89.)

Changes in regime mean a change of rules, because regimes are defined as a web of rules. Geels and Schot (2007) present two endogenous rule changes that are simultaneously present in organisational fields 1) evolutionary economic, where rules change indirectly through market selection, and 2) socio-institutional, where actors negotiate about rules in communities. In this socio-cognitive institutionalisation actors directly negotiate about rules (belief systems, interpretations, guiding principles, regulations, roles), for example, in journals and conferences.

In Geels' model, "*human action is structured, but leaves room for intelligent perception and strategic action*" (Geels 2004b, 915). The basic ontology behind the multi-level perspective stems from the sociology of technology, where three inter-related dimensions are important; 1) socio-technical systems, the tangible elements needed to fulfil societal functions 2) social groups who maintain and refine the elements of socio-technical systems and 3) rules (understood as socio-technical regimes) that guide and orient the activities of social groups. (Geels and Kemp 2007.) These elements all influence each other, and co-structure each other. Actors of social groups do not act autonomously, but in the context of social structures and regulative, normative and cognitive rules. In the rule based-model of action, there is rule-using, rule creating and rule-alteration by actors, and this agency-structure –dynamic leaves room for different actions, rational, interpretive, power based and routine actions. (Geels and Schot 2007.)

5.2 *Managing the transition*

There are varying views in the literature about possibility managing the change. Smith et al. (2005) and Smith and Stirling (2010) are interested in purposeful transitions, intended and coordinated changes that emerge from outside the existing regime, and governance of them, while Geels and Schot (2007) argue that no transition can be planned and coordinated from the “outset”, but every transition becomes coordinated at some point through the alignment of activities of different groups. But, despite the local attempts to change the direction in a certain way, for example, creating and societal embedding of niches, as noted by Geels, the transition cannot be completely controlled, because of its systemic and co-evolutionary nature. As each transition is unique, there is no set of general rules, but historical studies suggest that technological regime shifts usually include the interrelations between the technological and social environment, as well as specialised applications of radically new technology (niches). (Kemp et al. 1998). It should be noted that changes at the regime level may also influence the landscape-level, for instance, the structures and support mechanisms in society may influence the birth rate.

Several approaches, however, have been suggested directing and orienting the technical change into social goals, for example strategic niche management approach (Kemp et al. 1998), transition management approach (Rotmans et al. 2001, Loorbach 2007), and the approach of societal embedding of innovations (Saari and Kivisaari 2009; Heiskanen et al. 2009). The diffusion and breakthrough of radical innovations could occur as the outcome of links between different levels. “Niches are locations where it is possible to deviate from the rules in the existing regime.” (Geels 2004b, 912). The strategic niche management approach (Schot et al. 2004; Kemp et al. 1998) was developed to facilitate the development and management of niches for promising technologies, to expedite a transition into a new regime. It means the creation of protected spaces for the development and use of promising technologies by means of experimentation. It brings the expertise of users and other actors into the technology development and generates interactive learning and institutional adaptation (Kemp et al. 1998, 186). Strategic niche management is based on the quasi-evolutionary perspective, developed by Rip (1992, 1995) and Schot (1992, 1998), with the idea that a technological niche forms a protected space in which these inventions can be tried out and further developed until they can compete and survive in mainstream markets.

Transition management refers to an attempt to redirect the existing dynamics of technological change towards societal goals (Heiskanen et al. 2009). However, the transition objective is multi-dimensional, comprising a multitude of policy and sector aims, and “does not have to be set in stone” (Rotmans et al. 2001, 8) Transition management is built around the thinking that “societal change is too complex to handle in terms of management but it is possible to create relative simple rules on how to influence societal change.” (Loorbach 2007, 86.) Principles and steps are defined, for example, by Loorbach (2007) and Rotmans and Loorbach (2009), in which they pay attention to niche development by creating spaces for frontrunners, forming new coalitions around these arenas, driving the activities in a shared and desired direction, and developing coalitions and networks into a movement that puts societal

pressures on regular policy (Loorbach 2007, Rotmans and Loorbach 2009). Transition management means long-term policy design with both top-down and bottom-up processes and a particular feature is the interconnectedness of technological and social systems, including governance models and institutions. Transition management aims at designing policies for long-term sustainability through system innovation, that is, the transformation of all sectors. Transition management can, for instance, serve as a way for niche-actors to link their innovations to the broader health care policy. (Heiskanen et al. 2009).

Close to the approaches of strategic niche management and transition management is the societal embedding approach (Saari and Kivisaari 2009), aiming at mutual adjustment of the innovation and its environment; widening the scale of innovation from local experiments to a national level system innovation with strengthening the dialogue between users, providers, developers and societal actors with a researcher-developer as a facilitator.

5.3 Assessment of the multi-level perspective

Geels' multi-level perspective has been discussed and criticised for example by Genus and Coles (2007; 2008), Smith et al. (2005) and Smith and Stirling (2008), for instance, as being functionalist, determinist and evolutionist because of characteristics of transition linearity and paying relatively little attention to the agency in socio-technical transitions. There are slight differences between the views of Geels in contrast to Smith and Stirling, who are interested in governance and purposive transitions, while Geels accentuates the dynamic interactions between processes, and argues that no transition can be planned and coordinated from the outset. Geels sees that every transition becomes coordinated at some point through the alignment of visions and activities of different groups. This convergence is an achievement that emerges during transitions. (Geels and Schot 2007)

In response to the criticism, in his latest writings (Geels 2010) Geels has tried to pay more attention to the agency aspect discussing the multi-level perspective as crossover between evolution theory and interpretism. Both assume creative and heterogenous actors, but also acknowledge the embeddedness of actors in regimes. The crossover allows the multi-level perspective to combine the evolutionary interest in long-term patterns (trajectories, specialisation, invasion, extinction) with an interpretive interest in social enactment, sense-making and cognitive learning. Geels argues that between the levels, there is evolutionary logic, meaning that niche-innovations providing radical variety interact with broader selection environments at regime and landscape levels. However, the fit between variations and selection environments is also seen as an enacted and multi-dimensional process that not only involves markets but also social, political and cultural dimensions. (Geels 2010.)

Other fields of criticism concern the relative lack of clarity of the model, related to a lack of systematic analysis and a definition of the socio-technical regimes, niches and the transitions, for example, when does a transition start or end? It is not easy to disentangle whether a radical transition rather than ongoing system renewal is taking place. (Genus and Coles 2008). The paucity of empirical studies is also criticised, as well as using historical data without

acknowledging the debates surrounding the presentation, emphasising the technological focus despite the co-evolution of technology and society, and neglecting the transitions with important societal aspects. (Genus and Coles 2008).

When applying Geels' model, the weaknesses pertaining to the relative in clarity of the model are seen, for example, as a challenge to distinguish which phenomena belong to which level. To give an example: Is the productivity demand in services for the elderly a landscape level or a regime level factor? However, despite certain problems and these criticisms, the model is a very useful attempt to give a form to the rather chaotic processes of change, and the elements of which they consist. Therefore, it offers a useful model when applied to empirical case studies, in order to give form to the mechanisms in ongoing changes in the field of ageing, which so far have been lacking systematic analysis.

6 CONDUCTING THE RESEARCH

6.1 Research problem and research questions

What makes change so difficult? Why are even clear landscape-level changes not embodied in the structures of society and local practices? Why are innovative and radical local practices not easily embedded and diffused? The research problem in this study is to understand the change in the field of ageing, being a complex, multi-level and interrelated socio-technical system and influencing all fields of society. The societal transition does not account for the things inside the regime alone, or for the changes in the landscape, as well as the radical innovations, but in the interplay between all these levels. The question is about co-effective elements consisting of macro-level landscape changes, existing socio-technical practices and structures and bottom-up niche-innovations. The central focus of this study is on analysing the mechanisms of this dynamic. The phenomenon of ageing being a wide societal phenomenon is a very accurate and interesting application area to study this dynamic. Based on this, the main research question of this study can be formulated:

What are the mechanisms in the dynamics between landscape changes, socio-technical environment and bottom-up niches in the field of ageing, and how can they be governed?

This is studied through the following sub questions:

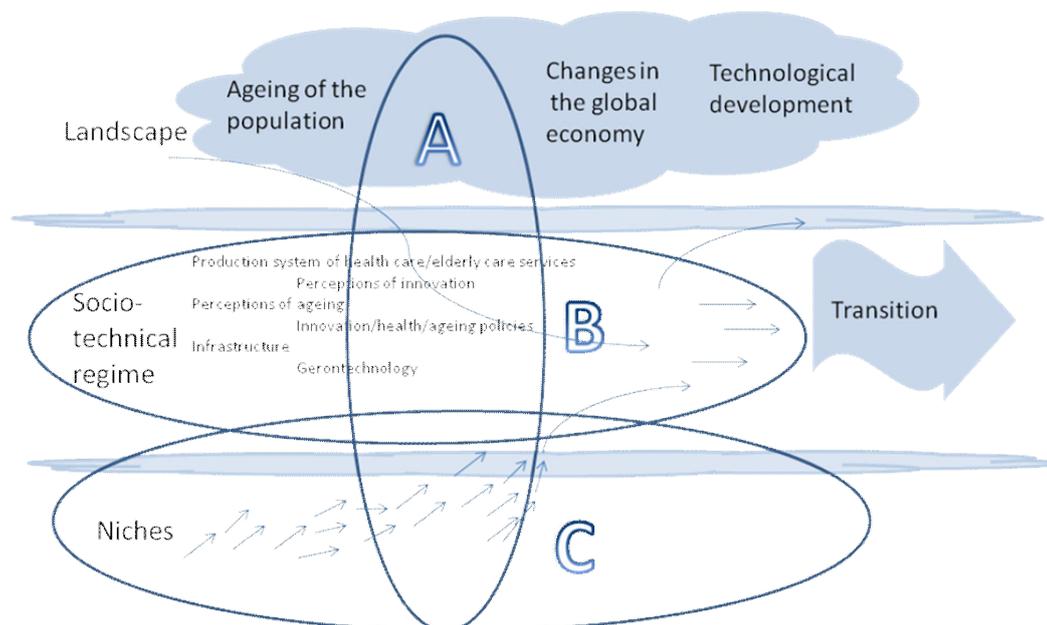
1. What is the dynamic between landscape-level, socio-institutional regimes and niche-level innovations and how to use the dynamic as a potential for change? (studied in Articles 1-2)
2. What is the internal dynamic of the socio-technical regime? In what ways is the technology intertwined in its contexts and what are the implications of this interrelation? (studied in Articles 3-4)
3. How to utilise the potential of niches as "seeds of change" by building multi-actor innovation networks of ageing? (studied in Article 5)

The framework of the study is the multi-level perspective of transition by Frank Geels (see Figure 1 in Chapter 5) including landscape-level changes, the socio-technical regime and niche-level innovations, which are mutually interrelated. In the study, the essential starting point is the structuration dynamics in the process of change. This offers an actor-oriented view, but does not just analyse the relations between the actors, but also analyses the way the rules and structures frame the action while the actors are creating, using and acting against the rules. Special attention is paid to analysing how the perceptions of ageing affect the institutional structures and innovation activities as part of the socio-technical system, and how the perceptions of ageing are produced through action and interaction.

The study consists of five original research articles that have their separate research questions, focuses and methodological views. Some articles also deal with issues other than ageing – for instance, Articles 1-2 only indirectly concern the question of ageing as paradigm and landscape changes and their influence on cognitive and socio-institutional structures. The articles also represent different aspects of ageing: for example, Article 2 is about the innovation activity of ageing mostly from the perspective of threat (affects of increased service needs on the ways of organising public services), meanwhile Article 5 represents the perspective of the elderly as a resource: as business opportunities for private markets.

6.2 Research setting: Original publications at the nutshell, positioned to the multi-level perspective of transition

Figure 2 shows the positioning of the original articles in the framework of multi-level perspective on transition. The five original articles in this dissertation have been divided into three overlapping themes describing different aspects of the multi-level perspective.



- A (Articles 1 and 2) = Dynamics between levels: overcoming the crashes
- B (Articles 3 and 4) = Inner dynamics of the regime: socio-technological relationships
- C (Article 5) = Distance management: Building multi-actor networks of ageing

Figure 2. Positioning the articles in the multi-level perspective of transition (adapted from Geels 2002).

The following presents the articles divided by themes:

A Dynamics between levels: overcoming the collisions

This section handles the changes in the techno-economic paradigm and the landscape, and the ability of the regions and public sector organisations to react to the changes. The focus of this section is on the dynamics between landscape, regime and niche-levels during change. The role of dynamic capabilities in the regional context in the change of the techno-economic paradigm can be considered an attempt to manage the dynamics between landscape and socio-technical regime, and the role of innovative practices to manage the collisions in experimental niches in the social and health care sector regime change.

Article 1: Pihkala, T., Harmaakorpi, V. and Pekkarinen, S. (2007). Dynamic capabilities and social capital in breaking socio-institutional inertia in regional development. *International Journal of Urban and Regional Research*. Vol 31:4, pp. 836-852.

Basic idea: This article deals with the change in the techno-economic paradigm and the ability of the regions to respond to the change. A shift in the techno-economic paradigm will affect regions. Regions, however, are path-dependent units. This path-dependency often leads to considerable socio-institutional inertia during transformation whereby regions aim to remain competitive in the face of worldwide competition. The article assesses the role of the dynamic capabilities, the aim to reform regional resource configurations, and social capital in regional adaptation. The research setting is based on the bidirectional relationship between dynamic capabilities and resource configurations.

Background theories and central concepts: Dynamic capabilities, social capital, the change of the techno-economic paradigm

Data and analysis: survey, factor analysis

Central results: In the analysis, five factors influencing the regional development networks can be defined (1) bonding social capital; (2) creative social capital; (3) command and control society; (4) intra-regional bridging social capital; (5) inter-regional bridging social capital. The results of the survey reveal the respondents' fairly good awareness of the prevailing techno-economic paradigm and of the strong socio-institutional inertia confronting change in practice. The results suggest, however, that there are systematic differences in responsiveness between local politicians and other decision-makers. The study concludes with a discussion of the relevance of shared common views on the development needed within the region.

Article 2: Pekkarinen, S., Hennala, L., Harmaakorpi, V. and Tura, T. (forthcoming). Clashes as Potential for Innovation in Public Service Sector Reform. . Accepted to be published in *International Journal of Public Sector Management*.

Basic idea: The public service sector has faced a new situation along with the ageing of the population and productivity pressures. These "landscape" changes have pressured the public sector to create new operational and organisational models from private sector. The article deals with this change through the case of a municipal enterprise operating in the basic social and health care sector, a pilot model in Finland.

Background theories and central concepts: Multi-level perspective on transitions, niche innovation, change of the public sector

Data and analysis: Thematic interviews, content analysis

Central results: The examination shows that the diverse pressures also affect the niche level and appear as collisions between old and new, but these collisions can also act as a platform for innovations when opened up, analysed and facilitated. This clash of controversial expectations implies not only the need for new technological, service and organisational innovations in the public sector renewal, but also innovative practices that facilitate creating and embedding these innovations.

B Inner dynamics of the regime: socio-technological relationships.

In this section, the study focuses on a safety alarm system as a concrete example of a multi-faceted innovation being constructed in a nonlinear innovation process and defined through the usage. This section shows the dynamics of the technology being intertwined with its environment and being given meaning. The safety alarm system is not just seen as one kind of innovation, but a diversity of innovations the sides of which become visible dependent on the context and the perspective. The safety alarm system is studied as a socio-technical system encompassing production, diffusion and the use of technology, which are interrelated and mutually dependent in practice. This perspective emphasises that the social and technical aspects are strongly interlinked, and the functioning of technology is dependent upon its relationship to other elements. This section also deals with the potholes in the safety alarm system and the versatile innovation potential.

Article 3: Pekkarinen, S. (2005). Turvapuhelin vanhuutta rakentamassa. *Gerontologia Vol 19:3, pp.121-129. (In Finnish)*

Basic idea: This article aims to study how old age is produced and constructed in the speech of safety alarm systems. The starting point is the use of safety alarms as an “age act” and the speech of safety alarms as “age speech” producing and reflecting social perceptions of old age. The article studies how the elderly themselves justify the acquisition/non-acquisition of a safety alarm, and how they define its meaning and tasks in their lives. These justifications and tasks can be regarded as age acts reflecting on how the elderly refer to themselves as actors and choice-makers regarding the implementation and use of the safety alarm.

Background theories and central concepts: Third age and autonomy, fourth age and dependency, agency of the elderly, age acts, age speech

Data and analysis: Thematic interviews, content and discourse analysis

Central results: The study indicates that the use of the safety alarms appears in various age acts, portraying various images of old age. The age acts describing free will and autonomy were 1) the role of the safety alarm as activating and empowering, 2) commenting on the later life as obedience to the service system (seen as rule-breaking), 3) commenting on the later life as dependence (when struggling alone as long as possible without raising an alarm), 4) accentuating the elderly’s own responsibility for their health and life (the safety alarm system as an individual choice to manage the possible risks related to later life). The age acts describing the restricted choice of the users were 5) making the relatives feel safe 6) trust in the experts 7) indifference about the safety alarm as a part of life 8) obedience and not questioning the (sometimes impractical) rules; 9) accentuating the practicality and functionality instead of aesthetics and 10) being a user of safety alarm system as a sign of old age and to be avoided as long as possible.

Article 4: Pekkarinen S. and Melkas H. (2010). Safety alarm systems and related services: From potholes to innovation opportunities. *International Journal of Service Science, Management, Engineering, and Technology*. Vol 1:4, pp. 53-70.

Basic idea: This study focuses on an item of assistive technology targeted at the elderly; a safety alarm and the related service system. The research problem was to explore and identify innovation opportunities, with the help of “the pothole approach”. A safety alarm is not just a technical device; together with the related system, it can be seen as a holistic opportunity for various innovations. The operation of safety alarm systems and services depends on many critical points. Problems in safety alarm systems are identified in the study taking into account the technology, services and organisational network. The potholes are studied as sources and opportunities for potential future innovations.

Background theories and central concepts: Various perspectives on ageing, various types of innovation

Data and analysis: Thematic interviews and a survey; content analysis and quantitative study

Central results: The safety alarm system is a holistic innovation, where service and technology form an interlinked entity. Looking at it from different perspectives, various potholes can be found, but these can also be places for innovation. Looking at the phenomenon of ageing from different perspectives, innovations in exploiting the opportunities of ageing and innovations defeating the threats of ageing could be found. Service, social, organisational, process and marketing innovations, combined with technology, are significant parts of the innovation activity related to the ageing of the population.

C Distance management: Building multi-actor innovation networks of ageing

This part of the study explores building an innovation network of ageing through a concrete case. The case is the age business core process, which is part of the RPDM (Regional Development Platform Method) in the Lahti Region, Finland. Core process thinking is based on the strong industries in the region combined in a future megatrend like ageing. Traditionally ageing has mainly been related to the social and health sector, but the idea is that as a future megatrend it will involve all the sectors, which can be tackled through co-operation and combining expertise in different industries and sectors.

The central themes are resource configurations, non-linear innovation, interfaces between industries and sectors and differences between work cultures. There might be distances between the social and health sector and traditional manufacturing industries, but these distances are seen as potential for innovation, which can be utilized when the network participants are brought together and their work is facilitated by brokerage tools. The manufacturing industries can bring niche innovations to the social and health care sector “regime”, but the distances must be governed to get the breakthrough of these niches and to utilise the window of opportunity. This is why this section is called “distance management.” Distance management is close to the concepts of strategic niche management and transition management and acts as a tool in changing the regime.

Article 5: Pekkarinen, S. and Harmaakorpi, V. Building Regional Innovation Networks: Definition of Age Business Core Process in a Regional Innovation System. *Regional Studies*. Vol. 40:4, pp. 401 - 413, June 2006.

Basic idea: The focus of this article is on the definition of the age business innovation network as a core process of the Lahti (Finland) regional innovation system. Core process thinking is part of the Regional Development Platform Method and is presented as an innovative tool in developing regional innovation systems. Core processes are based on the potential development platforms identified in a region and aimed at exploiting the potential existing in the defined regional resource configurations. Core processes can also include some phenomenon or future megatrend possibly bringing business opportunities for the companies in the region.

The article offers a concrete case study example of giving a practical form to a network aiming at exploiting the regional resource configurations connected to the megatrend of the ageing of the population. The article has a practical description of the process consisting of the information gathering as well as arranging the workshop connecting the actors. The age business core process was based on the idea that the ageing of the population provides a new business potential for companies and new challenges for regions globally. The main object of the study was to see if the organisations in the wellbeing sector, on the one hand, and businesses in the traditional manufacturing industry, on the other, can co-operate in developing new wellbeing products and, finally, if the age business could reasonably be made a core process in the Lahti region.

Background theories and central concepts: Regional innovation systems, innovation networks, ageing as business opportunities

Data and analysis: interviews and surveys; qualitative content analysis, network analysis and quantitative study

Central results: The megatrend of ageing was well recognised by the interviewees. The ageing of the population as a phenomenon had been reflected in both the public social and health care sector and in the traditional manufacturing industries, and the idea of co-operating in the age business core process was favourably received by all parties. The respondents suggested that it would be particularly important to get the companies in the region interested by pointing out their opportunities for new business with the age business. It was considered important to encourage and maintain the co-operation between actors from different sectors to attract diversified expertise for this multidisciplinary concept. The role of collaboration is especially important in the age business, where there is a great range of actors, needs, interests and work cultures. Success is essentially based on collective learning and knowledge creation.

7 RESEARCH APPROACH: ONTOLOGICAL AND EPISTEMOLOGICAL REMARKS

This dissertation deals with societal change, which can be explained in many ways. Some of the explanations are based on agency (for instance the theory of rational choice) and some are more functional (for example, system theory and evolution theory). Debates surrounding agency and structure, and how these two concepts interrelate (the agent-structure problem), is one of the central issues of contemporary social sciences.

Maybe the most remarkable contributor to this issue is British sociologist Anthony Giddens, whose concept of structuration and dual nature of structures forms the social ontology of this study. The structuration theory takes a constructionist approach of society. Giddens' theory of structuration is challenging the functionalist and evolutionist view of social change, where the historical development is seen as a linear natural process where simple organisational forms are replaced by more complex ones. (Kaspersen 2000.) The historical-theoretical aspect of the structuration theory was mainly developed in Giddens 1981 (*The Contemporary Criticism of Historical Materialism*) and Giddens 1984 (*The Constitution of Society*). It is a theory about what society is, how it is reproduced and transformed. (Kaspersen 2000)

The concept of structuration means the duality of structure, that is, the mutual dependence of structure and agency. In this regard Giddens defines structures as consisting of rules and resources implicated in social reproduction. For Giddens, the rules are normative elements and codes of signification that constrain the actions, the authoritative and allocative resources make it possible. (Giddens 1984). Structure is thus both constraining and enabling. Actors interact with the constraints but also make structure possible by providing coordination and stability. By the dual nature of structure, Giddens means that "the structural properties of social systems are both the medium and the outcome of the practices that constitute those systems" (Giddens 1979, 69). It forms personality and society simultaneously: the same structural characteristics participate in the subject (the actor) as well as in the object (society). (Giddens 1979, 69-70.) Briefly, structure shapes people's practices, but at the same time these practices constitute and reproduce social systems. Structures consist of a totality of (social) rules and resources. Rules are connected to practices, because to know a rule, as Wittgenstein says, is to "know how to go on", to know how to play according to the rule. (Giddens 1979, 67.) According to Giddens, rules generate or are the medium of the production and reproduction of practices. (ibid.) The nature of resources is either authoritative or allocative: authoritative resources enable the mutual understanding and derive from the coordination of people. They also refer to the possibility of dominating and having power over other people or actors, while allocative resources stem from the aspects of the material world. (see Giddens 1984; Kaspersen, 2000, 68.)

In the context of ageing this would mean, for instance, that the actors interact within the constraints of existing structures of the elderly care systems, while simultaneously acting upon and restructuring these systems: innovating ways of operating. Besides certain rules of acting, the system of elderly care is also consisted of material (meaning for instance infrastructure) and non-material resources (the governance system).

Close to the same ideology is Searle's (1995) work on creating institutional facts. Institutional facts are created by constitutive rules. Searle's constitutive rule: *X counts as Y (in context C)* attempts to explain how some non-institutional phenomena are connected to institutional practices. It conceptually integrates certain non-institutional facts (X) into institutional facts (Y) in a certain context (C) (Searle 1995, 31-57, see also Pohjola 2007). Searle uses the example of money; certain bits of paper are money, only because we collectively agree it is money. This can be applied to societal institutions, like a health centre or objects, like a safety alarm. These institutional facts are dependent on social factors such as collective acceptance and mutual beliefs (see Pohjola 2007). Institutional facts mean that existence of institutions is dependent on collective agreement and must be reproduced by performative acts (Searle 1995, 54-55). A health centre is a health centre, just because we believe it is, and we reproduce it by acting there in a certain way. The contextuality is essential; the same kind of action in some other context could be interpreted differently (for instance a play).

As the study is about socio-technical systems and regimes, the essential question is the role of technology as part of the social ontology. Pohjola (2007) in his dissertation studied institutional properties of artefacts. He used Searle's work in studying the dual nature of artefacts, by which he means that they have a dual nature and are constitutive of two kinds of fact: natural and institutional facts. Natural facts refer to the physical structure and properties of artefacts, whereas institutional facts refer to the properties of artefacts dependent on human involvement. (Pohjola 2007, 11.) It means that technical artefacts also have a contextual nature; they are also dependent on collective acceptance and mutual beliefs. The main idea is that artefacts can exist only in relation to social collectives, and the creation of artefacts also creates social institutions (Pohjola 2007, 37.) Constitutive rules are the conceptual glue between the physical and social properties of technical artefacts. The idea of constitutive rules is that artefacts are relative to uses, and "are nothing without uses, just as (other) institutions cannot exist without collective or co-operative action." (Pohjola 2007, 92).

The idea of the social construction of technology has emerged in recent developments in science and technology studies. For example, the approach of the social construction of technology (SCOT) initiated and developed by Pinch and Bijker (1984) states that facts and artefacts are socially constructed, and can exist in relation to social collectives (Pohjola 2007). The roots of this approach are, for example, in Garfinkel's *Ethnomethodology* (1967) and Berger and Luckmann's *The Social Construction of Reality* (1966). However, according to the view on the dual nature of artefacts, technology is not merely material, nor pure social construction, but artefacts have both a physical and contextual nature. In addition to SCOT, the socio-technical links can also be found in, for example, the social shaping of technology (SST), actor-network-theory, (ANT) and large technical systems theory (LTS). Although these schools have different emphases, they share two basic notions of technology: a) technology is heterogeneous, not just a material contraption (Law 1987) and b) the functioning of technologies involves links between heterogeneous elements (Geels 2005).

Some of the fields of science and technology studies as action-network theory often use a micro focus on actions and interactions between individual actors in local practices and have been blamed for relationism (everything can be explained as endogenised in networks and ongoing relationships) and "flatness" (Geels 2005; 2010). By this, Geels means the idea of

Callon (2002, 293) refuting the idea of multi-level society³. (Geels 2010). Less attention has been paid to long-term processes and patterns (Geels 2005; 2010).

I agree with Geels that relationism is not a very fruitful way of explaining transition processes, but I think that it might prove useful to use the notion of constitutive rules and contextuality of technology to describe the inner dynamics in socio-technical regime. Therefore, despite this weakness in explaining change, the ontology behind the actor-network theory and science and technology studies could be useful, because it emphasises that material and social aspects are interrelated. This stream of social constructionism is called material constructionism (Kukla 2000) or artefactual constructionism (Demeritt 1988). Material constructionism is partly a criticism of the strong social constructionism⁴ where nature and culture are seen as dichotomous. The reality of the objects of scientific knowledge is the contingent outcome of social negotiation among heterogenous human and non-human actors (Demeritt 1988). Material constructivism recognises the role of technology and methods, as well as the role of material conditions and factors in knowledge formation. Material constructivism claims that the objects of scientific knowledge are the result of exercised actions and do not exist beforehand only to be revealed and properly described. Artefactual constructionism refers to construction through material interventions and interactions of the artefacts. By emphasising the productivity of scientific knowledge and practice, artefactual constructivism also denies the sharp break postulated by realism between reality and scientific descriptions of it. (Demeritt 1998, 177-178.) “We have to move constantly between technological and social: between technological determinism and social constructionism” (Akrich 1992). My study is social constructionist, but not in the strong sense, because it also includes the material aspects and physical properties of objects constructing the reality.

Giddens’ structuration theory was originally about social action, but it has been adapted and augmented by researchers interested in the relationship between technology and social structures, for instance, in information systems research, such as adaptive structuration theory (DeSanctis and Poole 1994) and the duality of technology (Orlikowski (1992), which concern the structuring properties of technology (e.g. Poole and DeSanctis 2004, see Jones and Karsten 2008). In the latter theory technology is not rendered as an artefact, but instead examines how people, as they interact with a technology in their ongoing practices, enact structures which shape their emergent and situated use of that technology (Orlikowski 2000).

I am interested in what sense, and in what mechanisms, technology is taking part in the reproduction processes of societal change. The essential question in linking technology to the structuration theory, is that if technology is seen whether as an actor (like it is seen in the actor-network theory) or as a structure (like containing the rules and being an institution). The actor-network theory seems to explain reality as network relationships and denies the existence of structures above them, but, on the other hand, in the actor-network theory, there

³ Callon says: “*You don’t need several layers, different layers. You don’t need infrastructure and embeddedness. You only need places that are connected and the possibility of actors and information to circulate from one place to another one*” (Callon 2002, 193)

⁴ A general problem in naïve social constructionism is that it becomes a self-refuting thesis and semantic paradox, because the constructionism thesis is also applicable to the constructionism thesis claim itself (= social constructionism to be a social construction) (Pohjola 2007, 39)

is the idea of scripts (the ethical rules) inscribed in the material world, that, in terms of Giddens, can be seen as some kind of structure.

A proposal to combine the action-network theory and the structuration theory in a hybrid theoretical network is made by Brooks et al. (2008), who talk about socio-technical networks as “humanchine networks”, constituting the human agency acting in association with non-human actors (including artefacts, rules and resources). Machines and technologies will have “structured orders” inscribed in them during their development and implementation (ibid, 455). This is similar to Akrich’s term of scripts (see Chapter 9.2). As technology is used, the structured orders in them will be further adjusted, which in turn, creates and recreates the structured order of the socio-technical network, being a complex set of interactions within the socio-technical network. (Brooks et al. 2008, 456)

The aforementioned view is interesting in the context of societal change and transition, because it helps to see technology as part of the reproduction process. I would argue that the duality of structures is also applied in technology in that the material world is made by people, being institutionalised and including some scripts, that in turn, enable our action, or make us act against the “rules”. For example, the physical city environment is constructed by people in some historical or cultural frames. The physical properties of environment contain scripts in the forms of accessibility, for example, in relation to which age groups certain places are intended. The same applies to safety alarm systems which include rules and scripts related to technology and use, upon and against which the end-users and care personnel act. This can be seen as age acts (see chapter 9.2), which again, reproduce the perceptions of ageing of our society, which in turn affect our action in building new environments or new technology.

Such ideas can also be found in Geels’ writings: “Social shaping of technology is accompanied by technical shaping of society” (Geels 2005, 18). Geels (2004b) agrees that rules are not just shared in social groups and carried inside actor’s heads, but can also be embedded in artefacts and practices. Geels is a representative of science and technology studies, and sees technology as a heterogeneous configuration of elements that are aligned and work together. Social and technical aspects are intertwined and constitute each other. (Geels 2005).

To summarise, the ontological approach in this dissertation is that of a social constructionist, in a sense that structural things, like rules and institutions, as well as technical objects, are constituted by social practices and collective action, and they also, in their turn, construct the social reality and frame our action. Geels and Schot (2007, 404) propose the term ‘socio-evolutionary’ to capture sociological and evolutionary processes in one concept.

The research approach gathers together technology, people and structures as intertwined elements of change. Looking at the research approach article by article, the articles need to be considered separately, because they illustrate the phenomenon of transition in different points of view and at different levels. There are differences in the ontological emphasis in the articles, for instance, the theoretical background in Article 1 has a more evolutionistic emphasis, while there are also more action-oriented views such as in Article 5. None of these articles however, denies the existence of structures or actors and thus they fit in the research setting.

8 SETS OF DATA AND ANALYSIS METHODS

Article 1: The study presents an analysis of a survey targeted at the local key persons taking part in the decision-making processes that affect regional development work. The respondents represented politicians, local authorities, development agencies and research organisations, and top managers of private companies. The focus of interest in the study was differences between opinions in the regional decision-making system. The sample survey used for this purpose produced 155 responses, equivalent to a response rate of 43%. In the survey, actors in the regional development network were asked to rate the importance of certain issues for regional development in general, and, on the other hand, the extent to which these issues were realised in the prevailing development environment. The analysis method was factor analysis.

Article 2: The dataset consists of individual interviews with the key persons of the operating system of the case organisation Oiva, which is a municipal enterprise in the basic social and health care sector operating in the purchaser-producer -model. These interviews were conducted in autumn 2008. On the production side (Oiva), the interviewees included the board (six members and one vice member) and the executive committee (six persons). The interviewees for the side of the purchaser included the purchaser manager and two members of the purchaser board. The interviews were thematic, each of which lasted about one hour, and the questions dealt with the roles and tasks within the operating system, the changes that Oiva has brought about, as well as the indicators and evaluation. The interviewees were also asked to suggest what should be improved. The questions varied somewhat according to the group, that is, whether the questions dealt with the producer or the purchaser. The aim was to map the basic elements of change; how the collisions of old and new appear in the situation of regime change. The analysis method was content analysis, in which inductive and deductive phases took turns.

Article 3: The data consists of thematic interviews among ageing users and potential future users of safety alarm systems. There were 40 people, between 62-98 years of age, interviewed in their homes and sheltered homes in different regions in Finland in May-December 2002. Most of the interviews were individual interviews, but there were also three couples and one group interview included. The interviewees were selected and approached through the co-operation organisations participating in a research and development project. The organisations were safety alarm service providers or safety alarm system suppliers, as well as municipal or private sheltered homes which had safety alarm systems in use. The interviewees consisted of 24 traditional safety alarm users, five users of wrist-care monitoring their vitality, and two test users of GPS safety telephones. Nine elderly people, who did not yet have safety systems in use, were also interviewed. The interviews focused on general experiences of safety alarms, knowledge about them, functionality of safety alarms and the related system and services, needs concerning safety alarms, and situations in which they are used. Ageing, housing and coping in daily life as well as safety and possible fears were also discussed. People's attitudes concerning novel safety technology implying possible increased control and supervision were also investigated. The data was analysed by content and discourse analysis.

Article 4: The materials collected for this research consist of interview and survey data, part of which was the same as that used in Article 3. Thematic interviews were conducted with elderly customers and personnel (both managerial and employee positions) working in safety alarm services. Interviews were conducted in 2002–2007. The survey was conducted in 2007. Interviewees comprised 44 customers and 55 care workers. Mainly individual interviews were conducted in addition to a few group interviews.

The interviews focused on how the safety alarm services were arranged, functioning of and actions in individual service processes, collaboration among care workers, the technical devices in use and their usability, information flows in the services, organisational changes involved, networking among service organisations and customers' experiences.

The customer interview data used in article 3 and described in this context was also used in this article. In addition to the data (in the interviews conducted in 2007), also experiences concerning processes related to the acquisition and use of assistive devices were investigated. The analysis method was content analysis, keeping in mind the pothole approach - obstacles as innovation potential.

The survey data was collected in 2007 and consisted of 20 survey questionnaires from care staff and customers (joint questionnaires). The survey was conducted within the sphere of a smart home pilot targeted at the elderly who had short-term housing needs related to end of hospitalisation, holidays for caring relatives and assessment of living and housing conditions. The experiences of customers and personnel, as well as the use of assistive devices, were investigated with the help of the questionnaires. The research environment in question was sheltered accommodation.

Article 5: The data consists of two surveys and set of thematic interviews that were conducted in spring 2002. The first survey was conducted by sending a questionnaire to 35 different organisations operating in the Lahti region that mostly represented the public and third sectors and were considered to be, one way or another, connected with the ageing of the population. They were sent, for example, to the social and health authorities of different municipalities and educational organisations in the region. Twenty-four organisations, or 68.6% in all, replied. The object of the survey was to map the organisations working in the wellbeing sector, the know-how they possessed, their co-operation networks and their development suggestions for intensifying co-operation. The survey also mapped new ideas for products and willingness to participate in developing wellbeing products together with other industries.

In the interview data, ten key persons in eight of the regional companies were interviewed. The companies interviewed represented the plastic, construction, furniture, vehicle, clothing, medical furniture and indoor climate product industries. The question put to the companies in the interview was: Can you see any business development opportunities for your company by means of products and services produced for the elderly, and will the core process described help your company exploit these opportunities?

The second survey was conducted by giving a questionnaire to the participants in the start-up seminar of the core process. There were 66 participants and the response rate was 48,5 %. The questionnaire surveyed the participants' opinions about core process thinking and the development of the age business. Thirty-two questionnaires were returned. The participants

were asked to evaluate on a scale of one to five, where one is the worst and five the best score, how well the core process thinking works in creating the age business network. They were also asked, using the same scale, to evaluate the opportunities of the age business in the Lahti region. The questionnaire also mapped out the participants' ideas for good ways to further develop the age business.

9 RESULTS OF THE STUDY

In this section, I will study the results of the original articles as applied in the context of a multi-level perspective on transition and explaining and describing the dynamics of the socio-technical regime. The results of the articles are utilised to describe the relationships between parts of the system.

In this context, Articles 1-2 handle the dynamics between landscape-level changes and the socio-institutional regime and also touch on the emergence of niche-level elements. Articles 3-4 deal with technology as intertwined with its environment, and the regime-level dynamics between different subsystems in the regime. The contextual and constitutive technologies of ageing are brought to the fore. Article 5 deals with facilitating the emergence of niche-level innovations such as building an innovation network around opportunities offered by ageing, where different backgrounds meet.

9.1 Dynamics between levels: overcoming the collisions

In the context of a multi-level perspective on transition, Articles 1 and 2 describe the dynamics between levels: the changing landscape exerting pressure on the regime, which appears to destabilise the regime. Landscape level factors can also trigger niche innovations, as well as create opportunities for niches.

In Article 1, which deals with the shift of a techno-economic paradigm to the information era, and the regional adjustment, the question is very close to the question of inertia between landscape changes and the regime level, which here is represented by regional actors and decision makers. The question here is about the problematic effects of a new megatrend and change of paradigm to regions and organisations. The regions and organisations are settings for many opinions and contrasting ideologies. This confusion can constitute socio-institutional inertia, preventing the region from taking the steps needed for development. Inertia arises, for example, from sticking to a declining industry or to a prevailing operational model characterised by routines and stable social relationships.

Adaption to the change of techno-economic paradigm and the emerging megatrends, like ageing, requires a change in thinking as well as a change of structures. Such new thinking is required in many levels, for example, the regions and organisations. However, certain lock-ins caused by the path-dependent nature of regions and organisations create inertia in change. In this context, *dynamic capabilities* (see Teece et al. 1997) are defined as the region's ability to generate competitive development paths in a turbulent environment. Dynamic capabilities aim

to reform regional resource configurations based on the history of the region and opportunities emerging from the techno-socio-economic development (Harmaakorpi 2004, 110). However, by renewing and helping to exploit regional resources, dynamic capabilities also play an important role in solving regional lock-ins and reducing socio-institutional inertia.

As the results of Article 1 show even though the regional actors are reasonably well aware of the ongoing change and the prevailing techno-economic paradigm and the dynamic capabilities needed, it is difficult in practice for a region to change its patterns. The old-fashioned hierarchical and bureaucratic ways still prevail in the region, even though the importance of different types of social capital is understood. Article 1 forms a background to understanding the effects and relationships of landscape-level changes to practices and structures concerning ageing.

Article 2 deals with a case that can be considered a niche-level experiment that encounters the existing regime in social and health care. The article describes the clashes that appear when a new business-oriented model, regarded as a niche-level innovation created on the fringe on the regime, is embedded in a public sector environment that is accustomed to working a certain way, but which reflects the regime change. The collisions are embodied, for example, in the controversial expectations of the role of the service user, and they are often related to mental lock-ins creating socio-institutional inertia. However, there may be problems in the collisions due to opposing powers if there is an inability to recognise what the effects of the collisions may lead to. One example of these is the role of the user in the purchaser-producer model in the public sector, and simultaneously fostering emphasis on customer-orientation. However, the producer-purchaser model in the public sector separates the citizen needs and customer needs. The purchaser represents the needs of citizens as tax payers, but it gains access to the feedback from the actual service users indirectly at best.

Between the levels, there is inevitably some inertia due to cognitive and mental lock-ins that hold onto the stability, but, in times of change, need to be broken. Existing regimes as established systems are also characterised by stability, inertia, lock-in and path dependence. (Geels et al. 2004; Geels 2010) Actors and organisations are embedded in interdependent networks that create stability through mutual expectations. These cognitive routines may cause blindness, inability to look at other directions outside the regime. (Geels et al. 2004, 7). This has been blamed on the public sector, in particular, where the present strategies tend to steer the action (see e.g. Marsh and Edwards 2009). Niches that help to bridge the gap between the current regime and the new one can be called pathway technologies (Kemp and Rotmans 2004, 158), but, as a widening concept of innovation supports, the concept could be widened and generalised to be *pathway innovations*, taking into account that niches can also be other than technologies, such as organisational or administrative innovations, as in the case of Article 2, where there is a question about the embedding of a new organising model in social and health services.

For example, the pressures being exerted because of the ageing of the population influence the thinking and structures of service production. The ageing of the population means both the decreased workforce and the increase in those in need of services. This equation is forcing municipalities to apply completely new operating models to maintain a satisfactory municipal service system. The existing regime of welfare state with public value ideologies is

destabilising as there has been pressure to increase the productivity of the public sector. As the first steps towards a new way of thinking, there has been pressure for new operating models and structures in organising the public social and health care. Places for innovations, that utilise the way of thinking familiar to the private sector and business economy with demands of productivity etc., have emerged.

As the public sector has adapted the way of thinking previously familiar to the private sector, this has destabilised the rule systems of the regime, because of distinctive differences, concerning goals, values and contexts between the sectors. In terms of Geels', these contrasts and collisions between them can act as "windows for opportunity" for new solutions coming from outside the existing regime, from the niche-level. As seen in the form of various collisions, regarding the innovation in the public sector, it is central to notice that new models applied from another context are not necessarily successful innovations as such, but the focus should be on adjusting those models. However, these collisions can also act as a platform for innovations when opened up, analysed and overcome with "second-level" innovations. In order to realise the innovation potential lying in these collisions and to utilise the "window of opportunity" in times of regime destabilisation, these innovative practices are needed to bridge the gap between old and new thinking.

On the basis of the idea of seeing the collisions as innovation potential, further linked to the idea of various types of distance as a source of innovation, which implies that there is a huge innovation potential in combining different fields of knowledge, I call the inertia breaking here "distance management", adapted from the "strategic niche management" perspective introduced by Schot et al. (2004) and Kemp et al. (1998), which tries to address the problem between radical novelties and market introduction (see also Schot and Geels 2008). Strategic niche management is a quasi-evolutionary perspective, stating that variation and selection are not blind, but can be directed and shaped to some extent (Schot and Geels 2008). Strategic niche management is based on the idea that technical change may be locked into dominant regimes, and there is under-utilisation of many promising technologies, for example, because of barriers in fitting into existing technologies, government policies and cultural values. Strategic niche management is the creation and management of niches for promising technologies, and acts as a stepping-stone that facilitates change in a new direction. Besides the creation of protected spaces for the development of promising technologies, it also means making institutional connections and adaptations between companies, researchers and public authorities. (Kemp et al. 1998.)

Distance management utilises the potential of distances in collisions. Collisions are created by processes between and within the levels, but to use the innovation potential lying in the collisions, the collisions between different knowledge-bases and working cultures can also be revealed and even purposefully created – to which the term management refers – by second-level innovations, by which we mean innovative practices that can be either innovations changing the ways of *making* innovations, or innovations changing the ways of *embedding* or implementing innovations. In Article 2, examples of these innovative practices are new models for integrating service into the activities of the service users and the work practices of the health care professionals, as well as fostering bottom-up innovation and including customers and grassroots level personnel in the development of services in an innovative way, for instance, by creating arenas for intellectual cross-fertilisation inside the organisation, as well as in the interface of organisations in each phase of the development.

Another purposeful way to make the distance management, by building multi-actor networks of ageing, is presented in the case of Article 5 in Chapter 9.3. Network formation and new network relationships are also suggested by Kemp et al. (1998).

In both Articles 1 and 2, the question is about breaking the inertia between levels. Besides renewing the regional resource configurations, dynamic capabilities like leadership capability, visionary capability and networking capability are needed to break the lock-ins inside the existing regime. This can also help in reducing the inertia between the landscape-level (and the visible changes in the whole techno-economic paradigm) and the regime. Distance management is a way of reducing the distances inside the niche-level, as well as the distances and inertia between niche- and landscape levels. (see Figure 3).

The main conclusion here is that a change of regime is based on the dynamics between levels, not creating new models as innovations as such, and therefore attention is paid to facilitation tools in the dynamics and overcoming and exploiting the collisions.

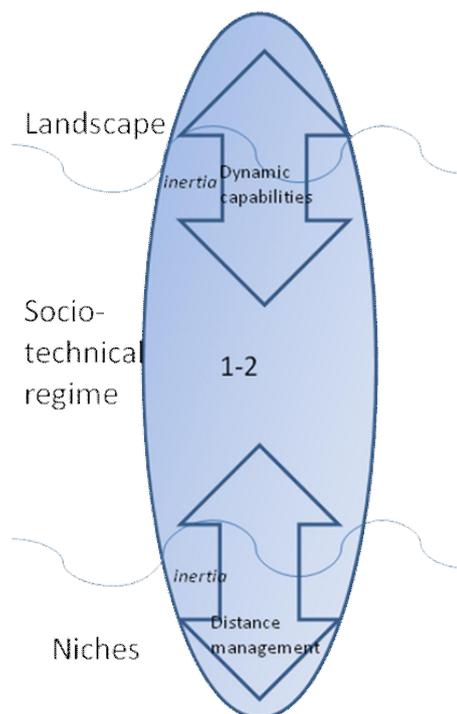


Figure 3. Dynamic capabilities and distance management as breakers of inertia and collisions between levels.

9.2 Inner dynamics of the regime: socio-technical relationships in the case of safety alarm systems

Articles 3 and 4 deal with the inner dynamics in the regime level from the point of view of technology as intertwined with its environment. The question here is a study of a socio-technical system, which encompass production, diffusion and the use of technology that are interrelated and mutually dependent in practice (Geels 2004b). This perspective stresses that social and technical aspects are strongly interlinked, and the functioning of technology is dependent upon its relationship to other elements (Geels 2004b, 2005).

As Geels states, the stability of existing socio-technical systems occurs through interaction between the material aspects of the system, embedded actors and organisational networks, and the rules and regimes which guide perceptions and actions (e.g. Geels 2004b, see also Genus and Coles 2008). A socio-technical regime includes actors and artefacts, whose practices develop the rule set of the regime (Verbong and Geels, 2007) Artefacts are never used in vacuum, but always in an application domain, which is structured by regulations, user practices, symbolic meanings and maintenance organisations. This context is not merely passive, but actually helps the artefact fulfil a function (Geels 2005, 11) And, as I will argue, the study of the regime-level dynamics is not meaningless, because a contextual study of technology reveals its connections to the different perceptions of ageing, which also affects the policy level, which is also a decisive part of the transition.

In the study of socio-technical relationships, the focus is on safety alarm systems as they represent quite a simple and established technology for the elderly. For this reason, safety alarm systems can be seen as part of an existing and established socio-technical regime of elderly care: they have been in use since the 1980s. However, as several studies have noted, established technology also has a contextual nature and can be used in various ways in different contexts. The designers have also noted that a holistic approach to technology is needed; a step forward from user-centred design to a more holistic dimension is a life-based design (see e.g. Leikas 2009). In socio-technical analysis, the relationship between the technology and the user is more than diffusion (success of an innovation explained by emphasising the innovation's intrinsic qualities) because technology and the social environment that adopts it, simultaneously shape each other. (Akrich et al. 2002a; 2002b)"To adopt an innovation is to adapt it."(Akrich et al. 2002b, 209) The innovation is transformed, modified according to the site where it is implemented through multiple socio-technical negotiations (ibid).

The starting point of this part of dissertation is these above-mentioned negotiations at the regime level: between safety technology, perceptions of old age and perceptions of innovations, intermediated by the users and the care workers. The question is dealt with in the case of safety alarm systems, that are considered to be a piece of assistive technology for the elderly, but more careful consideration shows the many meanings of this technological apparatus. The basic argument here is that technology is not a separate entity, but is contextual and multi-dimensional, and is "created" through its material aspects and its usage, for example, the use of technology and the speech about it constructs the age concepts of our society (see Figure 4).

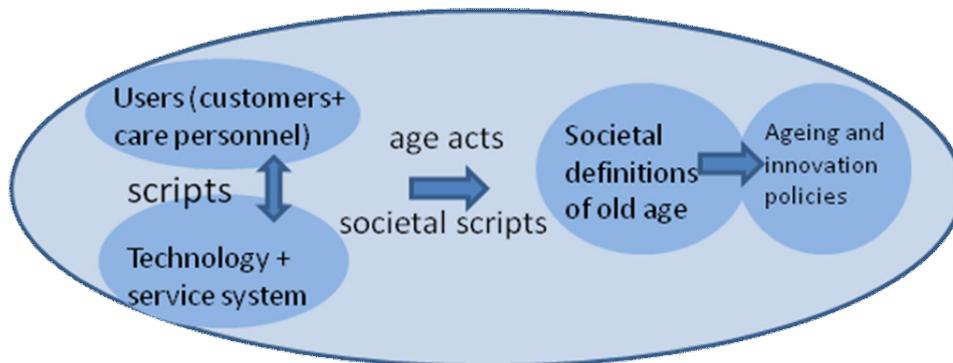


Figure 4. The socio-technical dynamics in Articles 3-4.

The contextual nature of the safety alarm is based on the ontology of the dual nature of artefacts; besides the physical properties, they have institutional statuses that are made by collective action. (Pohjola 2007). There is a constitutional relationship between natural and institutional facts (see Searle's constitutive rule, Chapter 7), and these constitutions are created through intentional action (Pohjola 2007, 71).

As shown in Articles 3 and 4, the safety alarm is much more than physical components. The technical properties of the safety alarm, like the size and stiffness of the alarm button, defines who is able to use the safety alarm. On the other hand, the institutional nature of the safety alarm means that the safety alarm is a safety alarm just because we believe so, and an institution is built around it. More broadly, the ways of using the safety alarm, and the ways to talk about it are part of creating the perceptions of ageing in our society. In the case of the safety alarm, it is not insignificant that the safety alarm system is a large service network that consists of a variety of actors (e.g. Melkas 2004), that all constitute the technology.

The properties of the safety alarm button and its restrictive elements affecting its use, describes the nature of technology connected to social practices. Technology is not innocent, but in the terms of Madeleine Akrich, it has *scripts*; technical objects define a framework of action together with the actors and the space in which they are supposed to act. (Akrich 1992, 208). The question is how a technical object constrains actors (or *actants*, as Akrich refers to human and non-human actors) in the way they relate to the object and to one another, as well as actants reshaping the object, and the various ways the object may be used. (Akrich 1992, 206.) Technical artefacts have normative prescriptions. By prescriptions, Akrich means the behaviour imposed on the human by non-human actors. (Latour 1988). Ethical issues, rights and obligations are transformed into technological devices; the physical properties of artefacts often tell us the way we should behave. A heavy hotel key, for instance, made to be unwieldy to carry, imposes a rule upon the client to leave the key at the reception, or automatic

violently slamming door mechanisms imply we should pass through quickly. (Latour 1988; Latour 1992.) Technological devices, like the key, incorporate the mutual relationships between people. The same applies to the safety alarm, for example, in the case of false alarms, the technology creates the relationships between the user and the care person that would not otherwise exist.

The development of technology is not value-neutral; it is itself a social practice involving, for instance, ethical values. Likewise, ethical practices have material sides because they entail specific organisations of concrete interpersonal relationships that are always technologically embodied. (Widdershoven 1988, 105) The meaning of physical properties are essential for people with disabilities. They may be left outside if the physical environment does not enable one to use the technology. Besides high and low technology, the physical environment has scripts. This is connected to the view that disability can be viewed as not a person's property, but as the property of relationship between a person and his or her environment. In this sense, all the environments that are inaccessible for older people because of physical restrictions can be seen to contain those scripts.

My point here is that the small-level contextual scripts can also form broader societal scripts, by which I mean that technological scripts contribute to defining old age at the society level. Technology, through its usage, creates societal perceptions of old age, or perceptions of innovations of ageing, which, in their turn affect the formation of policies for innovation and ageing. For example, the discussion about older people as users of technology is one way to construct and reproduce the old age, which is seen for instance in the visions of the information society, where the elderly are considered to be a risk group in danger of being excluded from the information society (see e.g. Sankari 2004). However, there are various kinds of technology in the lives of older people and this technology plays various roles in society and in the every-day lives of older people. The discussion on the acquisition and use of the safety alarm reveal several aspects of old age, which can be handled as "age acts" or "age speech" producing old age. Age based norms are maintained by ideologies which are resistant to change (Ginn and Arber 1995). Understanding how cultural perceptions of age are produced is important from the point of view of a service system, because public policies are often built on the basis of these (often stereotypical) perceptions (Rintala 1999).

Vakimo (2001) talks about *age acts* as one of the frequent ways to produce the cultural meanings of the old age. Age acts are every-day actions taken in social interaction, actions producing one's own or other people's social age, or actions defining oneself or others within the category of the elderly (Vakimo 2001, 37). Getting biologically old is an automatic and continuing process, but the social and cultural meanings of age are negotiated in every-day interaction situations. Leading one's every-day life in terms of social actions that one considers to constitute part of an old person's life can also be considered an age act. (Vakimo 2001, 37-38.) Walkers, walking sticks, etc. are often labelled as age-markers or signs of old age, (Featherstone and Hepworth 1991, see Leinonen and Rantamaa 2001). The use of assistive technology, such as safety alarms, can also be considered as an age act related to later life, while other technology, such as computers, mobile phones and console games are often considered to be part of the younger generation's everyday life. Active participation in the information society can even be considered an anti-ageing act, an act of crossing the generations (Jokinen 2002), as well as talking about an older person using the Internet *despite from his or her age* (see e.g. Sankari 2004).

As noted in Article 3, the discussion about safety alarms is also often connected to the discussion about age (because they are targeted at older people and their relatives), and therefore can be regarded as one element in constructing an age. In the article, the discussion concerned the concept of agency, – the definition of agency is based on Giddens' (1984) idea of agency as to be able to 'act otherwise', being able to intervene in the world or to refrain from such intervention. (Giddens 1984, 14). The age acts discussed by safety alarm system users were related either to strong or weak agency. The age acts of strong agency were 1) the role of a safety alarm as activating and empowering, 2) commenting on later life as obedience to the service system (seen as rule-breaking), 3) commenting on later life as dependence (when struggling alone as long as possible without raising an alarm), 4) stressing the old person's own responsibility for his or her health and life (safety alarm system as an individual choice to avoid the possible risks related to later life). The age acts related to weak agency describe the restricted choice of the users, and these were 5) making the relatives feel safe 6) trust in the experts 7) indifference about the safety alarm as a part of life 8) obedience and not questioning the (sometimes unpractical) rules; 9) stressing the practicality and functionality instead of aesthetics and 10) being a user of the safety alarm system as a sign of being old and to be avoided as long as possible. Because the use defines the safety alarm, in this sense there is not just one safety alarm but several, produced in several contexts. For some people, it is the positive and purposeful sign of needing help, while for others it is something to be ashamed of (see Pekkarinen 2003).

As shown, there are constant negotiations between the user and the service system about the use of the safety alarm. In a follow-up study (Molander 2003), as many as one third of the alarm calls were regarded as unnecessary, including calling by accident, asking what time it is, or just wanting to talk to someone. These "niche" uses (user practices not fitting into the official system) should not be neglected, because as *anomalies* they can create new practices. The term anomaly is borrowed from T.S Kuhn's studies about scientific paradigms, which, in my view, has some similarities to the role of niches in the regime change. According to Kuhn (1970), when enough anomalies have emerged against a current paradigm, the scientific discipline will experience a crisis. A scientific paradigm shift occurs when an old model of knowledge and practice cannot accommodate inconsistencies or challenges arising from a new experience, and when a replacement paradigm offers a better foundation for progress. This implies that users can also create niches that may have implications in the regime change.

Besides, as Article 4 shows, opening up the various perspectives of ageing, the study of the safety alarm broadens the insight of technological innovations to be linked to other perspectives of innovation. A technological device, like a safety alarm, is not created and used in a vacuum: there is an organisation and service acts behind the technology, and essentially there is a user with his or her values, appreciations, health, living environment etc. All these have an impact on seeing the variety of innovation and innovation potential in assistive technology. Innovations related to ageing also mould the social reality and social perceptions of ageing.

The context-relatedness of technology also means the variety of potholes, such as challenges, difficulties, weaknesses and threats that have negative effects (by causing extra costs, increasing the work burden of the care staff and causing customer dissatisfaction) (Pekkarinen and Melkas 2010; Melkas 2008), that are linked to aspects of safety alarm systems. Article 4

shows that besides pure technical problems there can also be others such as service, process, organisational, marketing, social and ethical problems. Opening up the safety alarm system to different perspectives helps us to see the safety alarm system as a holistic innovation with several perspectives of innovations. It can also be seen that the technology may be even useless if the environment does not support its use: the safety alarm system only partially helps an elderly person live in her home, if the home is in a block of flats without a lift. (Pekkarinen 2003.) Again, the question of innovation here is not necessarily about cutting edge technology, but working connections between systems. In the case of safety alarm systems, to speak about holistic innovations, it would be essential to make and improve connections to other elements and service systems, because the feeling of safety and the ability to live independently are dependent on the holistic situation of the person, not just the safety alarm. Besides ease of use and physical suitability, the usability of a product means integration into the holistic situation of the user, which can be improved by knowing about lifestyles of the the elderly. (see e.g. Karisto and Konttinen 2004).

The context-relatedness of technology also means that the safety alarm can be viewed from two angles: compensating for the dependency by providing safety, but also an opportunity for new ways of use and new markets. Not understanding the contextual (and constructive) nature of technology may also cause increasing ageism in society. Technology is not innocent producing perceptions of old age, but there is a certain controversy: if gerontechnological products are designed to be assistive, they may be an age act reminding one that one needs help. On the other hand, if the emphasis is on gerontechnology being liberating, activating etc; it excludes those who are not capable of using it.

9.3 "Distance management" by building multi-actor networks for innovation of ageing

Ageing as a demographic and social phenomenon is a landscape-level issue in the multi-level perspective of transition, but prevailing cultural perceptions of old age, as cognitive rules can be regarded as a regime-level phenomenon. Prevailing perceptions of ageing in society, according to Rintala (1999), influence public policies and service production for the elderly, for example, if the focus of the service production is on home health care or institutional care. *Vice versa*, the images and perceptions of ageing are also constructed and reproduced through the structures of society. Different perceptions of ageing also produce different innovations; seeing old age as an active and productive time of life produces different innovations than seeing old age as adapting to sickness and frailty. This, in turn, will shape the public policy for the ageing population (Coughlin 2008). It may also affect the focus on innovation policies; whether the focus on development is in the public or private sector. Seeing the two sides of the coin of ageing shake up the existing regime, and may offer windows of opportunity to (niche-level) novelties.

This implies that the innovation activity of ageing may also be approached from two directions: 1) threats; new products and operating models are needed so that scarce resources can be made to meeting the needs of a growing group of older people, and 2) possibilities; innovations that are related to support the new vision of ageing being a resourceful time of

life; i.e. innovations related to services and free-time products: travel, sports and cultural activities.

Article 5 deals with the management of innovation activity related to ageing, through the case of the age business. It is based on the opportunity point of view on ageing, that is, the idea that the ageing of the population provides new business potential for companies and new challenges for regions globally. In the literature, the idea of “age business” is also described as “graying market” or “silver market” (see e.g. Kohlbacher and Herstatt eds. 2008), the market segment broadly defined as people aged 50 or 55 and older (ibid, xi) “Age business” means business and service activities that serve the needs of elderly people without treating and labelling them as a special group. The term could just as well be ‘age-sustainable business’ taking into account the needs of customers and consumers of all age groups. Age business includes all the technology, services and business that promote, support and maintain a person’s everyday life, health, social wellbeing and communication. (Pekkarinen and Harmaakorpi 2006). Age business means both the production of goods and technologies, as well as various types of services. The service sector of the age business includes various services from social and health services to culture and travel services.

The article offers a concrete case study of giving a practical form to a network aiming at exploiting the regional resource configurations connected to the megatrend of the ageing of the population. The core process thinking is an example of intentional action to take advantage of future opportunities in a multi-actor and multi-sectoral network and therefore can be regarded as an attempt at transition management. As Kemp et al. (1998) mention, there is a danger that because of opposing interests, there are many examples of actors trying to slow down or even stop the niche from developing, and therefore new network relationships should be developed, in which public authorities may be of help. They may also help to create and articulate a goal for the network, which would help to coordinate the strategies of developers, investors, regulators and users. In order to have a major impact, these goals must be accompanied by policy measures. (Kemp et al. 1998, 191.)

The innovations of ageing, like age business and wellbeing products are a multi-disciplinary and multi-expertise area that combines research in the social and wellbeing sector, management of production and services, etc., without forgetting the end-user as a source of information. Those involved in the development may have little common knowledge, but the challenge is that the collaboration of a number of competences and cultures is required (Capecchi 1996, 178). As the results of the article show, the ageing of the population as a phenomenon was reflected in both public social and health care sectors, as well as in the traditional manufacturing industries,⁵ and the idea of the age business as a platform for co-operation was favourably received by those involved.

What is important in relation to a multi-level perspective on transition is the idea that if the core processes possess enough bridging social capital (Granovetter 1985; Putnam 1995), they can avoid harmful lock-ins caused by collective blindness (Tura and Harmaakorpi 2005; Harmaakorpi 2004). The role of collaboration is seen as being especially important in such a process, which is not just about the market logic, but also about social effects. There is a great

⁵ The data was collected in spring 2002, when the great discussion on the effects of ageing was just beginning in Finland.

range of participants, needs and work cultures in such a process (Capecchi 1996, 189–190), which can be seen as a form of collective learning.

Building innovation networks that combine actors and knowledge from various fields can be perceived as tools for distance management (see also Chapter 9.1). Embedding and orienting the niches are crucial transition elements, and creates a demand for tools. (Kivisaari and Saranummi 2008; Kivisaari et al. 2009) Several approaches have been suggested concerning directing and orienting the technical change into social goals, and facilitating the diffusion of radical innovations, for example, the strategic niche management approach (Kemp et al. 1998), the transition management approach (Rotmans et al. 2001), and the societal embedding of innovations approach (Saari and Kivisaari 2009; Heiskanen et al. 2009; Kivisaari et al. 2009). All these approaches have slightly distinctive focuses, but the common idea is to strengthen the dialogue and interactive learning between stakeholders in different levels. The idea behind such a ‘quasi-evolutionary perspective’ is that variation is not blind, as is assumed by many evolutionary economists, but directed to some extent. (Schot and Geels 2008).

Distance management stresses the potential of distances in change. Distance management can be used in a collision, like in Article 2, as well as in purposefully creating niche innovations. The article 5 suggests that traditional manufacturing industries combined with the knowledge from social and health sectors can provide fruitful innovation potential. The knowledge in manufacturing industries is typically rather distant from the regime of the social and health sector (which has dominated the issue of ageing), but when this knowledge can be exploited in the existing regime it also creates the potential to change it and bring new dimensions to the new regime of ageing. As noted, however, the challenge is how to consolidate the different forms of distances with the positive learning processes. Burt (2004) talks about the need for information brokerage in the structural hole (ks. Parjanen et al. 2010). Cognitive routines act as stabilisers of existing regimes, but they also prevent developers from broadening their focus (Nelson and Winter 1982; Geels and Schot 2007). According to Geels, many of the niches collide with the regime because of the inertia and lock-ins. The lock-ins may be stuck in a certain view of old age or innovation. One idea of the core process thinking would be to connect the knowledge of the furniture industry to the knowledge in the social and health sector and this distance could create innovations and facilitate the transition.

It would be useful to connect the strategic niche management -approach and its idea of creating connections between actors on different levels to the principles of open innovation, where distances and connecting various types of knowledge are seen as essential ways to produce innovations. Consolidating and brokerage helping to cross the inertia are needed, however, to utilise the power of distances. (see also Chapter 9.1)

The potential of the age business is to act as a “platform of brokerage” for the niche-product developed in the traditional manufacturing industry. This platform can act as a broker of interaction in creating niche innovations, as well as between niche and regime levels. As there are actors in the network that represent the regime and there are also outsiders, the network forms a channel to introduce the anomaly to the regime. Destabilisation of the regime creates windows of opportunity for niche innovations, and the regime may gradually adapt new ways of thinking (which affect the societal structures) because of this anomaly. As Geels notes, the niches act as important “seeds” of transition. In the context of ageing, niches can be created

with very long distance to the regime, as in the furniture industry, but if the windows of opportunity are opened because of the changes in the landscape and in the regime, the niche could foster or redirect the change. (See Figure 5).

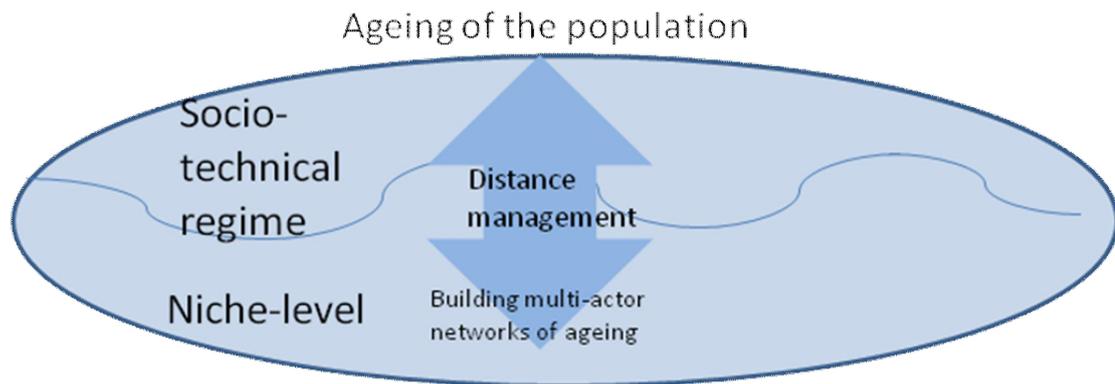


Figure 5. Distance management between niche and regime levels.

10 CONCLUSION

One of the basic arguments of this study is that the regime of ageing is experiencing changes and can be perceived as reinforcing itself as a regime, which is not only being part of the social and health sector, but also has wider societal interlinks. As a response to landscape changes inside the regime, there are changes going on related to the service system and to the changing perceptions of ageing and the elderly. There is also change going on in the preferences of the elderly as service and product users. Likewise, the emergence of the open innovation principle has led to discussion and created some local practices involving the elderly users in the service production. For example these together are interrelated and reinforce each other to contribute to the new regime in the field of ageing. However, even though landscape changes appear and there are radical niches in the field of ageing, they will not change the regime as such. The focus should be on the boundaries of levels and the processes taking place there, since there are collisions and inertia in the times of change. Therefore, the role of dynamic capabilities (like leadership capability, visionary capability and networking capability) and distance management (utilising brokerage tools like theatre-based methods) are presented in this study to break the lock-ins and tackle the collisions in these boundaries. The collisions can act as barriers to change, but when managed and brokered purposefully, they create opportunities and act as sources of innovation.

Special attention has been paid in this study to the internal dynamics at the regime level, for instance, the relationships between technology and its environment. The role of technology and technology users are regarded as creating perceptions of old age, for example, and the role of these perceptions in defining the policies that direct the change. It is worth noting that national innovation policies which have been reformulated through a widening concept of innovation, remarkably affect the development pathways of society. This means that understanding innovation other than merely technological products has opened up support mechanisms to the wider development of products and services related to ageing. Paying attention to socio-technical relationships indicates that supposedly very trivial things (like the size or colour of the safety alarm button) together with other supposedly as trivial things may have wide societal impacts in the long run, because of their interrelationships. The change takes place through the continuing structuration process.

The changing landscape affects the way that old models of organising health care are no longer working well, but there are also challenges in adopting and embedding the new models (studied in the article 2). The collisions and socio-institutional inertia between levels are the result of mental and cognitive lock-ins. The lock-ins create stability in systems in the forms of certain rules and belief systems, but may also cause inertia, for instance, when external landscape pressures create instability in the regime. There may be controversial tendencies in belief systems, for example, whether to emphasise the public value or individuality in elderly care. There are opposing aims, inability and even resistance to change even when there is awareness of the direction of the needed change. However, the instability creates windows of opportunity for novelties, and in this way the collisions may also act as a platform for innovations when opened up, analysed and supported by brokerage tools. This study emphasises the role of distances in the niche level novelties, and in this phase intentional action with measures and tools come into the picture. The role of dynamic capabilities and brokerage tools, for example, may help to take decisive steps for development.

In this dissertation the elements and mechanisms in the change of the socio-technical regime (Geels and Schot 2007) in the field of ageing have been analysed, through some case studies presented in the original articles. The question of regime transition is studied through interrelated changes at the landscape-level, regime-level and micro-level niches. To summarise the results of this study and connecting Figures 2-5, Figure 6 describes the ongoing dynamics in the field of ageing.

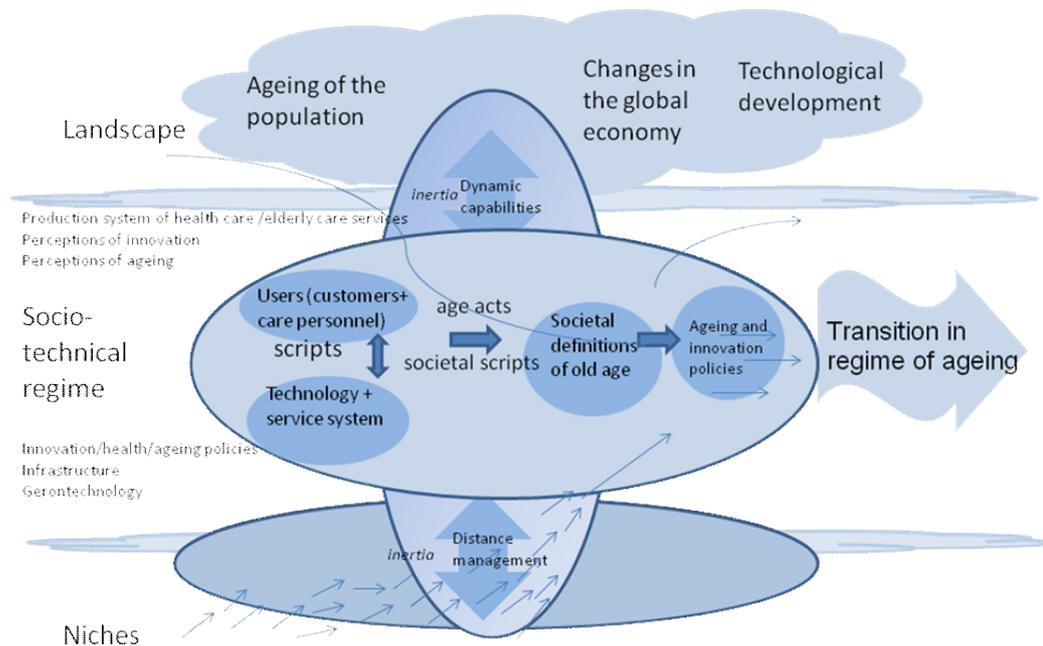


Figure 6. Multi-level perspective understanding the change in the field of ageing (formulated from Geels and Schot 2007).

At the landscape level of ageing, which creates the pressures and triggers to the regime change, I have taken three remarkable trends: demographic change, changes in the global economy and the development of technologies. Related to this, Kivisaari and Saranummi (2008), distinguish the trends and factors of change of health care in Finland connected to the health care system (mastering the costs), market trends, technological trends (unite electronic epicrisis, medical technology), and societal trends (ageing of the population and changing life styles).

The landscape-level changes reflect on the socio-technical regime (the meso-level of the figure), which as a rule system experiences changes as new markets, new ways of perceiving ageing, new consumer habits, new models of organising the health care and as new ways of considering innovation and innovativeness. There are also inner dynamics within the regime, where there are the policies, organising models, technology and infrastructure, together with scientific understanding and other belief systems. These are interrelated and co-constructed: the prevailing perceptions of ageing and innovation, for instance, reflect the ageing policies⁶,

⁶ According to Vaarama (2009), ageing policy is an instrument of the society to secure solidarity between generations essential to political sustainability, and to mould the society a best possible living environment for people of all ages. Thus ageing policy is between generations by nature and by default. It also transforms our notion of old age and the possibilities of good ageing, as well as the roles offered for the elderly.

innovation policies⁷ societal structures, organising models, technology and scientific discussion, and *vice versa*.

Inside the regime there may be a structural lag (Riley and Riley 1994), which means the slow development and inelasticity of social structures lead to a situation where offerings of the environment and the needs and expectations of the older people are not encountering. If the opportunities provided by the social structure are designed for the young and most of the older people are not sufficiently capable, the structures deprive them of productive roles, and this reinforces the image of older people as non-productive and dependent.

Technology is part of the dynamics inside the socio-technological regime. As noted in the context of safety alarms, technology, and the use of and discussion about it, helps produce and reproduce the perceptions of old age. Physical properties of the artefacts set limitations and opportunities with regard to their functions and uses. Technological innovations create new social practices, and, in this way, are also social innovations (see e.g. Pohjola 2007). When the various sides are looked at, we see that the concept of innovation and the concept of ageing are intertwined. The contexts of use shape the notion of innovation, as well as images of ageing, which, in turn, affect the kind of innovations that are produced.

The landscape level changes alone are not the only triggers in the regime changes, but micro-level changes are also needed, in form of niche-innovations (Geels 2005). Kivisaari et al. (2004) pay special attention to the role of these experiments in the transition. Regimes, as stability-striven systems, tend to generate incremental innovations, but radically new innovations are generated in experimental niches protected from 'normal' market selection. (see also Geels 2005). Innovations can break from the niche level if the circumstances are favourable. The windows of opportunity may be opened by tensions in the socio-technical regime; for instance, the landscape level changes may lead to pressures on the regime. (Geels 2004; Kivisaari et al. 2004) There is a continuous definition and redefinition of the aims and concepts in the innovation policy and activities, for example. According to Perez (2004), in the periods of change, the economy and socio-institutional structures face a chaotic and unaccustomed situation requiring deep changes. There are no proven recipes and change has to take place by trial and error (Perez 2004, 17).

This study is not about systemic evolution, but one of the viewpoints in this study was the role of the agency in the dynamic socio-technical change. In this relationship, an important question is how can the transition be mastered and managed. Ageing as a landscape-level megatrend has societal effects in terms of changing structures. However, the structures do not change on their own but are the end result of human action. On the other hand, the question of change is not merely about rational choice, because the action is framed by certain rules and structures. This study is based on view that the change takes place in the structuration: human action is filtered by societal structures, which in turn are constituted by social actors. The

⁷ Innovation policy is an entity of policy actions promoting production, broad-based diffusion and exploitation of new knowledge. (Kuisma 2006). Traditionally, the scope of innovation policy has been to enhance science-based innovation processes, based on Science Technology and Innovation (STI) mode, but a broader definition of innovation policies covers also the practice-based innovation policies, based on Doing, Using and Interacting (DUI) –mode (see Berg Jensen et al. 2007; Harmaakorpi et al. 2010).

mechanisms of change are based on the idea of the dual nature of structures (Giddens 1979; 1981; 1984) which means that these multi-actor networks become institutionalised as practices and structures, and reinforce the development of support mechanisms for multi-actor innovation, and simultaneously⁸, innovation structures create opportunities to develop such action (structures as enabling). This also means that changes in institutions, like health care practices, are constituted by social actors, but at the same time the institutions determine and set rules of action. Innovations of ageing are fundamentally multi-voiced phenomena, and presuppose actors from various sectors. On the other hand, building the multi-actor networks where distances can be utilised may presuppose changes in structures and institutions. The belief systems, like scientific and practical understanding, are considered structures that lead our thinking but meanwhile are under negotiation. Furthermore, it should be noted that economic, cultural, technological and institutional developments have their own dynamics: cultural changes take place slowly, economic changes have more rapid fluctuations, whereas institutional and technological changes are somewhere in between (Rotmans et al. 2001).

The role of niches in explaining the change and promising improvement and progress is based on their nature representing 'things new to the world', out of the mainstream (Raven et al. 2010). This is close to the notion of distances as triggers for change and innovation. In the transition, it may be difficult to draw a boundary where novelties are created outside the regime and which are almost inside the regime, already affected by the change. This is the case, for example, in the organisational pilot model presented in Article 2, as well other examples in social and health care sector niches (e.g. Kivisaari and Saranummi 2008). Therefore, I would argue that according to the emphasis on the open innovation principle even more attention should be paid to the elements of distance in the niche innovations. In the context of ageing, this means more attention should be paid to niche-novelties coming from completely different sectors other than the social and health care sector. The greater the distance of the niches to the prevailing regime, the more radical and large-scale the change, but while the niche has some support from the regime, the embedding is easier, but the change is more incremental.

One important notion is that innovations of ageing are recognised as a multi-sectoral phenomenon, combining different kinds of knowledge, for instance, gerontology, marketing, process development, manufacturing, communication, information technology etc. Many tensions and different distances are linked here. It is not sufficient to develop the niches just in social and health care, but more radical distances must be used. I would argue that to help the transition there should be elements included that really are created outside the regime in another branch or industry, to have a real "creative destruction" (Schumpeter 1934). According to Kivisaari and Saranummi (2008, 287), the transition in the health care presupposes deepening the partnership between public and private sectors, and the same applies in the field of ageing. Because of their power based on distances, directing and embedding the niches are essential elements in the transition and it needs tools. Strategic niche management and societal embedding with hybrid actors should have more attention paid to them to facilitate the diffusion of radical innovations (e.g. Kivisaari et al.) As mentioned, too much distance or proximity is not fruitful for change and innovation, but there should be an interplay between them (see e.g. Harmaakorpi et al. 2006; Parjanen and Melkas

⁸ There is no unanimous view about the causal mechanisms between actors and structures: the representatives of critical realism, like Margaret Archer, have pointed out that if structuration is seen to be simultaneous, this does not explain the causal relationships between actors and structures.

2008.) In the transition context, factors facilitating the transition are essentially based on distances, and their management in a fruitful way. Too much proximity (e.g. inside the established regime) creates lock-ins which increase the distances to other directions. Utilising this potential and balancing proximity and distance and in this way breaking the windows of opportunity, presuppose the tools of brokerage. As an aspect of niche management, I suggest the development and use of these brokerage tools, examples of which helping to find the common “language” between the actors coming from very different backgrounds, are innovation session method (see Pässilä et al. 2008; Parjanen et al. 2010) and methods of applied theatre (see Pässilä and Oikarinen 2008a; 2008b). These tools are based on the innovation potential in weak ties or structural holes in the network; where differences and distances to existing structures may act as a platform for innovation.

This study has tackled the complicit nature of change applied in the context of ageing. To conclude: the answer to why the change is so difficult, stems from the co-evolutionary and co-effective relationships between landscape changes, changes in the local and regime-level practices and rule systems, which is a very complex and multi-level dynamical socio-technical phenomenon. The findings of this study indicate that transition takes place:

- in dynamic interaction between levels, but not in a functionalistic way, but as a result of purposive action and governance to some extent. Breaking the inertia and using the window of opportunity offered by dynamics between levels, presupposes the actors’ special capabilities and actions such as dynamic capabilities and distance management.
- in the socio-technological negotiations inside the regime: interaction between technological and social, which is embodied in the use of technology. The use of technology includes small-level contextual scripts that also participate in forming broader societal scripts (for instance defining old age at the society level), which in their turn affect the formation of policies for innovation and ageing.
- by the means of active formation of the multi-actor innovation networks, where the role of distance management is crucial to facilitate the communication between actors coming from different backgrounds as well as to help the niches born outside the regime to utilise the window of opportunity offered by regime destabilisation.

11 DISCUSSION: TOWARDS A TRANSITION IN THE FIELD OF AGEING?

There are clear changes going on in the landscape, and I argue that this resulted in a certain destabilisation of the existing regime of ageing, which is seen as contradictory demands, and opposing directions in the subsystems of the regime. It can be noted that landscape changes have exerted pressures, for instance, on the welfare state as a stable rule system. The main change is that the regime of ageing is no longer inside the social and health care system, but there is an ongoing disengagement of this tradition, as there has been discussion about ageing touching all society. A sign of destabilisation is also seeing ageing and innovation activities as

more multi-sided phenomena. Even though many of the estimations argue that even though the ageing phenomenon will cause many problems there are also arguments that the threats of ageing are greatly exaggerated (Kiander 2009), and the ageing is also seen as a positive phenomenon. As Jyrkämä et al. (2009, 165) argue in the post-industrialised society old age is "on motion". The destabilisation of the regime is seen, for example, in the polarisations in the public discussion concerning the question of ageing, for instance, responsibility of individual/responsibility of society, customer/ citizen, those in good health/those in poor health, productivity/quality, activating/disengaging, high-quality technology/old-fashioned practices, prevention/cure etc. These opposing appreciations, images of ageing and focuses are tearing the regime in opposite directions.

As noted, the changing concepts of innovation have their role in the change in the regime of ageing. Innovation policies and funding structures in Finland have begun to direct their actions at innovation activities in the public sector, such as the development of the organisational structures in the public health care to increase the productivity of the public sector. On the other hand, economic pressures would motivate the development of technologies with the aim of replacing the workforce with technology in care work. However, the social and cultural attitudes and appreciations often go into opposing directions, and there is public debate about the importance of an adequate number of employees in the elderly care. This would mean that the inner processes in the regime are not aligned, and there are continuous negotiations going on.

These mismatches inside the elderly care regime are seen, for instance, in the way that service providing does not always respond to the users' preferences. The study of safety alarms showed, for example, that the customers would appreciate more individually profiled service, most of the calls deal with something other than an emergency (which is the 'official line' in most of the service providers); there are social needs and needs concerning everyday activities. However, as noted, these anomalies and niche-uses, as mismatches between the actual user practices and existing systems, can act as seeds for change.

On the other hand, even though the ageing of the population exerts quite strong pressure, and there are also radical novelties, in the field of technology, like robotics in the elderly care, these have not had a great breakthrough, because they do not seem to have a place in the prevailing conceptions and socio-cultural atmosphere of elderly care. There is also an ethical debate related to increased supervision and monitoring technology. Ethical dilemmas are seen, for instance, when willing to offer as safe an environment as possible for the person (*doing good*), but because of that we often restrict their actions and use intrusive methods at the expense of privacy and autonomy (*avoiding harm*) (e.g. Topo 2007; 2009). As technologies are embedded in production practices and routines, consumption patterns, engineering and management belief systems and cultural values, this embedding creates economic, technological, cognitive and social barriers for new technologies (Kemp et al. 1998). In these cases, the challenges for distance management are great, as cultural values are hard to change. In Finland there is quite a long history of the welfare state and the appreciation of patient care that is contrary to the new structures and technologies.

Kivisaari and Saranummi, who have studied the regime change in social and health care in Finland, have described the situation in social and health care as a transformation of the existing system. In their view, the question is not about transition, because the pressures are

coming from outside the regime, but the change is performed by incumbent actors. (Kivisaari and Saranummi 2008.) On the typology of transition pathways (Geels and Schot 2007), in a transformation path there is moderate landscape pressure on the regime, at the moment when niche innovations have not yet been sufficiently developed, and regime actors will respond by modifying the direction of development paths and innovation activities. Kivisaari and Saranummi argue that even though the change is encouraged at the policy level, and promising niches have been started, the diffusion of the niches has been slow. The radical novelties have not intruded into the regime level to make a change that could be termed transition, a radical renewal of the social and health care sector. (Kivisaari and Saranummi 2008). Because of the quite stable status and a long tradition of keeping the public and private sectors apart, certain belief systems are embedded, but through helping the fresh novelties to break the regime-level it is possible that they could be broken. Related to this, on the basis of this study, I would stress that *radicality* is not necessarily the only fundamental element in the transition process, as very incremental changes in the socio-technical relationships, mutually intertwined can be proved to have radical effects in the long run.

I argue that there seems to be a chance of transition in the regime of ageing, if the niche novelties, having sufficient distance to the existing regime, were exploited and the collisions in them facilitated to exploit the open windows of opportunity. This would also mean the disengagement of the regime of ageing from the regime of social and health care. Transition as a systemic innovation means changes in existing sectors and structures of society. It includes changes in the relationships with public and private sectors, as well as between sectors in the public sector. The question of ageing and possible problems in it is not solved by incremental changes in technology, service processes and structures, but by systemic change, which includes technology, societal and cultural appreciations, structures, processes, markets, policies etc.

The nature of the phenomenon of ageing has been written on since the days of St. Augustine, Cicero and Galen (about 134–200 AD). The crucial theme of pondering has been if ageing should be understood as a natural, inevent process or should it or at least its consequences be treated as pathological phenomena which should be slowed down and treated. (Jylhä 2003.) This discussion still goes on, and the emphasises have been varying during history. Last decades have been characterised by medicalisation of the old age (Zola 1972; see e.g. Rintala 1999; Jylhä 2003). Also according to Vaarama (2009), the current age-political atmosphere is labeled by medicalisation, commercialisation, privatisation and rationalisation of old age, where the elderly are mainly seen as a burden to the society. Thus it can be said that the regime of ageing has been located inside the social and health care sector and mainly meant the fields of elderly care and medicine. However, the concepts of active and productive ageing are increasing and thus changing our attitude towards ageing more positive, which actually has some echoes from the agricultural society. There old age was not a separate phase of life: activity was kept up by physical work, making retirement an unknown concept. The ageing of the population is shifting the socio-political interest in an individual level phenomenon to the society level, i.e. how the society by its own standards builds the notion of ageing, and how the elderly on their part build the society by their own choices and behavior. (Vaarama 2009).

As noted, the transitions take place over a long period, the regime shift can take decades, and it is, of course, difficult to predict the direction of change: for example, which type of

perception of ageing the future structures of society are based on, or if they are influenced by some other emerging megatrend and/or breakthrough of an extremely radical niche-innovation; something completely different. With regard to the increasing heterogeneity of the elderly, the trend seems to be that the many faces of ageing are to be taken into account in ageing policies and societal structures. On the other hand, the heterogeneity may also lead to redefinitions of old age and ageing, which also may have its structural influences.

12 REFLECTION OF THE STUDY AND SUGGESTIONS FOR FURTHER RESEARCH

The research task has been extremely inspiring but also very challenging because the topic has been a macro-level societal phenomenon that could be approached from numerous directions. This study does not certainly examine every aspect of the dynamics of the phenomenon of ageing, but I would say that the strength of this dissertation is in the novel way of analysing a macro-level phenomenon through micro-level case studies. In other words, ageing at the societal level is not changing just because of demographic changes or just because the policies are changing. The change of policies and societal perceptions can be reduced, for instance, to the technical properties of the safety alarm systems or speeches of the safety alarm users in the long run, which, in their part, are constituted within macro-level structures. To show the importance of small, everyday things, that could be affected to, as part of the dynamics of ageing, increases the practical importance of this dissertation. Even though this summarizing article includes rather far-reaching conclusions and interpretations on the basis of the original articles and the data used in them, the reliability of this research has been increased by making the chains of reasoning and the principles of classifications as visible as possible, both in this summarizing article as well as in the original articles with empirical data. The data used in the articles was quite broad, and in the cases of interviews it showed signs of saturation. Also when studying this dissertation as an entity, the data used is very broad in nature and covers many subjects and ways of collection, as well as analysis methods. In other words, the different forms of triangulation: data triangulation, investigator triangulation, theoretical triangulation and methodological triangulation (see Denzin 1970), have been used in this dissertation. Likewise, when regarding the cases presented in the articles, the data was often collected through several ways (for instance both interviews and surveys), to ensure the validity of the dissertation.

The data was collected during a quite long period in various research and development projects and under certain “production conditions”, dependent on the aims of the project in question. However, the scientific aims and principles have been kept in mind during data collection. On the other hand, the data collected in this way has also enhanced the practical and contextual understanding of the phenomenon in question. Regime changes are long term processes, lasting for decades, and few years of data collection is not actually a very long time, but has nonetheless offered some sort of micro-historical perspective.

As a critical reflection of this dissertation some points should be noted. First, I would like to note that during the research, I noted that it was quite difficult to “catch” the phenomenon of

ageing as a regime, because the elements of it currently seem to be quite shaky and in motion. An easier way of applying the multi-level perspective would have been a retrospective analysis of the history of ageing, following Geels, who has done mainly historical studies, but he has also been criticised because of that, because it is possible to choose only the “winning technologies” (see e.g. Genus and Coles 2008). On the other hand, it has been very inspiring to study the phenomenon that is actually going on and in the “shaky phase”, and the direction of which is still uncertain.

One limitation of the study is related to the notion that even though this dissertation contributes to understanding the phenomenon of ageing as a transition, the transition is very complex consisting of many things. The substudies as case studies cover only parts of this transition, but there are a great number of other elements in the transition process that could be empirically and systematically studied, like the process of building ageing policies, or interlinks between regime of ageing and other regimes.

Another limitation is that from the point of view of innovation, the study lacks the examination of the “core” of the innovation, the development of the actual (niche) innovation. The study covers the topics of building innovation networks as well as usage of and embedding innovations, but lacks the part of the dynamics of creating an innovation, which could also be included in the study of transitions. This could also be a part where the action-network theory could be included in the study of transitions, which is also suggested by Genus and Coles (2008).

The aforementioned special characteristics and shortcomings could be taken into account in possible future studies, and there are also other potential interesting future research topics connected to this study to increase understanding about the transition in the field of ageing. A very interesting research topic would be the study of the interlinks between the regime of ageing and other regimes. It would also be interesting to put more emphasis on the connections between ageing and policy level, for example, innovation policies, which is maybe at the core of the societal rule system and plays a role in steering the allocation of resources, which in their turn, crucially affect the direction of change.

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APPENDIX 1. CENTRAL CONCEPTS AND DEFINITIONS

Age act: One of the frequent ways to produce the cultural meanings of the old age. Age acts are every-day actions taken in social interaction, actions producing one's own or other people's social age, or actions defining oneself or others within the category of the elderly (Vakimo 2001).

Age speech: Speech producing and reflecting social perceptions of old age. (Vakimo 2001)

Distance management: Stresses the potential of distances (differences) in change and their governance. The distances may be located within one level or between levels in the multi-level perspective, and may act as barriers for change, but when governed, may turn to change and innovation. Distance management is close to the concepts of strategic niche management and transition management.

Dynamic capabilities: Originally defined as the processes within an organization that use resources, especially processes that integrate, reconfigure, gain and release resources to match, and even create, market change. (Teece et al. 2007, Eisenhardt and Martin 2000). In the regional context, they mean the ability to generate development paths in a turbulent environment with the aim of reforming resource configurations based on the history of the region and opportunities emerging from the techno-socio-economic development. Dynamic capabilities play an important role in solving lock-ins and reducing socio-institutional inertia. In this study, the concept of dynamic capabilities is suggested to be applicable in the regime changes, helping the actors of the regime to adapt to the landscape pressures.

Gerontechnology: A composite of two words, gerontology (the scientific study of ageing and research) and technology (the development and design of new and improved techniques, products and services). Gerontechnology refers to technology that fulfils the needs of an ageing society, and also to the interdisciplinary study of technology and ageing for ensuring good health, full social participation and independent living throughout life. (Harrington and Harrington 2000)

Inertia: Forces which make the socio-institutional framework resistant to change and rather slow to adapt to new conditions, except under critical pressure (Perez 2004). Inertia arises, for example, from sticking to a prevailing operational model characterized by routines and stable social relationships.

Innovation: New idea or invention that is implemented and has a value aspect. Traditionally the value has meant market value, but according to the broad understanding of innovation, the value aspect can also be defined as social or human value, which makes it possible to talk for instance about social innovations.

Innovation of ageing: Innovation and innovation activity that are linked to ageing at individual or societal level. Innovations of ageing may be any types of innovations: i.e. product, service, social, organizational innovations, and combinations of these. Innovations of ageing fundamentally include social aspects (for example, related to values, acceptance, social

relations) standing by the technological aspects. They are a multi-sectoral phenomenon, combining different kind of knowledge, for instance, gerontology, marketing, process development, manufacturing, communication, information technology etc.

Innovativeness: Describes the potential to produce innovations. Innovativeness is more a feature of what happens in the process on the way to innovations than the end product (Paalanen et al. 2009).

Multi-level perspective: Describes transitions from one socio-technical regime to another. The multi-level perspective argues that societal transitions come about through interactions between processes at three levels: niche-innovations build up internal momentum, changes at the landscape level exert pressure on the regime, and destabilisation of the regime creates windows of opportunity for niche-innovations. Interactions between these levels lead to societal transition. (e.g. Geels 2002.)

Niche-innovations: The micro-level of the multi-level perspective, where radical novelties emerge. Experimental niche-innovations are carried out and developed by small networks of dedicated actors, often outside or on the fringe of the existing regime, and have no connection to stable rules. Niches may act as spaces for experimentation protected from market selection pressures, or they may enable social networks supporting radical innovations to be built up. They may act as seeds for change in times of regime destabilisation.

Scripts: Property of technical objects defining a framework of action (including ethical issues, rights and obligations) together with the actors and the space in which they are supposed to act: the physical properties of artefacts often tell us the way we should behave. (Akrich 1992.)

Socio-technical landscape: Macro-level of the multi-level perspective, which forms an exogenous environment including, for example, macro-economics, deep cultural patterns and macro-political developments.

Socio-technical regime: The meso-level of the multi-level perspective, refers to the rule-systems that guide and orient activities of social groups, including scientists, users, policy makers and societal groups, that interact and form networks with mutual dependencies. (Kemp et al. 1998; Geels 2005; Geels and Kemp 2007, 442). Socio-technical regimes account for the stability of existing socio-technical systems. Besides the markets, user preferences, scientific understanding, it includes political and cultural atmosphere as well as technology and infrastructure.

Socio-technical system: The entity of elements (material aspects, embedded actors and organisational networks, and the rules and regimes) taking part in producing a societal function (e.g. elderly care). Social and technical aspects are strongly interlinked here.

Social ageing: Refers to age norms and to appropriate attitudes and behaviour connected to a certain age, subjective perspectives and ascribed age (Ginn and Arber 1995; Jyrkämä 2001) Social ageing deals with the relationship between a person and the environment, and defines for example, who is old and which factors affect the definition of old age. (Tikka 1994).

Strategic niche management: Strategic niche management is the creation and management of niches for promising technologies. It means the creation of protected spaces for the development and use of promising technologies by means of experimentation. It also means making institutional connections and adaptations between companies, researchers and public authorities. (Schot et al. 2004; Kemp et al. 1998)

Transition: Refers to a shift of some socio-technical system from one regime to a new regime. This is a result of long-term interactions between dynamics at landscape, regime and niche levels. A transition involves changes in technologies, knowledge-base, infrastructure, rules and regulations, user practices and cultural preferences. (e.g. Geels 2002.)

Transition management: Transition management refers to an attempt to redirect the existing dynamics of technological change towards societal goals. Transition management means long-term policy design both with top-down and with bottom-up processes. A particular feature is the interconnectedness of technological and social systems, including governance models and institutions. (Heiskanen et al. 2009).

PART II: PUBLICATIONS

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The Role of Dynamic Capabilities and Social Capital in Breaking Socio-Institutional Inertia in Regional Development

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Abstract

A shift in the techno-economic paradigm will affect regions; regions, however, are path-dependent units. This path-dependency often leads to considerable socio-institutional inertia in the process of transformation whereby regions aim to remain competitive in the face of worldwide competition. The present article assesses the role of the dynamic capabilities of social capital in the process of regional adaptation. A survey conducted in the Lahti urban region in Finland is used as empirical data. The results of the survey reveal the respondents' fairly good awareness of the prevailing techno-economic paradigm and of the strong socio-institutional inertia confronting change in practice. The results suggest, however, that there are systematic differences in responsiveness between local politicians and other decision-makers. The study concludes with a discussion of the relevance of shared common views on the development needed within the region.

Introduction

During certain cycles, the world economy encounters shifts in the techno-economic paradigm caused by leaps in technological development. During the last century, the world lived through the change from the agricultural era to the industrial era. Nowadays, the world is changing from the industrial era to the information era. A number of theories have been developed to understand the regional adjustment processes that take place when the paradigm shifts. For example, the theories of evolutionary and institutional economics (see e.g. Boschma, 2004), of clusters (see e.g. Porter, 1998) and industrial districts (see e.g. Piore and Sabel, 1984), and of innovation systems (see e.g. Nelson, 1993), as well as the resource-based view of regional strategies (see e.g. Harmaakorpi, 2006), provide different views of the adjustment process that takes place in the regions. These theories emphasize the incremental evolution and development of regional institutions, systems and economic structure as the driving forces of the change.

The regions' success is strongly affected by their adaptability to the emerging techno-economic environment. This adaptability depends strongly on their existing resources and their capabilities for renewing these resources. Therefore, this article starts out from the resource-based view of regional development, where regional competitive advantage is seen to derive from unique resource configurations. These configurations must, however, be renewed over time in order to keep them competitive. The framework of

dynamic capabilities (see e.g. Teece *et al.*, 1997; Eisenhardt and Martin, 2000) focuses on the processes intended to bring about this renewal. Dynamic capabilities also play an important role in avoiding lock-ins and resource rigidities. These particular sources of socio-institutional inertia arise from the path-dependent nature of regional resources. Path-dependency is, in turn, a result of the fact that regional resources are gained through historical development. Therefore, path-dependency must be considered one of the basic elements in regional development and as one of the main factors causing inertia (Maskell and Malmberg, 1999; Harmaakorpi, 2004: 108).

This article argues that renewing the 'social resource configurations' is important in trying to avoid or mitigate socio-institutional inertia within regional development networks. The resource-based view of social capital (see Tura and Harmaakorpi, 2005) assesses the necessary attitudes and abilities enabling dynamic capabilities in regional development through the lens of social capital. The level and nature of regional social capital in regional networks can both promote or prevent necessary regional change.

Objectives of the study

In this study we seek to illustrate the challenge a region faces in its development work. Like any network organization, a region is a setting where many opinions and contrasting ideologies are held. The objective of this article is twofold. First, we attempt to describe the role of dynamic capabilities and social capital as vehicles for mobilizing a stagnant region to development work. Second, we analyse the regional actors' level of understanding on the prevailing state of affairs in the region and the development issues the region is facing.

Research methods and materials

The study presents an analysis of a survey targeted at the key local people taking part in the decision-making processes that affect regional development work. Although the focus of interest in the study is the qualitative differences between different opinions, the quantitative method was chosen to provide a wider picture of the regional decision-making system. The sample survey used for this purpose produced 155 responses, equivalent to a response rate of 43%. In the survey, actors in the regional development network were asked to rate the importance of certain issues for regional development in general, and, on the other hand, the extent to which these issues were realized in the prevailing development environment. After studying the respondents' views on the present state of development and the development steps needed, we conduct a factor analysis of the present state views. Finally, we compare the factors that emerge to the background measures of the respondents.

Social capital as a regional resource

One way to understand the cornerstones of competitiveness is to apply the resource-based approach (Penrose, 1959; Wernerfelt, 1984). The resource-based approach assumes that economic actors can be conceptualized as sets of resources and capabilities, and that resource differences persist over time (Mahoney and Pandian, 1992; Amit and Schoemaker, 1993). Should economic actors have resources that are valuable, rare and inimitable, they can achieve a competitive advantage by implementing value-creating strategies. The sustainability of the competitive advantage arises from a configuration of resources and capabilities that are difficult for other actors to duplicate (Wernerfelt, 1984; 1995; Barney, 1991; Nelson, 1991; Peteraf, 1993; Conner and Prahalad, 1996).

The resource-based view can also be applied in a regional context (see e.g. Porter, 1990). Over the years, the regions have created a resource base intended to provide them with competitive advantages against other regions. Regional resource configurations include combinations of natural, physical, social, cultural and intellectual resources, for example. Natural and physical resources are still important, but their relative importance in building regional competitive advantage is constantly diminishing.

Dynamic capabilities form an essential part of the resource-based view. Nevertheless the strength of the resource base, the resource configuration, needs to be renewed continuously. The framework of dynamic capabilities (see Teece *et al.*, 1997) offers a fair basis for assessing the capabilities needed in the transformation of an actor. Dynamic capabilities can be defined as the processes within an organization that use resources, especially processes that integrate, reconfigure, gain and release resources to match, and even create, market change. Dynamic capabilities, thus, are the organizational and strategic routines by which actors achieve new resource configurations as markets emerge, collide, split, evolve and die (Eisenhardt and Martin, 2000: 1107). In fact, dynamic capabilities relate to an actor's ability to innovate, since 'the production and use of knowledge is at the core of value-added activities, and innovation is at the core of firms' and nations' strategies for growth' (Archibugi and Michie, 1995: 1). By renewing and helping to exploit regional resources, dynamic capabilities also play an important role in solving regional lock-ins and reducing socio-institutional inertia. Inertia arises, for example, from sticking to a declining industry or to a prevailing operational model characterized by routines and stable social relationships.

Unlike the bulk of resources, dynamic capabilities are not idiosyncratic in nature and therefore there are best practices in dynamic capabilities that should be relatively easy to imitate (Eisenhardt and Martin, 2000). It is evident, however, that there are notably idiosyncratic features in dynamic capabilities at the regional level. This conclusion is supported by the quite different success trajectories among regions with seemingly similar resource bases (see Harmaakorpi, 2004).

Resource configurations can be varied and can include rather abstract elements. One of the most important resources is social capital. According to Putnam, social capital 'refers to features of social organization, such as trust, norms and networks that can improve the efficiency of society by facilitating co-ordinated actions' (Putnam, 1993: 167). In general, social capital refers to the possession of social relationships and membership in collectives, and to the resources that derive from these.

Tura and Harmaakorpi (2005) present the resource-based view of social capital: they consider social capital to refer to that portion of an actor's resources, that is located in the actor's social relationships (Tura and Harmaakorpi, 2005: 1116–7).¹ The resources that make up social capital enable certain actions or make certain objectives obtainable that would have been impossible or unattainable without them (*cf.* Nahapiet and Ghoshal, 1998: 244). This view comes close to Lin's (2001: 29) definition of social capital as 'resources embedded in a social structure that are accessed and/or mobilized in purposive actions'. This means that social capital is a capability-like resource: it is closely connected to the things we *can do*, while, for example, physical capital is more about things we *have*. It is also dispositional: it can exist even if it is not exercised, or even recognized, at a given moment.

In Tura and Harmaakorpi's view, social capital is connected to an actor's capacity for action and possibilities of action. The capacity for action of an individual or collective actor consists of different resources that the actor utilizes and applies to his or her actions. One group of these resources is the actor's position and relationships within social structures and networks: his or her social status, the kind of friendships that he or she has, and the kind of cultural and value-based communities to which he or she belongs. Tura and Harmaakorpi (2005) call this combination of the actor's social resources his or her social capital. Through social capital an actor has the capacity to

1 An actor can here be collective as well as individual.

mobilize other actors and their resources. Defined in this way social capital is strongly connected to action. It is 'material' an actor may use in his or her action. At the same time, it can limit some other action and possibilities.

The role of social capital in regional development seems to be two-edged. On the one hand, it has been said to have a positive effect on regional development and renewal processes, the key elements for socio-institutional adaptation. On the other, Florida *et al.* (2002), for example, argue that places with high social capital are the worst places for innovation and creative processes. Likewise, Frombold-Eisebith (2002: 8) considers social capital and innovative milieu to be opposing concepts: she states that the general purpose of social capital is 'to sustain elements of stability and reliability in an environment of change'.

The form of social capital needed in the regional development environment is best described as 'creative social capital'. In the regional development networks this is a field-specific resource. It includes the elements of creative tension (Sotarauta and Lakso, 2000) and it supports the necessary socio-institutional change caused by techno-economic development. It is also a balanced amalgam of bridging and bonding social capital (see Putnam, 2000: 22–4). Bridging social capital creates bonds of connectedness formed across diverse horizontal groups, whereas bonding social capital connects only the members of homogenous groups (Granovetter, 1985; Putnam, 2000). Tura and Harmaakorpi (2005: 1121) argue that if there is only bonding social capital in the network, this may lead to unwanted results because of a decrease in absorptive capability. Such social capital can lead to a closure of the network and collective blindness. (Closure, in Tura and Harmaakorpi's terms, refers to the way a network separates itself from its environment: the members have close relationships within the network, but only a few or loose relationships with the actors outside the network. Collective blindness, on the other hand, refers to the way a network may collectively focus on the wrong things.)

When moving from the individual level to the innovative capability of a community, an organization or a network, the role of social capital changes significantly. It is not only one resource among others, but is also located at the centre of the whole innovative capability. Social capital is a resource which gives an organization or network the capacity to utilize the material, economic and intellectual resources of the whole collective, as well as social resources reaching outside the collective (Tura and Harmaakorpi, 2005: 1119).

The role of dynamic capabilities in renewing the regional resource base

At the regional level, dynamic capabilities are defined as the region's ability to generate competitive development paths in a turbulent environment. Dynamic capabilities aim to reform regional resource configurations based on the history of the region and opportunities emerging from the techno-socio-economic development (Harmaakorpi, 2004: 110).

Networking capability

Castells (1996) has formulated a systemic theory of the information era that takes into account the fundamental effects information technologies have on the contemporary world. He is interested in the emergence of a new social structure, which he labels a network society. The main logic of the ongoing development in the information era, both in a space of flows and in a space of places, is the logic of networking. In the network-based society, the coordination of social actions increasingly takes place in networks. Being a successful part of worldwide networks becomes an essential success factor in the network-based society. Accordingly, it is important to be able to develop a creative

networked-based regional development environment in order to increase regional competitiveness in international competition.

A network-based organization can be an internally network-based organization such as a decentralized organization, or it can be formed from independent organizations connected by means of partnerships. In the case of a regional development environment, the importance of organizations of the latter type is emphasized. In a network-based organization, each actor has its own role and functions: the actors are specialized, also at the international level. As Sotarauta (1999: 104–5) suggests, network actors can have different motives for their cooperation. A network can be seen, for example, as a channel, as a way to minimize expenses or as a strategic tool. Interaction and cooperation are expected to be rich. In this context, the critical question is how is it possible to create a trusting atmosphere in these networks in order to achieve positive externalities in the interactive and joint development processes. Planned cooperation can take place in setting objectives, forming strategies, producing products and serving customers.

Networking capability connected with social capital seems vital for regional development. Its importance arises from its capacity to break possible lock-ins and reduce the socio-institutional inertia that has developed because of too much bonding social capital, for example. Regional networking capability can be defined as a regional development network's ability to build interactive networks including field-specific creative social capital leading to effective utilization of the resource configurations in the networks (Harmaakorpi, 2004: 112). Networking capability helps regional actors increase interaction and cooperation and build trustful relationships and a sense of communality, as well as helping individual actors specialize and choose external partners also at the international level.

Leadership capability

Network leadership is growing in importance within regional innovation systems. Network leadership could be defined as action that leads all the operations and resources of the network in the desired direction. Borja and Castells (1997) have reflected on the factors involved in creating a successful regional network. They identify leadership as one of these factors, suggesting that leadership refers to the ability to organize complex projects, to manage conflicts and anomalies, as well as to process and disseminate information worldwide. Stewart (1986) describes leadership in regional development in terms such as information management, choice, flexibility, responsibility and politics. Traditional management can be described using such words as control, standard, stability, parallel, profession and task. The new leadership tries to create a learning and innovative economy in the region and includes an active interpretation of signals for change.

Sotarauta (1999: 30) identifies the essential characteristics of leadership in a regional development environment. According to him, leadership acts as a mediator in interaction between different actors. In addition, network leadership directs activities to seek out common goals. Essential features for network leadership are negotiation, communication, persuasion, trade and visionary skills (*ibid.*: 110). The communicative strategy of a multi-actor and multi-goal environment needs creative and goal-seeking leadership.

Traditional management emphasizing common visions and strategies does not fit very well with network-based regional development (Linnamaa, 1999). Traditional management does not take the split power and learning in a loose network sufficiently into account. In regional development, leadership deals with many goals and strategies. Actors in the regional innovation system take part in several kinds of network. These can be very different in nature. This requires different capabilities from actors coming from different backgrounds.

The role of leadership capability becomes decisive especially when preventing lock-ins and trying to find new paths out of lock-in situations. (Kotter, 1988; Sotarauta, 1999.) Leadership capability in a networked regional development environment can be defined as the ability, within that environment, to effectuate actions that steer the processes and resources of the system in the desired direction and avoid harmful lock-ins. Regional leadership capability is needed to create a good conversation culture, to combine different opinions, to achieve common decisions and to ensure that people stick to the joint decisions.

Visionary capability

Sensing changes in the environment presupposes the ability to make use of future-oriented knowledge. The surrounding environment continually gives weak and strong signals of future development trajectories. The need to outline potential futures has increased in recent decades, since the regions have changed from being objects of state-led regional policies to the subjects of competitiveness policies. As a result, the regions' own role and responsibility have increased. In the new multi-level governance structure, the regions meet a new kind of process and programme-based environment (Vartiainen, 1998; Sotarauta and Mustikkamäki, 2001), where they are expected to take initiatives to build successful development trajectories. There is a need for new visionary thinking.

In the process of conceptualizing the future, the public's (or consumers') role is also about to change. Instead of the role of the 'old passive subservient', the public is an active customer of the regional facilities. This places new demands, for example, on public and semi-public services: culture, health care, day care, etc. Regional public service consumers make choices like any other consumers and their strong and weak signals should guide the development work of the regional services. For a short time they may even be satisfied with a lower level of services, but in the long run low levels of service could be dangerous for regional development. When talking about consumption, there is an increasing temptation to consider things like regional brand and regional image. In many cases, it is suggested that fulfilling the needs of regional public service consumers leads to higher regional brands. A good regional brand, again, increases the chances of attracting experts and knowledge-intensive firms, enabling regional economic growth.

Closely related to regional visionary thinking is regional innovativeness. The new future trajectories need to be innovative in order to sustain the competitive advantage of the region. However, innovation in the information era is rather different from innovation in the industrial era. Nowadays, innovation is considered to be most often a result of cooperation in normal social and economic activities. Consequently, innovations are made in networks where actors from different backgrounds are involved in creating a new demand for innovativeness. Here the science push effect as the driving force of innovations is the exception rather than the rule. Instead, the drivers of innovation are likely to include the ability to interact and build trust relationships between the innovating partners. Innovativeness mostly depends on the innovation network's ability to interact rather than on an individual actor's progress in a particular scientific field.

Thus, the regions need a special dynamic capability: visionary capability. In this context visionary capability refers to an actor's ability to outline the possible potential development trajectories based on paths travelled and utilizing the opportunities emerging as the techno-economic paradigm changes (Uotila *et al.*, 2006: 3). One must be able to make use of future-oriented knowledge and take advantage of future opportunities. Visionary capability should make it possible to enhance regional visionary thinking, understand the needs of customers and promote regional initiative activities and a different kind of innovativeness in the networked regional development networks.

The empirical study

In this study we analyse the dynamic capabilities and social capital of a specific region that could be regarded as subject to major political lock-ins and socio-institutional inertia.

The Lahti region is situated in Southern Finland, about 100 kilometres from Helsinki. It comprises twelve municipalities, and has about 200,000 inhabitants, equivalent to 4% of the Finnish population. Its geographical and functional centre is the city of Lahti, which has about 98,000 inhabitants, making it the seventh largest city in Finland. Among the municipalities in the region, the differences — in surface area, population density, and industrial structure, for example — are considerable. The population and industries, especially manufacturing, are concentrated around the cities of Lahti and Heinola. The rest of the region is characteristically rural and sparsely populated.

The Lahti region has shown considerable growth in its history but recently it has been rather stagnant. Its population region doubled from 1940 to 1975, but it was strongly affected by the collapse of the Soviet Union and the deep economic recession in Finland in the early 1990s. In 1990, there were 90,370 jobs in the region. The number of jobs dropped over the next couple of years, so that in 1993 there were fewer than 70,000. Since then the number of jobs has slowly increased, and there were about 81,000 jobs in 2004. The Lahti region population slowly decreased from 1992 to 1999, but began to increase again in 2000.

With a relatively high unemployment rate and the status of a declined industrial area, the Lahti region is one of the European Union Structural Funds Objective Two regions. Among its main problems are the low number of highly educated people and an exceptionally low level of research and development spending. In 2005, the research and development expenditure in the region was about 258 euros per capita, while the average for Finland was about 1,040 euros. Furthermore, the gap between the different regions in the country is growing constantly. It seems that the region is unable to compete with other regions, at least with traditional methods of innovation.

Research setting

The study presents an analysis of a survey targeted at the key local people taking part in the decision-making processes of regional development work. In particular the study seeks to increase the level of understanding of the reigning techno-economic paradigm and evaluate the way in which the demands of the new techno-economic paradigm have been adopted in the Lahti Region.

The research setting is based on the bidirectional relationship between dynamic capabilities and resource configurations (see Figure 1). With the help of dynamic capabilities the regional resources are renewed, and new resources can also be created. The resources act like fuel or construction material for regional development work that is exploited with the apparatus of dynamic capabilities. The value of dynamic capabilities for competitive advantage lies in their ability to alter the resource base: create, integrate, recombine and release resources (Eisenhardt and Martin, 2000: 1116). Long-term sustainable competitiveness is, therefore, said to lie in resource configurations built using dynamic capabilities, not in the capabilities themselves (*ibid.*: 1117) Three types of dynamic capability were identified as important in maintaining the competitiveness of the regions in the changing environment: leadership capability, visionary capability and networking capability.

Although the study is focused on qualitative differences between different opinions, the quantitative method was chosen to provide a wider picture of the regional decision-making system. Whilst qualitative analysis would be able to provide in-depth evidence regarding the specific complexities of regional development, the quantitative survey is an effective tool for describing current issues, comparing respondents' views in a wider context and, finally, identifying relevant empirical groups for further analyses.

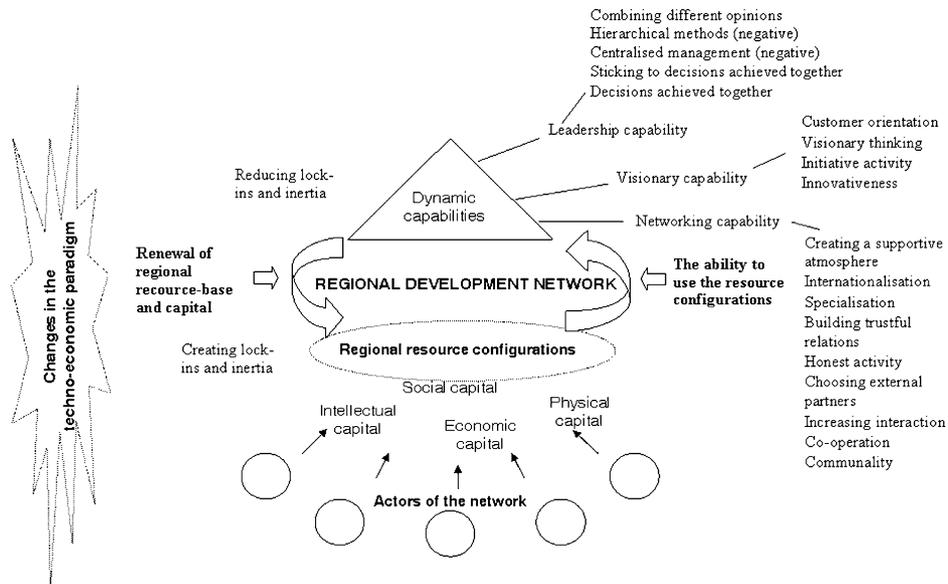


Figure 1 Framework for the study: bidirectional relationship between dynamic capabilities and regional resource configurations in reacting to the changes in the techno-economic paradigm

Based on the theoretical analysis in this study, a tool for measuring regional capabilities of adaptation was formed for the following analysis. The attitudes to these variables can be seen to reflect the atmosphere in which the development process takes place in a region. In this study the following variables are used to describe the three dynamic capabilities needed in the regional development:

Visionary capability

- initiative activity
- visionary thinking
- innovativeness
- customer orientation

Leadership capability

- combining different opinions
- hierarchical methods (- negative)
- centralized management (- negative)
- sticking to decisions achieved together
- decisions achieved together

Networking capability

- choosing external partners
- building trust relationships
- increasing interaction
- creating a supportive atmosphere
- internationalization
- specialization
- cooperation
- communality
- honest activity

Table 1 Background characteristics of the respondents

	No.	%
Total	155	100
<i>Position</i>		
1 Development, research or education	42	27
2 Politician	72	47
3 Company representative	19	12
4 No data available	22	14
<i>Municipality</i>		
1 Metropolis Lahti	70	45
2 Second chain Hollola and Nastola	30	19
3 Others	35	23
4 No data available	20	13

A questionnaire measuring overall attitudes, opinions and ideas concerning the new regional development environment was drafted. The questionnaire was sent to 360 actors in the Lahti region, 155 of whom responded. The response rate was 43%, which might be considered satisfactory.

Table 1 presents the respondents' characteristics. The respondents were decision-makers and developers from different public and private organizations, as well as politicians, in the Lahti region. Roughly half of the response consists of politicians, that is, members of the local municipality councils. The local authorities, development agencies and research organizations were represented by 42 respondents or 27% of the response. The response also included 19 top managers from the major local private companies. Their participation in the sample is of primary importance as they are actively participating in local business development through various development projects and as customers of the public development organizations. Finally, 22 respondents failed to indicate any specific role they play in the local development arena.

Analysis

In the survey, the main interest focused on the decision-makers' perceptions of regional development. The respondents were asked to rate the importance of the issues for regional development in general. The results in Table 2 show that the respondents consider honest activity, joint decisions and creating a supportive atmosphere as the most relevant issues to follow in the regional development work. Together these issues reflect the importance of social capital and network leadership as beneficial characteristics of the individual developers and development organizations in the region. On the other hand, hierarchical methods, centralized management, combining of different opinions and communality rated lowest in the analysis.

In general, the analysis above suggests a rather wide array of development measures are considered favourable for regional development work. Altogether 11 items received a value higher than 1.40 and only a few measures are clearly identified as unfavourable. This could mean two things: either those measures can all be useful in development work or the respondents do not recognize the semantic differences between the measures. However, since the respondents represent a sample of the main decision-makers in the region, it is likely that they are well aware of the meaning of the different development measures. In terms of socio-institutional inertia, the case seems interesting as there

Table 2 The descriptive statistics of regional development measures, range 0-2 (n 155)

	Mean	Sd.
Honest activity	1.78	.42
Joint decisions	1.70	.50
Creating a supportive atmosphere	1.69	.50
Building trustful relationships	1.61	.50
Sticking to joint decisions	1.61	.54
Innovativeness	1.55	.57
Customer orientation	1.54	.56
Cooperation	1.53	.55
Increased interaction	1.49	.53
Initiative activity	1.47	.47
Visionary thinking	1.40	.62
Specialization	1.13	.55
Internationalization	1.13	.71
Choosing external partners	1.04	.59
Communality	1.00	.67
Combining different opinions	.50	.62
Centralized management	.27	.54
Hierarchical methods	.13	.37

inevitably are a number of interchangeable development measures to be considered and that may lead to conflicting interests in the minds of the decision-makers.

In the survey, the respondents were also asked to evaluate the current situation in the local regional development work. Table 3 shows that overall the scores are relatively low. Among the items, hierarchical methods, centralized management, internationalization and honesty score highest. On the other hand, visionary thinking, building trust relationships and creating a supportive atmosphere score lowest.

The analysis shows that the differences between the measures are apparently small, with the exception of the first two measures. The high ratings for centralized management and the hierarchy suggest a fairly unanimous perception of the current state of affairs in the region. It should be borne in mind that the sample includes decision-makers in various positions of administrative power and that they also represent different municipalities in the region, both the leading municipality and the peripheral municipalities. Thus, the response could reflect some criticism against, for example, regional administrative organizations or the largest municipality in the region guiding the development. Nevertheless, the table suggests that compared to the ideal state of affairs the current situation is much worse.

To understand the relationships between the local regional development issues and to enable further analyses, a principal component analysis was conducted (see Table 4). An exploratory analysis with Varimax-rotation produced five factors, explaining the moderate 60% of the total variance.

Factor 1: The first factor accounts for 31% of the total variance of the data, with seven loadings higher than 0.40. The factor stresses the importance of making decisions and sticking to the joint decisions. The items 'creating a supportive atmosphere', 'honesty', 'creating trustful relationships', and 'increasing interaction' confirm the interpretation

Table 3 The descriptive statistics of local regional development measures, range 0-2 (n 155)

	Mean	Sd.
Hierarchical methods	1.22	.60
Centralized management	1.18	.70
Internationalization	.76	.58
Honest activity	.74	.61
Initiative activity	.66	.57
Sticking to joint decisions	.66	.60
Increasing interaction	.65	.58
Specialization	.64	.59
Open sharing of information	.61	.59
Choosing external partners	.61	.55
Combining different opinions	.57	.60
Customer orientations	.55	.59
Joint decisions achieved together	.54	.62
Cooperation	.52	.57
Communality	.51	.58
Innovativeness	.49	.56
Visionary thinking	.48	.59
Building trustful relationships	.41	.52
Creating a supportive atmosphere	.36	.58

that the factor deals with togetherness and relationships that should be valued and respected. As such the factor could be labelled *bonding social capital*.

Factor 2: The second factor represents 8.71% of the total variance, and as such it seems to form a clear pattern of regional development. The items that loaded high in the component are 'visionary thinking', 'customer orientation', 'innovativeness' and 'initiative behaviour'. These all deal with the need for creating new openings and questioning the relevance of earlier solutions. Together, these items reflect entrepreneurial and proactive behaviour in regional development work and the factor can be labelled *creative social capital*.

Factor 3: The third factor received two loadings above 0.40, capturing 7.47% of the total variance. Interestingly, 'centralized management' and 'hierarchy' loaded in the same factor, suggesting that they are, in fact, perceived as complementary. Together they reflect the idea of managing the region like a single organization, with clear chains of command and clear goals and work division. As such, the factor called *command and control society* represents a view contrary to factor 1 with the social capital tendencies.

Factor 4: In the fourth factor, only two items loaded higher than 0.40. The items 'combining different opinions' and 'communality' together reflect the willingness to reach compromises and the need to belong to a group. The relationship between this factor and the factor of bonding social capital is interesting. Even if they both seem to represent the view of the community, it seems that factor 4 is 'softer' in its meaning. Whereas the bonding social capital-factor was about making decisions and creating things, this factor does not include action *per se*, rather it seeks to take everyone's opinion into account with the risk of non-action. The factor is called *intra-regional bridging social capital*.

Table 4 The principal components analysis of the local regional development situation

	1	2	3	4	5	Comm.
Sticking to joint decisions	.78					.691
Joint decisions	.76					.632
Supportive atmosphere	.74					.641
Honest activity	.70					.600
Trustful relationships	.67					.525
Co-operation	.65					.540
Creating interaction	.62					.499
Visionary thinking		.71				.590
Customer orientation		.70				.543
Innovativeness		.66				.590
Initiative		.53				.544
Centralized management			.83			.712
Hierarchical methods			.81			.741
Different opinions				.77		.660
Communality				.73		.632
Specialization					.68	.524
Internationalization					.65	.578
External partners					.63	.532
Eigenvalue	5.59	1.57	1.35	1.21	1.07	
Percentage	31.03	8.71	7.47	6.71	5.95	
Cumulative	31.03	39.74	47.21	53.92	59.86	

KMO measure of sampling adequacy .850 (results exceeding .50 acceptable)

Factor 5: The fifth factor captured three items: specialization, internationalization and the selection of external partners. Together they reflect the need for competitiveness, recognizing the core competencies and reaching out from the region. As such, this factor is an interesting one representing the competition and cooperation between regions. The factor can be labelled *inter-regional bridging social capital*.

Finally, the factor structures received were corroborated by confirmatory analysis. The analysis suggested the reported structure to be steady and repeating. Along with the usual methodological tools of securing structural validity, the independent structures which emerged should be considered further. It seems that regional development work has strong underlying drivers reflected in the decision-makers' conceptions of the local situation. In the decision-maker's mind, the central issue is what kind of operation or investments are vested in each alternative direction of regional development. Thus, these five factors, that is, bonding social capital, creative social capital, the command and control society, inter-regional bridging social capital and intra-regional bridging social capital, could be seen as competing with each other in terms of the decision-makers' attention or ideological tendencies.

The last step in the analysis was to further study the eventual socio-institutional inertia underlying the development needs in the region. To do that, we combine the respondents' reactions to the questions on the regional development measures in general and those issues that have been used in the local regional development. As a result we received an insight into the gap between the ideal development pattern and the real state of affairs. To

Table 5 The development gap according to the type of decision-maker and the type of municipality

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Range	-.29-2.00	-.50-2.00	-2.00-2.00	-2.00-2.00	-2.00-2.00
Mean overall	1.08	.96	-.99	.37	.41
Sd.	.53	.57	.74	.75	.60
Developers (n 42)	1.13	1.07	-.99	.40	.60
Politicians (n 72)	1.03	.82	-.95	.44	.29
Business					
Managers (n 19)	1.12	1.22	-1.24	.05	.48
F-value	.472	5.129	1.148	2.032	3.818
Sign.	.625	.007	.321	.135	.025
Lahti (n 70)	1.12	1.07	-1.09	.41	.52
Hollola-Nastola (n 30)	1.17	.92	-1.06	.17	.25
Others (n 35)	.93	.73	-.74	.47	.33
F-value	2.013	4.182	2.880	1.537	2.540
Sign	.138	.017	.060	.291	.083

Two-sided ANOVA

analyse this further we formed sum measures following the factor solution presented earlier. Thus, each sum measure represents the local decision-makers' perception of the need to further develop that particular issue. In Table 5, the comparisons between the different types of decision-makers and municipalities are presented. The decision-makers are categorized into three groups: developers, politicians and business managers. These categories are based on the respondents' background organizations.

The analysis suggests that, as far as the need to create bonding social capital in the region is concerned, there are no differences between the three groups. On the other hand, there is a statistically significant difference in the creative social capital factor. The analysis indicates that both the business managers and the developers value innovativeness, visionary thinking and initiative much higher than do the politicians. This finding may be linked to politicians' attitudes towards risk-taking; the willingness to take risks and be proactive is more common in the business managers' and developers' groups.

In regard to attitudes towards hierarchies and centralized management in regional development, the differences between respondent groups do not reach statistically significant levels. All three groups seem to regard the current situation as too hierarchical and centralized compared to the ideal situation, thus the overall mean is negative. Furthermore, it seems that, somewhat surprisingly, the business managers seem more resistant to this tendency to restrict regional development through hierarchies. In a similar vein, the analysis of willingness to compromise brought out no significant differences between the respondent groups. However, in the last factor, the inter-regional bridging social capital seems to be valued differently among the respondent groups. The analysis indicates that developers are more interested in internationalization, specialization and seeking new partners from outside the region.

Table 5 also includes a comparison between respondents coming from various municipalities in the region. Thus, we separated respondents from the central municipality, the second layer and the peripheral municipalities. Regarding the need to create bonding social capital the analysis suggests that the respondents coming from different areas do not differ from each other. It seems that the value of social capital is fairly

generally accepted and the build-up of social capital in general is pursued notwithstanding the other circumstances. On the other hand, the need to invest in creative social capital, that is, innovativeness, initiation and visionary thinking, seems to be less understood in the peripheral municipalities than in the central municipality. It seems that the respondents from peripheral municipalities seem to resist hierarchical and centralized management in the region less. Even if their attitude is clearly negative towards hierarchies in regional development, the F-value from ANOVA was 2,880, which could be labelled tentatively significant. Finally, whilst the respondents in each group do not differ in their attitudes in regard to the willingness to compromise, they do differ tentatively in terms of their conception of the need to invest in relationships outside the region.

Conclusions

In this study we seek to illustrate the challenge a region faces in its development work. The starting point in this article was the need to know more of the region's ability to react to the techno-economic paradigm shift. With the latter's ground-breaking effects on all sectors of welfare, the regions face a serious need for renewal and innovativeness. However, like any network organization, a region is a setting for many opinions and contrasting ideologies. This confusion can constitute socio-institutional inertia, obstructing the region from taking the steps needed for development.

First, we described the role of dynamic capabilities and social capital as vehicles for mobilizing a stagnant region to development work. The theoretical framework gives reason to suggest that bare resources, even if idiosyncratic or inimitable, do not play such a decisive role in the development of the region as regional dynamic capabilities. In this framework, the relationship between dynamic capabilities and social capital forms the main structure that is needed to ensure that regional development work is successful. It is important to see at this stage, that, by and large, dynamic capabilities derive from the personal preferences and the critical consensus of the local politicians, developers and business managers.

As a case illustration, we analysed the regional actors' level of understanding of the prevailing state of affairs in the region and the development issues the region is facing. In the analysis, five factors influencing the regional development networks can be defined: (1) bonding social capital; (2) creative social capital; (3) command and control society; (4) intra-regional bridging social capital; (5) inter-regional bridging social capital. All the factors except command and control society were seen to be important in regional development (bonding social capital being the most important), whereas the command and control society factor was still strongly prevalent in practice. Some significant differences in the attitudes depending on the group to which the respondents belong were also found. The developers and business managers tend to emphasize the creative social capital and inter-regional bridging social capital factors, whereas the politicians rely more on the bonding social capital factor. Moreover, the respondents in central municipalities emphasize the creative social capital factor, whereas the respondents in the surrounding municipalities are more comfortable with the command and control society factor.

This present study confirms how difficult it is for a region to change its patterns in practice. Even if the survey reveals that regional actors are reasonably well aware of the ongoing change, the respondents considered the old-fashioned hierarchical and bureaucratic ways of action still to be prevailing in the region. However, since regions are not single decision-makers as such, taking decisive steps to change the current practices is not easy.

In regional politics, different interests and ideologies run up against each other, sometimes drastically. According to our analysis of the configuration of interests within the region, it can be said that the development work of a region is hampered by socio-institutional inertia. This inertia arises from the region's path dependency in terms

of its resources and the status quo of social contracts, that is, lock-ins. The regional social capital as a major resource capable of promoting or preventing regional adjustment is decisive in determining the region's innovative capability. It can be stated that the region's development is dependent on its ability to avoid or mitigate the stagnation arising from socio-institutional inertia.

Regions are guided through consensus and compromise. It is easier to proceed with those issues that are shared. Our analysis suggests that the Lahti region is hampered by regional lock-ins that may lead to collective blindness. The various interested parties share common views on the development needs of bonding social capital and command and control. Whilst these capabilities are important *per se*, they are not likely to renew the region; instead the region gets stuck with the existing resource base. On the other hand, two types of capabilities able to add to the regional innovativeness face varying interests within the region. The developers and business managers agreed most on creative social capital and inter-regional bridging social capital, while the local politicians showed less interest in these lines of development.

This study has also broader relevance for urban and regional studies. The role of social capital has been a widely discussed issue in this line of research. However, in the light of this study, it seems that there is a reason to distinguish between the actors' social capital in terms of general interest groups and their like, and those ties and operations, which have significance within regional development and regional policies. In this sense, socio-institutional inertia is not likely to be mitigated by just any type of social capital. This article presents a case study of one region, and further studies are needed to illustrate those policy making tools that could guide the regions and mitigate the socio-institutional inertia within the region.

Even if the development gap seems to be wide in many issues, the socio-institutional agreement is still rather vague. In the current inter-regional competition those regions that could make best use of the local path dependencies and could at the same time show new creative and innovative possibilities are the most likely to succeed. However, further studies are needed to analyse the relationship between the dynamic capabilities and the chosen regional development paths.

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Résumé

Un changement dans le schéma conceptuel techno-économique va affecter les régions, lesquelles présentent toutefois une 'dépendance de chemin'. Cette situation conduit souvent à une très forte inertie socio-institutionnelle dans le processus de transformation par lequel des régions s'efforcent de garder leur place face à la concurrence mondiale. L'article évalue le rôle des capacités dynamiques du capital social au sein du processus d'adaptation régionale. Une enquête menée dans la zone urbaine de Lahti, en Finlande, fournit les données empiriques. D'après ses résultats, les personnes interrogées ont une perception assez bonne du paradigme techno-économique dominant et de la puissante inertie socio-institutionnelle qui s'oppose concrètement au changement. Il en ressort cependant des différences systématiques dans la réactivité entre les hommes politiques et les autres décideurs. En conclusion, l'étude analyse la pertinence des opinions communes partagées concernant le développement nécessaire dans la région.

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Clashes as Potential for Innovation in Public Service Sector Reform

Abstract

Purpose – The purpose of this study is to examine the ongoing dynamics of the public service sector reform through an embedding process of a municipal enterprise from the field of basic social and health care services – a pilot model in Finland.

Design/methodology/approach - The framework of a multi-level perspective on transitions is used to describe the change process. At the lowest level of this perspective are the experimental niches acting as 'seeds of change' represented by the case organisation, a municipal enterprise operating in the basic social and health care sector. The data consists of 16 thematic interviews with the key persons of the operating system, analysed with the principles of content analysis.

Findings - The examination uncovers diverse pressures affecting niche level innovations and manifesting as clashes and controversies between old and new ways of thinking, but these clashes can also act as a platform for innovations when opened up, analysed and facilitated.

Practical implications - Clashes that appear in societal transition processes and regime changes, both in the regimes and also on the organisational level, should not be seen solely as bottlenecks, because they can act as innovation potential when opened up and facilitated. This implies the need for not only new technological, service-related and organisational innovations in the public sector reform, but also innovative practices, 'second level innovations'.

Originality/value - This paper contributes to the discussion on the ongoing change processes in the reform of the social and health care sector, emphasising emerging clashes not only as obstacles but opportunities.

Keywords - Public sector reform, innovation, health services, social services, Finland.

Paper type - Case study

1 Introduction

In the Nordic countries, like Finland, the ideology of the welfare state has been the “great narrative” in recent decades. The public sector has had the task of taking care of the wellbeing of the citizens, and this is seldom questioned. However, in the future this ideology will be facing enormous challenges. The imbalance of the municipal economies and the ageing of the population are forcing the municipalities to implement completely new operating models to maintain a satisfactory municipal service system. The extensive pressures on public expenditure can be relieved by turning around the declining productivity of the public sector, which is also the goal set by the Finnish government. These pressures have forced the municipalities to rethink the organisation of the statutory services to their inhabitants. This has promoted discussion on the role of innovation and especially on new organisational and administrative models for organising public sector services in finding a solution to this potentially grim situation.

In this article, we examine the issue of destabilisation of a regime in the public social and health care sector in Finland. We focus on one case where a new model is being implemented: a municipal enterprise operating according to the purchaser-provider model, which is used as a novel way of organising basic social and health care services. Because of its nature of a national forerunner, this model is regarded as a niche innovation, on the fringe of the existing regime. This kind of an operating environment is controversial: a new way of thinking is sought in the forms of economical action and business principles, but in the background, old habits and the history of producing public social and health services still exist. A municipal enterprise must struggle in a huge storm of demands and expectations. The destabilization of the regime is also reflected on the niche-level and manifests as controversial pressures present all around.

The research questions of this study are: 1) *What kinds of dynamics are there in this kind of organisational and administrative niche innovation* and 2) *How can these dynamics be exploited in the change process of the regime?* We tackle these questions by using the framework of Frank Geels’ multi-level perspective on transitions (Geels, 2002; Geels, 2004; Geels and Schot, 2007) and analysing the process of change in a practical case. On the basis of the interviews of the key persons, we study the relationships between the old public sector tradition and new economical demands coming from the private sector and the field of business economy. The study shows that there would appear to be controversial issues where the welfare state principle is in contradiction with the business principle. Finally, we examine how this dynamic and clash can be a platform for innovation. Opening up the instances of clash and smoothing these out will facilitate the breakthrough of niche innovations of this kind, which, according to theorists, play a significant role in societal transitions (e.g. Geels, 2004; 2005; Geels and Schot, 2007).

As a central contribution of this study, we will argue that this clash between old and new, as well between related controversial expectations, implies the need for not only new technological, service-related and organisational innovations in the reform of the public

sector, but also for innovative practices that facilitate making and embedding these innovations. These will be of assistance when creating new innovations and embedding them in the turbulent environment.

2 The change of regime in the social and health care sector

The publicly stated long-term objectives of the Finnish health policy have been to achieve the best possible level of health for all citizens and to reduce disparities in the level of the health of different social groups. In terms of its institutional structure, financing and goals, the Finnish health care system is the most similar to those of the other Nordic countries and the UK in that it covers the whole population and its services are mainly produced by the public sector and financed through general taxation. Besides primary and specialist health care, the municipalities are responsible for other basic services as well, such as nursing homes and other social services for the elderly, child day care, social assistance and basic education (Häkkinen, 2005). In connection with the welfare state expansion, as well as the ageing of the population, the duties of the municipalities have increased (Anttiroiko *et al.*, 2003). Simultaneously, the state has shirked its responsibility for funding the municipalities' statutory welfare services. This, together with globalisation and socio-economic, demographical and technological development trends, has led to the economic crisis in many municipalities since the beginning of the millennium. The ageing of the population in particular, meaning both the decreasing number of employees in service occupations and, simultaneously, the growing number of people in need of services, is a phenomenon for which municipalities must prepare. Thus, we are faced with a situation in which the rather stable environment of the municipalities is undergoing considerable and unpredictable changes.

Traditionally, the public sector has produced the services itself as a result of political decision making. However, the law provides that municipalities are only responsible for arranging services for the inhabitants, not producing them (Valovirta and Hyvönen, 2009). Organising the public services has become more versatile in the past few years, and there have also been other reforms in the public administration in the spirit of New Public Management paradigm (Forma *et al.* 2007). The new ways of producing services include the privatisation of services, purchaser-producer models and outsourcing. The trend where the share of public services is getting smaller and the new ways of operating are increasing has been strengthening for the past few years. The central aim of the public sector reform in the present decade has been to increase productiveness and efficiency, to secure the availability of services and to increase the economic growth, competitiveness and employment. (Niemelä, 2008, 47.) In spite of these aims, empirical studies (for example Forma and Vaalavuo, 2008) show that the outsourcing of the services is seen only as an additional way to produce municipal services. This is not, at least not yet, a question of a total change of paradigm; the change has been gradual and there is still commitment to the old system in many ways and in many levels (*ibid.*).

In spite of the orientation of using private sector-style models in the public sector, it should be noted that the goals of public sector organizations differ from those in the private sector because the former are driven by the goal of creating public value while the latter should aim at creating private value (Moore 1995). Moore defines public value as the equivalent of shareholder value, or private value, in public management. However, in the public sector, the overall aim of managerial work seems less clear and the public sector value is much more difficult to define; and the practical measurements what managers need to do in order to produce value, is far more ambiguous. The efforts of public sector managers are not evaluated "in the economic marketplace of individual consumers but in the political marketplace of citizens and the collective decisions of representative democratic institutions." (Moore 1995, 31) In other words, the public organisations aim to deliver not only value for individuals, but also value for people as citizens as a collective (Moore 1995).

The process of change can be studied as a change of socio-technical regime in the public social and health care sector. The term 'socio-technical regime' was introduced by Frank Geels (2002). It is an extended version of Nelson and Winter's (1982) technological regime and refers to a semi-coherent web of rules, meaning both the commands and requirements, as well as the roles and practices that are being established (Geels, 2005; Kemp *et al.*, 1998) These rules guide and orient the activities of social groups, including scientists, users, policy makers and societal groups that interact and form networks with mutual dependencies. (Kemp *et al.*, 1998; Geels 2005; Geels and Kemp 2007). When these rules are linked to one another, what results is the coordination of the activities of different social groups. (Geels, 2005). The degree of alignment or tension in this web of rules is an indicator of the stability of linkages in socio-technical systems. In stable systems, the rules are well adjusted and the incremental changes are aligned and go in the same direction. (Geels, 2005). The socio-technical regimes stabilize existing trajectories in many ways: cognitive routines, regulations and standards, the adaptation of lifestyles to technical systems, as well as investments sunk in machinery, infrastructures and competencies (Geels and Schot, 2007). Regimes do not fix choices, but are open to changing regime components and the overall architecture according to changes in social needs, technological possibilities and organisational change (Kemp *et al.*, 1998).

Sometimes, however, the regime may destabilise due to changes in the socio-technical landscape. "Socio-technical landscape" refers to those aspects of the exogenous environment that are beyond the direct influence of the actors. It may include aspects such as macro-economics, deep cultural patterns and macro-political developments. Landscape-level changes usually take place slowly, but may put pressure on the regime. (Geels and Schot, 2007.)

System changes occur through the interplay of macro-level landscape changes, meso-level- regime-changes and micro-level "niche" novelties born outside or on the fringe of the regime. Geels has described and depicted this process of change as a multi-level perspective on transition. (see Figure 1).

Increasing structuration
of activities in local practices

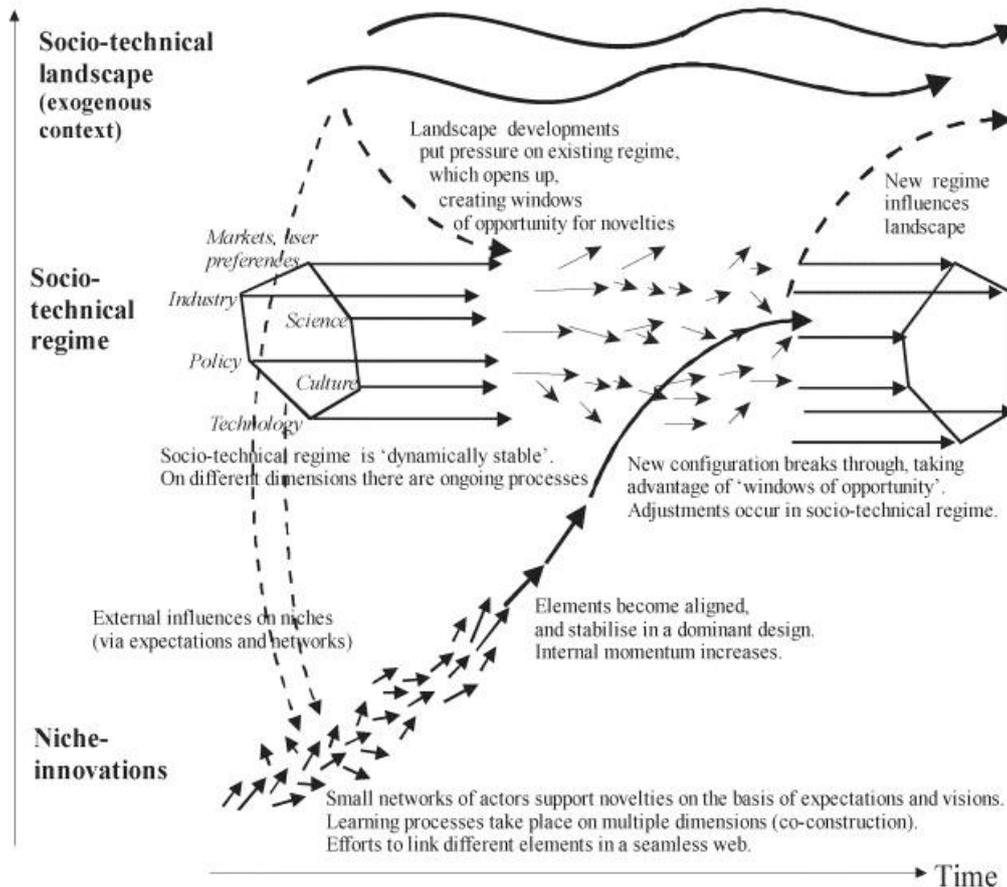


Figure 1 . Multi-level perspective on transition. (Geels and Schot 2007; 401)

In the health care sector, the socio-technical regime consists of the service production structures, regulations, markets, customer needs and demands, professional practices, medical knowledge, established technologies and cultural meanings related to services. The stability of the regime is maintained by service organisations, health care professionals, technology companies, research institutes, political actors, interest groups, and the media. The prevailing system is not easily changed, and innovation

activities within the regime are typically incremental and do not question the prevailing regime. (Kivisaari and Saranummi, 2008.)

However, the ageing of the population and the pressures for productivity are significant landscape-level factors creating pressures on the social and health care regime. These ongoing processes on the levels of regime and the landscape may create a window of opportunity for niche novelties (Geels, 2004). In times of destabilisation of regimes, windows of opportunity open for niche innovations, local experiments that through their breakthrough will play an important role in the regime change (Geels, 2005). Kivisaari and Saranummi (2008), who have studied the change of regime in the social and health care sector in Finland, have noted that besides the common vision of the need for innovations in the social and health care sector in Finland, and besides local niche innovations, the process of adopting and spreading those innovations and the institutional change has been slow (Kivisaari and Saranummi, 2008). Because of the quite stable status of the public sector and a long tradition of keeping the public and private sectors apart, certain belief systems have stuck quite fast, but by facilitating the mutual adjustment of different belief systems appearing in the niches it is easier for those radical novelties to break on the level of the regime and further assist the adjustment and restabilization of the of regime.

3 The role of innovation in the change of regime in social and health care

The role of innovations has been strongly emphasised in several spheres of life. The rapid change of the operating environment has resulted in a situation in which economic and social success is strongly dependent on structural reform and innovating ability (Hämäläinen 2007). Innovativeness is seen as one of the most important strategic abilities to hold up well in the rapidly changing environment (Stähle 1998; Schienstock and Hämäläinen, 2001).

Innovation policies and funding structures in Finland have only lately begun to direct their actions towards innovation activities in the public sector and the organisational development of public health care as well. (Kivisaari and Saranummi, 2008). The public sector is faced with the challenges of how to deliver high quality public services that provide the best value for taxpayers (New Nature of Innovation) The profits of innovation activity are typically linked to productivity and quality: to using the funds allocated to it with an excellent price-quality ratio. This refers to a more efficient way to produce and organise existing tasks and the better quality of the existing services in the forms of user effectiveness, for example. (see e.g. Valovirta and Hyvönen, 2009). The widening of the concept of innovation is recognised in the innovation policies and support mechanisms, which have also noticed the meaning of social innovations and the systemic and interactive nature of innovation processes (Kivisaari and Saranummi, 2008).

The main focus of innovation research has traditionally been on innovations related to technological innovation within manufacturing, reflecting the fact that innovation theory

has its roots in a time where manufacturing was still the major economic activity. This means that the social aspect of innovations has been left aside in technology policies and in the new growth theory that lies in the background. (e.g. Drejer, 2004; Ruuskanen, 2004) Innovation research, too, has traditionally focused on the study of radical innovations that are easily perceived. The definition of innovation has, however, been expanded (e.g. Kline and Rosenberg, 1986; Lundvall, 1988), which in turn has enabled and promoted discussion of innovation activities in the public sector as well. The widening of the concept of innovation means that, besides technological product innovations, discussion of other viewpoints and classifications of innovations has emerged as well. These other classifications include for example service, process, organisational, marketing, positioning, rhetorical, conceptual, administrative, governance and social innovations. (e.g., Afuah, 1998; Tidd *et al.*, 2005; Hartley, 2006; Hartley and Skelcher 2008; Ståhle *et al.*, 2004)

Innovations in the social and health care sector have also been examined from the technology-oriented point of view (Kivisaari and Saranummi, 2008). However, the social and health care sector is largely based on services. Instead of being single service acts, service innovations are often linked to holistic service processes or organisational models, and in this context we can talk about service delivery innovations or process-related, organisational or administrative innovations (e.g. Windrum, 2008), which have been examined in studies on private sector innovation (Windrum, 2008). The cost-efficiency of the existing service responsibilities is accentuated in the social and health services, and this is sought through administrative and service system innovations (Valovirta and Hyvönen, 2009). In the context of the public sector there is also much discussion on social innovations, but it should be noted that the concept of social innovation is far from clear and has a variety of definitions. Social innovations can broadly be defined as reforms that have social consequences in the form of meeting and creating social needs. These can be novel solutions to social problems that are “more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals.” (Phills Jr *et al.*, 2008). In somewhat narrower sense, social innovations are defined as changes in the cultural, normative or regulatory structures of the society which enhance its collective power resources and improve its economic and social performance (Heiskala, 2007). Social innovations mean a significant expansion of the technology-based concept of innovation, but social innovations can also be intertwined with technology. In the so called fusion model of social innovations it is argued that all innovations are intertwinings of social, technological and economic aspects (Joutsenoja and Lindh, 2004). This definition is close to the concept of systemic innovation, which refers to co-evolutionary change processes in technologies, user practices, regulation, industrial networks, infrastructure and cultural meaning (Geels, 2004; 2005). In systemic innovations the renewals are simultaneously targeted at processes, services, structures, organisation methods and technology (Kivisaari and Saranummi, 2008).

In Geels' multi-level perspective on transition, much attention is paid to the micro-level of the model: experimental *niche* innovations that are carried and developed by small

networks of dedicated actors, have no connections to stable rules and often occur outside or on the fringe of the existing regime (Geels and Schot, 2007; Geels and Kemp, 2007). These radical innovations are born either in response to landscape changes or in a bottom-up fashion. Niches can act as spaces for experimentation protected from market selection pressures or enable social networks supporting radical innovations to be built. These niches can then provide opportunities for the society to learn about, e.g., the functionality of alternative designs, user preferences, appropriate public policies, etc. Within niches, rules and social networks will be both less clear and more uncertain than in established regimes and it is likely that, due to mismatches with existing regimes, radical new socio-technical systems cannot easily break through (Geels, 2004).

New technologies and other type of innovations may remain stuck in these niches for a long time when they face a mismatch between the existing regime and landscape. Breakthrough depends on external circumstances, i.e. 'ongoing processes' at the levels of regime and landscape, which create a 'window of opportunity' for the radical novelties. There may be changes at the landscape level, which put pressure on the regime, or there may be internal problems in the regime, which cannot be met with the available innovations. (Geels 2005.)

This is why niche innovations are called "the seeds for change" (*ibid*, 83). The wider breakthrough is followed by a stabilization and new types of structuring. These kinds of dynamics and interplay on different levels reinforce each other and lead to system changes and transitions (Geels and Kemp, 2007). Despite the important role of the niches in the transition process, alignments of processes on multiple levels are emphasized: niches can only diffuse more widely if the circumstances are favourable to them, *i.e.*, if they link up with ongoing processes on the levels of regime and landscape (*e.g.* Schot and Geels, 2008). In the social and health care regime, the ageing of the population, along with other landscape changes, create pressures for the regime, and windows for opportunity may be opened for new services, new service structures, and new technologies alike (*e.g.* Kivisaari and Saranummi, 2008).

Embedding and orienting the niches are crucial elements of transition, and there is a demand for tools for this process (Kivisaari and Saranummi, 2008; Kivisaari *et al.* 2009). Several approaches to directing and orienting the technical change toward social goals, and facilitating the diffusion of radical innovations have been suggested, including, *e.g.* the strategic niche management approach (Kemp *et al.*, 1998), the transition management approach (Rotmans *et al.*, 2001; Kemp and Rotmans, 2005), and the societal embedding of innovations approach (Saari and Kivisaari, 2009; Heiskanen *et al.*, 2009; Kivisaari *et al.*, 2009). All these approaches have slightly distinctive focuses, but the common idea in all of them is to strengthen the dialogue and interactive learning between the stakeholders on different levels. In this context, however, less attention is paid to the internal dynamics of niche innovation and its influences in the regime change, which are the focus of this study.

4 Case: The centre for basic social and health services Oiva

In order to better understand the dynamics of new operational models in the change of the public social and health care sector, we have chosen to conduct a case study of a municipal enterprise, a pilot in organising basic social and health services according to this model in Finland. The focus is on the process of change in the service production of five municipalities which, earlier, produced their services separately, to a municipal enterprise, owned by the municipalities, operating in the purchaser-producer model. The case organisation performs the statutory tasks of municipalities as a provider of services for the inhabitants, but it has striven for a new way of thinking, taking influences from the operational logic of the private sector. What was behind the new organising model was the challenge of how to provide the services in the small municipalities in the future, when the need for services constantly increases, there is a threat of a lack of professionals, along with the reality of the ageing of the population. (Interview of the director of Oiva).

This municipal enterprise, called 'Oiva', is a novel functional model which combines the basic social and health care services of five small municipalities in the Lahti Region in Southern Finland. It began its operation in early 2007 and is a national pilot in organising the basic social and health services in Finland according to the municipal enterprise model. Oiva can be considered to represent a radical reform because it was the first municipal enterprise of a large scale in the field of social and health care in Finland, covering the entirety of basic social and health care services. The change was made according to a schedule spanning a few months.

Oiva has approximately 700 permanent employees, and it is a non-profit commercial enterprise owned by five municipalities (Asikkala, Hollola, Hämeenkoski, Kärkölä and Padasjoki). The organising model is a purchaser-producer model where the purchaser is the joint board for social and health services (later: purchaser board) in the western cooperation district. It is a political organ comprising of local politicians. The producer is the centre for basic social and health services Oiva, where the decision-making organ of the organisation is a board comprising of professionals (non-politicians) coming from different fields and sectors. (Interview with the director of Oiva.)

In a municipal enterprise model the activities are organised according to economic principles and the duties are carried out according to profitability demands. Key words are efficiency and transparency. This means that the activities are funded with cash-flow financing and the prices are market-based. The customer relationships of the municipalities are based on contracts and the purchaser has discretionary power. (The business plan of Oiva 2008-2015.)

The major change was that the social and health services of five municipalities were combined to an enterprise owned by those municipalities. Previously, each municipality produced its own services, but now the joint purchasing board for social and health services purchases the services from the producer, Oiva, which in turn purchases

certain services from private and third sector service providers. Oiva has defined the prices for its services, making it easier to make a decision whether to produce the services oneself or to buy them from outside.

In the business plan of Oiva, the vision of Oiva is defined to be "a business oriented forerunner in municipal social and health care services". Its basic strategic task is defined as "strengthening the wellbeing of the inhabitants by motivating them to take responsibility for their wellbeing" and "securing the prosperity of the municipalities by producing or subcontracting cost efficient, quantitatively and qualitatively adequate social and health care services that are based on preventive work" (The business plan of Oiva 2008-2015).

In the following we will further analyse, on the basis of empirical data, how this combination of business orientation and municipal background has been fitted together.

5 Conducting the study

In this study the aim was to examine the dynamics of an organisational and administrative niche-innovation through a case study in a regime change in the social and health care sector. The dataset consists of individual interviews with the key persons of the operating system of the case organisation. These were conducted in autumn 2008. On the producer side (Oiva), the interviewees included the board, comprising of professionals coming from different sectors (six members and one vice member) and the executive committee, comprising of the director of Oiva and division directors (six persons). The purchaser side interviewees included the purchaser manager and two members of the purchaser board (local politicians).

The interviews were thematic interviews, each of which lasted for about one hour, and the questions dealt with the roles and tasks within the operating system, the changes that Oiva has brought about, as well as the indicators and evaluation. The interviewees were also asked to give suggestions as to what should be improved. The questions varied somewhat according to the group, *i.e.*, whether the questions dealt with the producer or the purchaser side.

The analysis method was content analysis, in which inductive and deductive phases took turns. The idea was to arrange the material into themes, keeping in mind the vision and aims of Oiva, including being a business-oriented forerunner and a municipal service provider at the same time. The main themes were called "business orientation", referring to the operating models familiar from the private sector, and "public sector tradition" reflecting, for instance, the welfare state principle. These themes were then divided into sub-themes according to their contents and a way to talk about these two sides of being a municipal enterprise. After that we analysed the collisions and ambivalences, taking into account existing literature, and, finally, discuss how these clashes may act as fruitful platform for innovation and affect the regime change.

An example of the analysis:

Utterance: “ <i>if there are patients coming to the health centre, we cannot turn them back from the door</i> ”
Contents: the patient’s rights to have care
Sub-theme: public value
Main theme: public sector tradition

The dynamics in the embedding process are seen in the different ways of talking about the change. These are described in the next chapter.

6 The dynamics appearing in the process of change in the new organisational model

Our starting point was that regime-level dynamics are reflected on the niche level as well. In the first phase of the analysis of a municipal enterprise model, we mapped the elements of two opposite ways of thinking - the business-oriented thinking (which is the objective of the case organization) on one hand, and the old traditions of providing services in the public sector, familiar from the welfare state tradition, on the other. The second phase was to analyse how these two ways of thinking meet, and what kinds of possible collisions and clashes emerge from that encounter.

6.1 Business orientation: “*It is a business like any business*”

The objective of business orientation in the case organisation is seen in the ways of talking about business and innovation logic; these thoughts are familiar from the private sector. On the basis of the data, the main theme was divided into sub-themes. These are depicted in the Figure 2:

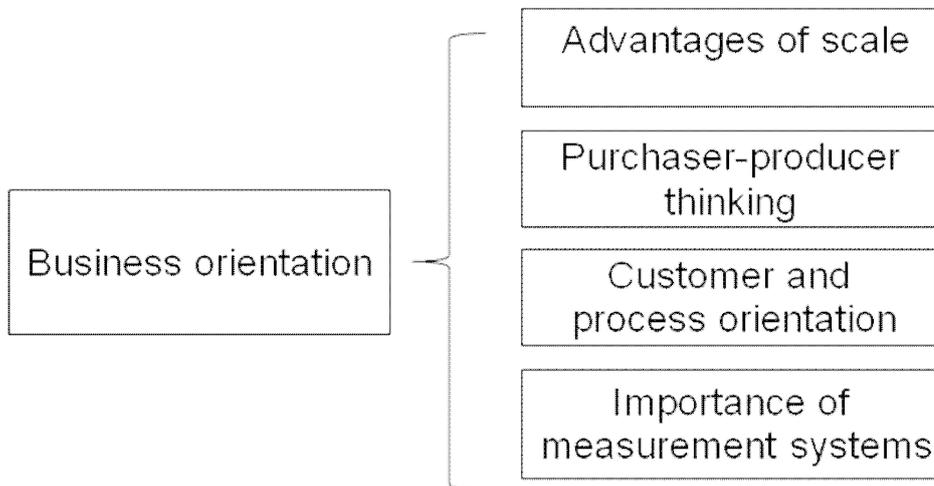


Figure 2. The main theme "Business orientation" and its sub-themes.

In recent years, demands for cost efficiency have increased in the production of services in the public sector, and this discussion is also going on at Oiva. As the next interviewee (a member of the board, with a background in management in the private sector) states, there would be a lot of possibilities for improvement in issues related to the systematic follow-up of costs and knowledge about the roles and tasks of partners working for the same goal.

"I have always wondered the discussion about why it is so difficult to make public sector services more efficient...Nothing should be more simple, when you look at how poorly they are organized so far, now that they are based on political principles instead of efficiency principles. For example, there has been very little follow-up concerning production factors, how much it costs to produce the service [...],and no idea who is doing what[...]So I see only opportunities here...huge opportunities for improvement." (a member of the board, working in the private sector)

The members of the board do pay attention to the prevailing ways thinking in the public organisations; in this way of thinking it is assumed that there is some kind of a bottomless storage of money in the municipalities that can be used if budgets are being exceeded. They note that the organisation should itself be responsible for its own actions and analyse the reasons for economical problems.

When Oiva was founded, there were many wishes and demands in the spirit of a total reform - doing everything differently than before in order to manage the productivity challenges.

“As a principle I would say that nearly everything that would somehow shake the present way to do is somehow inevitable for surviving the future challenges” (a member of the board)

The aim was a radical, purposeful change. The director mentioned that the wish was to question the previous habits and ways of action which were seen as unbearable in the long run. At least four main reforms were conducted or at least aimed for; these are presented in the following.

6.1.1 Advantages of scale

A concrete major change was combining the social and health services of five municipalities under the same organisational roof in order to gain scale advantages. The municipalities have given a statement of “one common Oiva”, meaning that a decision has been made to strive for uniform services in every municipality, and that the service production in the whole Oiva area can be utilised flexibly.

This change has naturally had practical and cultural influences as well. The interviewees revealed that the aim of combining the resources of five municipalities was to gain efficiency and make the services available for everyone, *“but not necessarily available behind the corner”* (a member of the board) Thus, it allows flexibility for the service provider, but demands flexibility from the service users as well.

The workers are now employed by Oiva instead of their respective municipalities. This affects the work community identity but also offers possibilities for networking, which is felt to be of particular importance to those special workers, like physiotherapists, who have been the only representatives of their professions in the small municipalities.

Combining certain municipal activities of five municipalities that there are now five municipal executive boards and five municipal councils, as well as other organs in every municipality that have to be informed and cooperated with. This poses challenges and makes everything more complicated because the operational models are not the same in every municipality.

6.1.2 Purchaser-producer thinking

Another major change was the shift into the purchaser-producer model. Earlier, each municipality produced its social and health services on its own, but now there is a common purchaser organ and a common producer. There has been a lot to learn in this kind of a model on the level of policy, as well as among the actors themselves. It would appear that there has been some confusion regarding the roles and the division of responsibilities between the producer and the purchaser. The interviewees told that there has been very little dialogue between the purchaser board and the producer, which is seen as confusion as to which organ should make which kinds of decisions.

“There should be discussion about the borderline so that both sides would have the same conception of which side belongs to the board and which side belongs to the purchaser. But now there is a grey area in between them.” (a member of the board)

The official policy is that the purchaser board should make the decisions concerning the rights of the inhabitants as well as the availability of and criteria for the services, while the board should make the decisions concerning operative activities – *i.e.*, how the services should be produced. When the contracts have been made, the aim is that the producer could work in peace.

6.1.3 Customer-orientation

In recent years, process thinking and a customer-oriented approach have been the cornerstones of industrial production, and they have been applied to practice in the public sector. Health policies across OECD countries have sought to promote opportunities for users to be included in the healthcare, from treatment decision making to service evaluation and development, called for instance patient-centred care or patient and public involvement (PPI) (see *e.g.* Tritter, 2006; Tritter, 2009; Tritter *et al.*, 2010), meaning involvement that could be either individual or collective, either direct or indirect (Tritter, 2009; Tritter *et al.*, 2010). In Finland, the choice of health services in practice is quite limited, and the user involvement has been mostly indirect, exercised through local elections. (Tritter, 2006; Tritter, 2009; Tritter *et al.*, 2010) In the case organization Oiva, the focus of customer-orientation has been service development by development of fluent service chains across units and organizations. On organisational and inter-organisational levels, this means looking at customer processes and service paths from the point of view of the patient, instead of organisational units. Seamless customer chains, citizen-centredness and horizontal integration across the boundaries and silos are one of the trends of recent public sector innovation discourse (Innovation in public services, 2005; Benington and Hartley, 2009). Related to this, new organisational and financial architecture, which would support whole system rather than silo-based leadership development, is required (Benington and Hartley, 2009).

The central issue in process thinking is minimising the amount of non-productive time, *i.e.* waiting, queuing and making things clear. Developing the effectiveness of the processes aims at creating working models for both decreasing the costs and creating value for the customer and the personnel in the form of faster treatment and the saving of time. (*e.g.* Lillrank *et al.*, 2004) Interfaces between organisations are big challenges for the process. Same operations are often performed repeatedly when moving to another unit, organisation or branch. The interviewees mentioned losing resources because of inadequate dialogue between units and organisations. There seems to be a lack of knowledge about the responsibilities and resources of the parties in the service chain. Idle work is being done both in management and the basic tasks.

“Process management would be a good way because if only these organisational units exist, we can improve the inner efficiency of a unit, but it does not perform our holistic task of producing the basic services to the purchaser, who has set demands for quality, quantity and cost...we do not necessarily see where the bottlenecks are. The customer must be the starting point, because otherwise we spend all our time pondering how we can keep the customer out of our table.” (a member of the board)

Breaking down departmental “silos” and cross-departmental co-operation is one of the trends in public sector innovation (see Innovation in Public Services). Efficiency can be gained through rethinking job descriptions and task divisions, which is being done in Oiva as well. More and more, nurses become responsible for tasks that used to be the responsibility of doctors.

Also the use of technological devices and outsourcing the non-core tasks are being discussed; for instance, tasks that are not linked to immediate nursing work could be completed in some other way.

“Working methods, like a rehabilitative working attitude can increase productivity. By encouraging independence in home care people can live in their homes for longer and institutional care is not needed.” (a member of the executive group)

Some new posts have been established in the organization by altering existing job descriptions. An example of these is the position of a coordinator for brain stroke patients, the purpose of whom is to liberate nurses’ time for other tasks by being responsible for the service chain of a certain patient group, This is especially crucial when a patient is being discharged from hospital. New technology and outsourcing the tasks that do not belong to the core tasks of the organisation are used as well: automatic medicine delivery and outsourcing the meal services are in the process of being tried out in practice in Oiva, for instance.

6.1.4 Importance of measurement and indicator systems

Value in the public sector can be a complex concept and thus difficult to measure (Hartley 2006). One element of efficiency thinking is paying attention to measurement and indicators. One concrete measure in Oiva has been to define the prices of its service products in order to facilitate making comparisons as to whether the services should be produced internally or bought from outside sources.

Pricing this kind of service products is a new practice in Finland – this was the first time that a social and health care organisation in the public sector has assessed how much its own production costs. This also makes it possible to see the variations between municipalities and to discern whether there are some functional differences that cause the differences in prices and should be examined.

Defining the prices also seems to have a policy-related function: it assists in eradicating the attitude about the public sector as an automatic service production machine that can be kept going indefinitely with the inexhaustible reserve of public funds. *“Defining the prices for the services shows the decision makers and the public what this really costs.”* (a member of a board)

However, increasing productivity also requires finer measurements than merely defining the price of the products or the revenue. The interviewees are of the opinion that there should be interlinked indicators on different levels; the sum indicators would consist of smaller indicators and the aims of individual workers. *“Every worker is in the same boat, and the chain is as strong as the weakest link of the chain...”* (a member of a board)

6.2 Public sector tradition: *“We cannot think that if the elderly care is not profitable, we should change the focus.”*

Even though Oiva has striven to be a forerunner and border-breaker as a new model, it cannot begin its development from scratch. There is a long public sector health care tradition behind it, as well as social and health care laws, public sector tasks, working habits, existing structures and municipal decision-making processes that may act as restrictive elements in the development work. In this context, the second main theme that was discovered on the basis of the interviews was 'Public sector tradition', with again sub-themes depicted in the figure 3:

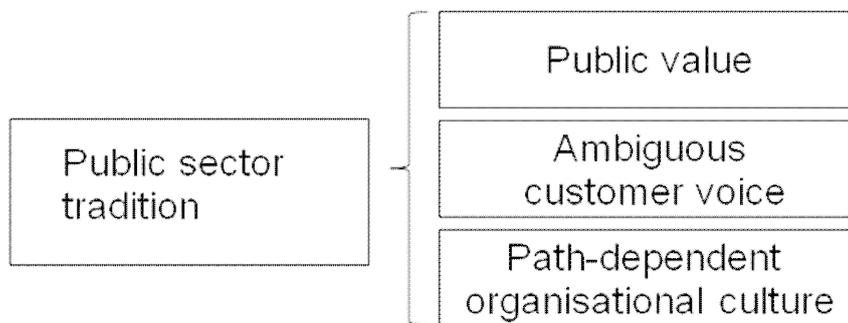


Figure 3. The main theme “Public sector tradition” and its sub-themes.

The challenge is to find novel solutions, but this must be done within the framework of health care legislation. This kind of a setting would appear to harbour some collisions. A member of the purchaser board told that he had heard people wondering about how it is

even possible to have an enterprise in municipal social and health services, because the two concepts sound so incompatible. The interviewees also told that the old way of thinking is still there in the idea that what is political cannot possibly be economical. The public sector tradition is seen in the three main ways of thinking presented below:

6.2.1 Public value

The concept of public value highlights the importance the public services, and their central role in the wellbeing, sustainability and growth of communities, cities and nations (cf, Hartley and Skelcher 2008, 1) Public value in the public sector is correspondent to stakeholder value in the private sector (Moore, 1995). It refers to increased social, economic, political or environmental value in the public sphere (Hartley and Skelcher, 2008; Benington and Hartley 2009), and is anchored in a collective democratic process with users not only as consumers but also as citizens (Brookes and Wiggan, 2009). The unit of analysis of benefit may not therefore necessarily be the single organisation and its outputs but also extends to consideration of outcomes across an 'institutional field', (Moore 1995), i.e. the public value of health care is developing healthy citizens capable of contributing to society.

Even though we deal here with an enterprise that aims for profitability, it cannot always work according to business logic. In order to promote public value in the public sector, there are some restricting elements that the interviewees mentioned, including, for example, health care legislation concerning the availability of services, the patient's guarantee (the maximum time during which the service should be provided) or other official demands or recommendations concerning for example the minimum number of workers per patient. (see also Forma and Vaalavuo 2008.)

Patient guarantee and other "restricting" elements that interviewees mentioned, are actually embodiments of public value, and belong to the creation process of public value. These are seen simply as elements to get along with, and they must be accepted. Sometimes people feel that laws and instructions seem to be chaining them up, as it were; some issues cannot be handled in the way they would like to do it.

"In the private sector we can close the unit if products are not selling, but if we do not have money in the budget and there are patients coming to the health centre, we cannot turn them back from the door." (a member of a board)

Legislation change is also seen as an unpredictable and unmastered factor that must be lived with:

"Out of the sudden they decide on the state level that this and this basic service will be the municipalities' responsibility. We have to endure and overcome these surprising shocks." (a member of the board)

On the other hand, one interviewee mentioned that sometimes laws can be used as an 'excuse' for not making changes. The legislation states that the basic services must be produced even though they are not profitable, but that, in turn, is a place for an innovation for producing them in a more profitable way

6.2.2 Ambiguous customer voice

The public value means the value for people as citizens and not only value for individuals (Moore 1995) According to Tritter *et al.* (2010), it is important to distinguish the roles of public as citizens (voters), taxpayers, and consumers, even though they are often used interchangeably.

According to the democracy principle, inhabitants have the right to participate in the decision-making regarding, for instance, the use of the tax money. Municipal decision-making is based on the democracy principle, which makes it possible for the inhabitants, at least in principle, to participate in the decision making. However, the role of the inhabitant as a user of services, as a participant or as a decision-maker is not clear. In Finland, the citizen involvement and emphasis has become articulated in the context of customers and clients, rather than in terms of public participation or deliberative action (Tritter *et al.*, 2010).

Traditionally in the public sector, the services are produced *to* the user, not *for* the user (e.g. Jung and Osborne, 2009). The starting point of this kind of thinking is the service producer organisation characterised by a high level of professionalism. This tradition sees the user as a patient, a target of services, as opposed to an active customer whose wishes and demands should be taken into serious consideration. It is typical of the public sector that the role of customers in the development work is seen as a sort of a burden. The inhabitants must be listened to as a part of the job and they are seen to cause extra work in the form of various demands and questions. In some cases the citizens can be seen as some sort of a threat, and the results of their initiative can even be feared. (see Pekkarinen *et al.*, 2006.) The interviewees state that systematic and unified customer feedback system is under consideration, but, so far, feedback has been quite scattered and unsystematic.

In recent times, even more attention has been paid to the nature of customership in the public sector because of its problematic nature. In the public sector, the customers only pay for a small share of the services directly. At the same time, discussion has been raised about the role of the service user as a customer or even a consumer instead of a passive patient or client (about the terminology, see e.g. McLaughlin, 2009). As a customer, a service user has wishes and needs that should be taken into consideration in development work. Customers are more aware of their rights, but besides the rights, the responsibilities of the service users were also something that the interviewees wanted to talk about to a great extent.

"Individuals expect to get 'everything for themselves right away.' The customers' job is also to see what the task of the public sector is and what it is capable of with this money". (a member of the executive group)

The interviewees also suggested that there should be incentives for people to take care of their health, to generate savings in care costs.

6.2.3 Path-dependent organisational culture

The organisational culture in the public sector is often characterised by hierarchy and bureaucracy, which are seen incompatible with innovation (see e.g. Borins, 2001; 2002, Vigoda-Gadot *et al.*, 2008). Public sector organisations continue to emphasise the values of a bureaucratic or hierarchical organisational culture in spite of the encouragement to put greater emphasis on change, flexibility, entrepreneurialism, outcomes, efficiency and productivity (e.g. Parker and Bradley, 2000).

Cultural change is slow due to path dependency and lock-ins that may have an effect on the unconscious level, even if the need for change is recognised. Path dependency refers to a dependency of the past: decisions made in the past affect later decisions. In times of change, the biggest hindrance for rapid adjustment is often the mental inertia; in other words, the rigidity of people's mental paradigms that block growing socio-institutional problems from their minds, and the slow pace at which people "unlearn" their outdated mental paradigms (Hämäläinen, 1999). The routine behaviour of organisations, specialized resources, inward-looking networks and durable institutions can lead to political, structural and cognitive lock-ins, and these can be a barrier for change (Grabher, 1993). For example, the change of the organising model does not happen if people think according to the same municipal logic. The possible mental rigidities of decision-makers with a municipal background are making some of the interviewees worried. There is some questioning about how decision-makers could begin to think in a fresh way:

"The idea is totally different, as we have become producers. However, the same people are in command; they should rethink and be courageous but somehow it has appeared that some of them are quite stuck in the old logic of service production, and there has not been readiness to question the way to produce services. A fundamental question is how the executive group (johtoryhmä) manages the change and how well they internalize that we are now producers who provide services to the purchaser." (a member of a board)

Another issue that the interviewees mentioned was sticking into the traditions of buying services from a certain place:

"Everything is not thought through from the point of view of competitive bidding, for instance, the question why certain laboratory analyses are not subjected to international

competitive bidding instead of purchasing them from the same old place. There are such old ways of thinking left.” (a member of the board)

What is interesting, is that there is still a discourse about “greater forces” or some kind of a destiny that determines the course of the actions. A member of the board wondered why it is typical in the public sector to lean upon irresistible “outer forces” when talking about economy.

”They may say that nothing can be done, this is our destiny. This is the public sector way of thinking, not from the economic point of view.” (a member of the board)

According to this interviewee, the public sector still lacks a culture of analysing the reasons for exceeding the budgets and trying to do something about it. According to the interviewees, it is evident that the process of change will last several years. The personnel are also used to working in a certain way, and it cannot be expected that their working habits would change immediately.

7 Discussion: Overcoming the clashes between the old and the new, and potential for regime change

When examining the data in more detail, it can be seen that a new model influenced by and operating in a shaky environment faces many opposing demands and issues that do not fit together naturally. This appears as a time of destabilisation, which one member of the board described as *“a mess of business principles and municipal service production logic.”* For instance, the question of how to measure productivity in public sector services is very challenging because of it including intangible and co-effective elements and taking into consideration issues of effectiveness and creating value to the customer (e.g. Nordgren, 2009; Linna *et al.*, 2010). The interviewees stress everything cannot be expected to work perfectly right away. The change is slow, and the change in thinking in particular does not take place immediately, even if the structures and organisational models would change.

When a model that is known to work in some context is transferred into a new context, there is a danger that not everything will fulfill their role in the new environment. For instance, while in the private sector procurements are done only if they are seen as profitable, in the public sector procurements are regulated by procurement legislation, This may cause ineffectiveness and increase bureaucracy. (Eräsaari, 2006.) Those opposing the the ideas of New Public Management and consumerism state in their critique that when private sector principles are implemented unchanged to the public sector, problems are bound to emerge (e.g. Jung and Osborne, 2009; Eräsaari, 2006). The opportunity to choose is seen as empowering and positive from the point of view of customers, but it is possible that it can lead to further inequalities (Jung and Osborne

2009). The question of empowerment is not simple in the field of knowledge-intensive services, such as health care. To be consumers, patients must have the necessary information to choose, and their choices must change the service provision (Tritter 2006, 41). Consumer sovereignty and choice requires that the customer possess a great deal of information and knowledge. (Windrum 2008.)

On the other hand, consumerism poses the question of who has the right to use and target the public funds. User involvement "draws the public into the collective consequences of individual action." (Tritter 2006, 43). This is related to the roles of stakeholders as citizens or customers in the changing situation. The consumer role influences the citizenship role (Aberbach and Cristensen 2005) and makes it more individualistic. The rights and responsibilities of citizens are very different from those of customers. There is a controversy between democratic controls based on rules and regulation and market type controls that are based on consumer satisfaction. (Windrum 2008.) The democracy aspect as a public sector principle leads to seeing the service user as a citizen who has right to affect the decision-making in a political way. Now, however, when the customer-oriented approach has broken through in public sector service development, at least on the ideological level, there has been discussion about more direct ways of having the service users participate in the service provision. There may be a difference between interests if a person is simultaneously in the role of a citizen (tax payer) and a customer (service user). The unclear situation is also manifested in the form of many controversial demands and discussion in the air regarding the customers' roles and expectations. This is evident in our data as well. For example, there is a demand to increase the customers' personal responsibility of their health, but at the same time there is a concern about customers becoming more and more demanding.

The customer-citizen dilemma comes into light particularly when the purchaser-producer model in the public sector is examined in detail. The model originates from the private sector and has been benchmarked in the public sector, but it is essential to note that it works differently there because of the political nature of the decision-making. This essential difference concerns the contact surface with the customer, which affects the knowledge about the customers' needs. The customer-oriented approach to services is considered more and more important in the public sector, but in that particular case, the problematic issue in the purchaser-producer model is that the purchaser should follow and evaluate the needs for and availability of the services but has not direct contact surface with the service users. In the business networks of the private sector these problems do not exist because the leader company of the network usually is in contact with both customers and sub-contractors. The representative of the purchaser spoke about this essential controversy: "*The role of the purchaser is very problematic because we don't really know what is really needed, nor the quality and level of things that are needed.*" (a member of the purchaser board)

The clash in the purchaser-producer model applied in the public sector is evident in the way the model separates the so-called citizen needs and customer needs. The

purchaser board as a political organ has the mandate from the inhabitants to represent their needs as tax-paying citizens, but it gains access to the feedback from the actual service users indirectly at best. Furthermore, democratic structures are prone to political games and bargaining. The decisions are not based only on the aggregate good but may also aim at defending the perquisites of different interest groups. Maybe the most challenging feature in municipal decision-making is the logic of representative democracy. The political decisions are often steered by the aim of getting re-elected, making long-term innovation processes very difficult. Municipal elections are held in Finland at four-year intervals, rendering the planning horizon very short. Therefore making difficult decisions that enable innovation processes to take place is often impossible in practice.

The question is the flow of information concerning user feedback between producer and purchaser. If the interests of the purchaser and the users are not the same, the producer is between the proverbial rock and a hard place. Changes in the public sector include changes in expectations with citizens having become more sophisticated and requiring greater focus on choice and quality in the provision of public services (Osborne and Brown 2005). So, the challenge is how to deal with the issue of customer needs in the purchaser-producer model while at the same time stressing the importance of the customer as subject.

In Figure 4 we have depicted a summary of the elements and dynamics in the regime change in the social and health care sector. Changes on the landscape level have created pressures on the welfare state regime, and the old regime is in the process of destabilising. On the fringe of the regime, niche innovations like the municipal enterprise model examined in this study, have emerged. As witnessed in the form of various clashes regarding innovation in the public sector, what is central is to notice that new models implemented from another contexts are not necessarily successful innovations as such, but one should focus on the process of embedding and applying those models. Therefore, in order to realise the innovation potential present in these clashes and to utilise the "window of opportunity" in times of regime destabilization, innovative practices are needed for bridging the gap between old and new kinds of thinking.

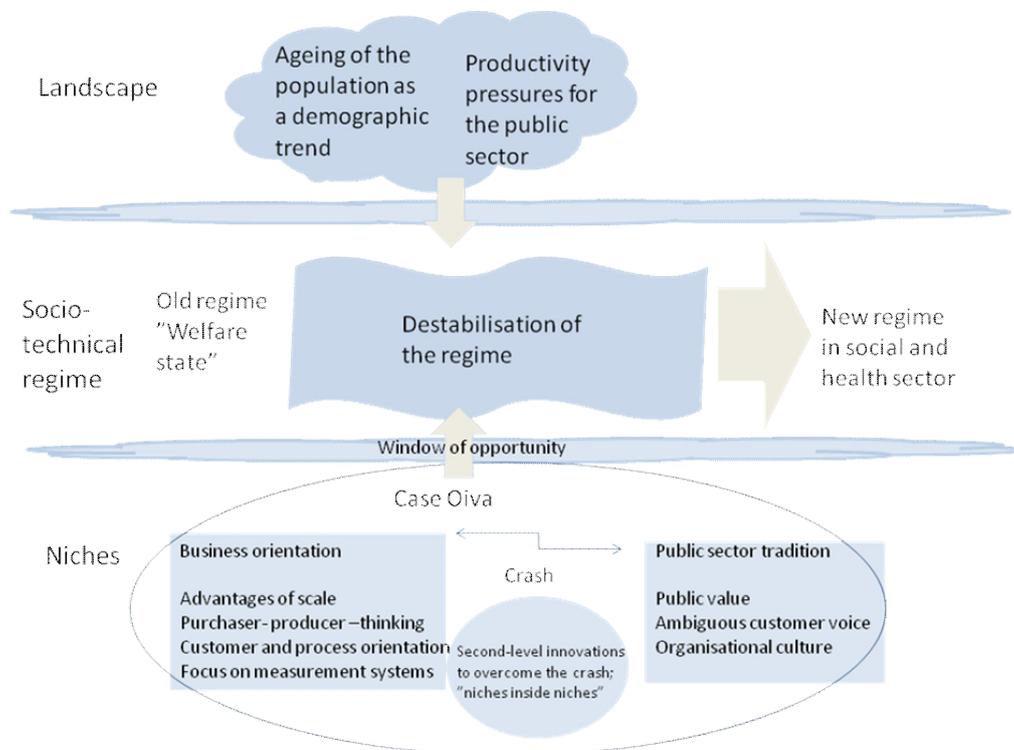


Figure 4. The dynamics of the regime change in the social and health care sector, and the role of case Oiva as a niche innovation in it (adapted from Geels 2002).

If a radical model is trying to break through in a quite established environment, there will be plenty of collisions. It may be difficult to utilise these collisions as innovation potential because diversity and inertia may be too strong. Niches will remain niches apart from the regime, and natural arenas for the clashes will not be created. The new model on the fringe of the destabilising regime reveals the clashes on the micro level (organisational level) mode. These are likely to be easier to manage than those on the regime level. If the management and consolidation are successful, it may have effects also on the regime level. In times of social and health care sector destabilization, niches located on the fringe of the regime are affected by the landscape changes and regime dynamics.

Various kinds of collisions and negotiations are common in the social and health care sector, where innovation processes include a broad range of actors, needs and working cultures. (Capecchi, 1996; Pekkarinen and Harmaakorpi, 2006). The clashes in this process become evident in the examination of the case. Old habits and frames inevitably remain in existence in some way, even though the aim is a new way of

thinking. When the embedding process is scrutinised in detail, diverse demands, clashes, collisions and opposing issues and interests that might be seen as potholes for development if unconsolidated will become evident. There is a serious risk of becoming stuck in these clashes.

However, these clashes are not inevitable barriers for innovation and development, but, instead, they may be extremely fruitful places for innovation. Actually, the idea of networked governance, with multiple voices in networks and partnerships, has also an impact on the production of public value. (see e.g. Hartley 2005; Moore and Hartley 2008). However, this potential can only be exploited if the elements of the clashes are brought to the front and opened up. In overcoming the clashes and in the embedding process of the niches there is a need for “second-level innovations” which will facilitate the adoption and development of the innovation. These can be either innovations changing the ways of *making* new innovations, or innovations changing the ways of *embedding* or implementing new innovations.

Such facilitating innovations would be for instance a model or a way of acting for fitting into the new environment and appearing as meaningful and legitimate to the stakeholders; for instance, a new model for integrating the service processes into the activities of the service users and the work practices of the health care professionals. . As a limitation of this study, it should be noted that the customer and personnel interviews were not included in the data ,but the development work conducted in the case organization with the aim of enhancing bottom-up innovation indicates that the clashes are seen on each level, as well as between levels. The fostering of bottom-up innovation and inclusion of customers and grassroot-level personnel in the development of services can be done by creating arenas for intellectual cross-fertilisation inside the organisation, as well as in the interface of organisations in each phase of the development.

A fundamental question is, then, how these innovative practices take place and how their development can be fostered and facilitated. The idea of *the capital of difference* (a term used by a member of the board in Oiva to describe the versatile composition of the board), or *diversity*, or *distance*, can be utilised here. The role of the different dimensions of distance in innovation activities has been emphasised in recent studies (e.g. Parjanen, Harmaakorpi and Frantsi, 2010). Due to ongoing change processes, distances characterise innovation activities in the public sector particularly well. The homogeneity of the innovating actors increases mutual understanding, but this proximity may also have a negative impact due to lock-in, meaning a lack of openness and flexibility. Distance can take different forms, i.e. cognitive, communicative, organisational, social, cultural, functional or geographical. (Harmaakorpi *et al* 2006; Harmaakorpi *et al*, forthcoming; Parjanen *et al*, 2010.) According to Burt (2004), “structural holes lead good ideas”, which implies that there is huge innovation potential in combining different fields of knowledge. (Johansson, 2004; Dosi, 1988; Pekkarinen and Harmaakorpi, 2006).

Examples of how distances can be brokered are for instance the innovation session method (see Pässilä *et al* 2008; Parjanen *et al*, 2010) or methods of applied theatre (see Pässilä and Oikarinen 2008a; 2008b). The theatre-based methods can be used as sense breaking (deconstruction) and sense making (co-construction) with dramaturgical interventions. (Pässilä and Oikarinen 2008a). These kind of brokerage tools can be used for revealing the clashes (for instance, the holistic problem may be revealed only by looking at the issue from another perspective) and also for finding solutions for the clashes. In Oiva, theatre-based methods have been used in two cases in the change process: during the reorganisation of the public health centre reception services after reorganisations in the emergency duty, and when deepening the co-operation between the basic health services and services for persons with intellectual disabilities. Both these cases got a very favorable reception, and the participants stated that the method helped to gain a holistic understanding of their work, as well as to understand the work of other professional groups. The director and the leading doctor in the organization said that the method revealed important clashes in a delicate way and provided useful knowledge for continuing the development work. (see more Pässilä and Oikarinen, 2008a; 2008b)

We argue that in the phase of regime destabilisation causing various clashes in particular, there is a sore need for these innovations - for embedding, establishing and diffusing the new models. This will help to utilise the window of opportunity and embed the new models into the regime and become a part of the regime change. As Geels (2004) notes, societal transition and regime change develop in a 'coevolutionary' way: they involve changes in technology, knowledge industry structures, as well as user preferences, cultural meanings and infrastructure. This means also that simultaneous and co-effecting changes appear on each level of the multi-level perspective.

8 Conclusions

In this article we have studied the dynamics of the social and health care regime in Finland that has experienced pressures due to the ageing of the population and demands of productivity in public sector services. The destabilisation of the old welfare state regime has created windows for opportunity for niche models, one of which is the focus on this study. Furthermore, the examination shows that the niches are also experiencing and reflecting diverse pressures and aims, but these, however, are easier to master than the regime level turbulence. These clashes are not inevitable constraints on development, but they can also be places for innovation. This collision or clash of old and controversial expectations implies not only the need for new technological, service and organizational innovations in the public sector reform, but also the need for innovative practices 'that facilitate the creation of innovations and the embedding of those innovations in the turbulent environment. This embedding process, again, plays the role in promoting change and restabilisation of the new regime.

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Turvapuhelin vanhuutta rakentamassa

Artikkelissani tarkastelen, miten vanhuutta tuotetaan ja rakennetaan puheissa turvapuhelimista. Lähtökohtanani on turvapuhelimen käyttö vanhuustekona, joka tuottaa ja heijastaa erilaisia yhteiskunnassamme vallitsevia vanhuuskäsityksiä. Tutkin, miten ikääntyneet itse perustelevat turvapuhelimen hankintaa tai hankkimatta jättämistä ja määrittävät turvapuhelimen merkitystä ja tehtäviä elämässään. Tarkastelen puheita sen kautta, miten ikääntyneet puhuvat itsestään toimijoina. Toimijuudella tarkoitan ikääntyneiden puhetta omista valinnan oikeuksistaan ja vaikuttamismahdollisuuksistaan turvapuhelimen käyttöönotossa ja käytössä. Aineistona käytän neljäkymmentä 62–98-vuotiaan ihmisen haastattelua. Osalla haastatelluista on turvapuhelin käytössään, osalla ei. Toimijuuden tarkastelun kautta turvapuhelimen käyttö avautuu luettavaksi lukuisina vanhuustekoina, jotka edustavat erilaisia vanhuuskäsityksiä.

Satu Pekkarinen

Johdanto

Turvapuhelin on yleinen tekninen väline, jota käytetään tukemaan ikääntyneiden ihmisten itsenäistä asumista. Suomessa on tällä hetkellä noin 70 000 hälytyskeskuksiin kytkettyä turvapuhelinta, ja määrä on jatkuvasti lisääntymässä. Turvapuhelinten käyttäjäkunta on yleisesti ottaen melko iäkäästä. Kriteerit kuntien myöntämille turvapuhelimille ovat tiukkoja: käyttäjän tulee olla varsin huonokuntoinen, jotta voi saada julkisin varoin tuetun turvapuhelimen. Yritysten ja säätiöiden turvapuhelinten markkinointi on kohdistettu lähinnä yksin asuville vanhoille ihmisille ja heidän läheisilleen. Käyttäjäkunnan ikärakenne ja tietyille kohderyhmälle suunnattu markkinointi herättävätkin kysymyksen siitä, miten käyttäjät itse ymmärtävät turvapuhelimen osana arkielämäänsä ja miten he puhuvat siitä.

Vanhuutta rakennetaan yhteiskunnassamme eri tavoin, esimerkiksi median ja mainonnan kautta (Leinonen ja Rantamaa 2001). Puhe vanhoista ihmisistä teknologian käyttäjinä on yksi tapa konstruoida vanhuutta: teknologian käyttäjiä pidetään ihanteellisina ikääntyjinä, koska tämä tukee mielikuvaa vanhoista ihmisistä aktiivisina ja itsenäisinä toimijoina (Sankari 2004). Kiinnostavaa on, ihannoidaanko myös apuvälineteknologiaa, joksi turva-

puhelimet luokitellaan. Voiko turvapuhelimella olla käyttäjien puheissa muitakin tehtäviä kuin heikentynyttä toimintakykyä kompensoivan apuvälineen tehtävä? Millaisina vanhuustekoina (Vakimo 2001) nämä tehtävät voidaan nähdä?

Tässä artikkelissa tarkastelen, miten vanhuutta tuotetaan ja rakennetaan ikääntyneiden puheissa turvapuhelimista.¹ Lähtökohtanani on turvapuhelimen käyttö Sinikka Vakimon (2001) termein ”vanhuustekona” ja puhe turvapuhelimesta ”vanhuuspuheena”, jotka molemmat tuottavat ja heijastavat yhteiskunnassamme vallitsevia vanhuuskäsityksiä.² Tutkin ikääntyneiden antamia perusteluja turvapuhelimen hankinnalle tai hankkimatta jättämiselle sekä sitä, miten ikääntyneet itse määrittävät turvapuhelimen merkitystä ja tehtäviä elämässään. Tutkin, miten nämä perustelut ja tehtävät voidaan nähdä vanhuustekoina. Lähtökohdaksi olen ottanut

¹ Kirjoituksen taustalla on meneillään oleva väitöskirjatutkimukseni turvateknologian paikasta ikääntyneen ihmisen elämässä.

² Rintala (2003) toteaa vanhuuskuvan ja vanhuuskäsityksen olevan käsitteinä teoreettisesti erotettavissa toisistaan: vanhuuskuva on lähinnä tieteen antama kuva vanhuudesta, ja vanhuuskäsityksessä tähän tieteen antamaan kuvaan liittyy esimerkiksi subjektiivisia ja arvoihin ja ideologioihin perustuvia käsityksiä. Hän toteaa kuitenkin käsitteiden erottelun olevan veteen piirretty viiva, joten en tässä yhteydessä lähde tarkastelemaan tätä erottelua perusteellisemmin, vaan käytän käsitteitä rinnakkain.

keskeisimmät sosiaalista vanhenemista kuvaavat diskurssit ja niistä nousevan toimijuuden käsitteen, jonka kautta peilaan puhetta turvapuhelimista. Tar kastelen sitä, miten ikääntyneet puhuvat itsestään toimijoina ja miten toimijana oleminen määrittelee tapaa suhtautua vanhenemiseen.

Vanhuuskäsitysten moninaisuus

Kolmas ikä, autonomia ja aktiivisuus vs. neljäs ikä, riippuvuus ja irtaantuminen

Vanheneminen ja vanhuus ovat monikasvoisia käsitteitä. Yhtäältä vanhuus tuo mukanaan erilaisia menetyksiä, kuten toimintakyvyn laskua, ja toisaalta vanhuus ymmärretään seesteisyyden ja erilaisten vapauksien kautena, johon liittyy paljon voimavaroja (esim. Koskinen 2004). Ei ole vain yhdenlaista vanhuuskuvaa vaan useampia, jopa ristiriitaisia käsitteitä vanhuudesta, mikä näkyy vanhoihin ihmisiin liitettyinä ristiriitaisina ominaisuuksina ja esitystapoina (Vakimo 2001, Rintala 2003, Leinonen ja Rantamaa 2001).

Vanhenemiskäsitysten monimuotoisuudet korostuvat myös kolmannelta ja neljänneltä iästä käydyissä keskusteluissa (Laslett 1989, ks. myös Jyrkämä 2001, Karisto 2002, Muhonen ja Ojala 2004) sekä klassisissa yksilötason sosiaalista vanhenemista kuvaavissa aktiivisuus-, jatkuvuus- ja irtaantumisteorioissa (Cumming ja Henry 1961, Jyrkämä 2001). Laslettin tunnetuksi tekemät kolmannen ja neljännen iän käsitteet ovat viime aikoina olleet tutkijoiden mielenkiinnon kohteina. Kolmas ikä on uusi kulttuurinen ilmiö, joka muuttaa kulu tuksen ja vapaa-ajan maisemaa (Karisto 2002). Oletettavasti näin tapahtuu myös teknologiakulu tuksen suhteen. Kolmatta ikää luonnehtivaa peruskäsitteistöä ovat esimerkiksi hyvä terveys, aktiivisuus, autonomisuus, toimintakykyisyys, henkilökohtainen hyvinvointi, itsensä toteuttaminen ja kulluttajuus (Laslett 1989, Gilleard ja Higgs 1998, Jyrkämä 2001, Karisto 2002, Muhonen ja Ojala 2004). Nämä käsitteet kytketään usein myös vanhuuden aktiivisuusteoriaan, jonka mukaan aktiivisuuden ylläpitäminen ja mahdollisten menetysten kompensoiminen jollain aktiivisella tavalla johtavat hyvään vanhenemiseen (Jyrkämä 2001). Aktiivisen vanhuuden ihannoinnilla on pitkä historia: siitä on kirjoitettu jo antiikin Kreikasta ja Roomasta lähtien (Rantamaa 1996).

Neljännessä iässä sen sijaan terveys heikentyy, riippuvuus muista kasvaa ja autonomia kaventuu (Laslett 1989, Jyrkämä 2001, Karisto 2002, Muhonen ja Ojala 2004). Myös ns. vanhuuden irtaantumisteorian mukaan (Cumming ja Henry 1961, Jyrkämä 2001) vanhenemista leimaa irtaantuminen ai-

emmasta elämäntyylistä ja sosiaalisista suhteista. Vanhuus käsitetään olotilaksi, jossa valmistaudutaan kuolemaan, jossa itsemääräämisoikeus heikkenee ja jossa avuttomuus, riippuvuus ja holhottavuus yleistyvät (Cumming ja Henry 1961, Rintala 1999).

Kohti toimijuuden käsitettä vanhuuden tarkastelussa

Edellä kuvatut näkökulmat yhdistetään usein yksilön sopeutumiseen vanhenemiseensa ja tästä seuraavaan onnistuneeseen vanhenemiseen (successful ageing) (Baltes ja Baltes 1990, Jyrkämä 2001). Vanhuuskäsitysten dikotomisat tarkastelutavat ovat kuitenkin monesta syystä ongelmallisia. Vanhuuskuvat eivät ole vakaita ja pysyviä, vaan niitä luodaan erilaissa vuorovaikutustilanteissa. Vanhuusteoriat ovat myös itsessään tietynlaisia vanhuuskuvia. Esimerkiksi kolmannen iän käsitettä on kritisoitu juuri siitä, että se asettaa normeja ja paineita hyvälle vanhenemiselle (Bury 1995) ja tulee samalla korostaneeksi vanhenemiseen liittyviä negatiivisia stereotyyppioita (Jyrkämä 2001, Karisto 2002).

Myöskään neljänteen ikään liitetty riippuvuus ei ole automaattinen seuraus biologisesta vanhenemisprosessista, vaan se on suurelta osin sosiaalisesti tuotettua, joko opittua tai itse valittua (Baltes ja Cartensen 1999). Irtaantuminen joistakin yhteiskunnan osa-alueista ja kiinnittyminen toiseen voi olla tarkkaan harkitun toiminnan tulosta. Sosioemotionaalisen valinnan teorian (Baltes ja Cartensen 1999) mukaan sosiaalisten kontaktien vähäminen vanhuudessa heijastaa aktiivista valintaprosessia, missä läheiset ihmissuhteet korostuvat ja etäisemmät suhteet jäävät vähemmälle (Baltes ja Cartensen 1999). Riippuvuuteen ja avun tarpeeseen perustuvat ikäjaottelut ovat kyseenalaisia myös siksi, että avun tarve vaihtelee tilanteesta toiseen ja kaikki ihmiset ovat tavalla tai toisella toisistaan riippuvaisia (Tedre 2003).

Jyrkämä (1995, 2001) ehdottaakin näitä ”vanhuusteorioita” tarkasteltaviksi pikemminkin vaihtoehtoisina toimintastrategioina kuin teorioina, jotka sanovat jotain yleispätevää tai ajatonta vanhenemisestä. Teoriat voidaan hänen mukaansa ymmärtää toimintalogiikkana, jota ihmiset toteuttavat – tai sitten eivät toteuta – vanhetessaan. Teorioita on arvosteltu myös siitä, että ne eivät näe kohteinaan olevia ihmisiä aktiivisina, tavoitteellisina toimijoina, vaan keskittyvät ensisijaisesti ulkoiseen käyttäytymiseen ja sen muutoksiin. Huomiota tulisikin kiinnittää sosiaalisen vanhenemisen dynaamisempaan tarkasteluun, jossa ikääntyneet ihmiset

nähtäisiin toimijoina ja valintojen tekijöinä (Jyrkämä 2001).

Jyrkämän tapaan näen sosiaalisen vanhenemisen teorit vaihtoehtoisina hahmotustapoina ja vanhuuspuheina, joita tuotetaan ja luodaan esimerkiksi turvapuhelinta koskevan teknologiapuheen yhteydessä. En kuitenkaan pyri pääsemään käsiksi esimerkiksi puhujan käyttämään kokonaisvaltaiseen, elämäntyyleihin ja arvoihin perustuvaan ”vanhenemislogiikkaan”, vaan pikemminkin tilannekohtaiseen logiikkaan, joka tulee esiin puhetilanteissa. Jyrkämän (2001) ehdotus huomion kohdentamisesta yleispätevien vanhuuskuvien tutkimisen sijasta toimintaan kannustaa tarkastelemaan sosiaalista vanhenemistä *toimijuuden* käsitteen kautta, mikä mahdollistaa edellä kuvatun kahtiajaon ylitämisen. Ikääntynyt ihminen voi avuntarpeesta huolimatta kokea olevansa itsenäinen ja elämäänsä koskevia päätöksiä tekevä toimija. Toimijuus tarkoittaa siten muutakin kuin aktiivista, ulkoisesti havaittavaa toimintaa, se merkitsee esimerkiksi kokemusta elämänhallinnasta (Jyrkämä 2001). Rajoituneen toimintakykynsä vuoksi säännöllistä apua tarvitsevat ihmiset voidaan nähdä itsenäisinä toimijoina, jos he voivat tehdä valintoja siitä, millaista apua he saavat, missä sitä annetaan ja kuka sitä tarjoaa, vaikka he eivät olisikaan autonomisia ja riippumattomia käsitteiden kapeassa merkityksessä. On olennaista tähdentää, että ikäihmiset ovat enemmän tai vähemmän tavoitteellisia toimijoita, joilla on toiminnastaan sekä sen seurauksista tietoa ja jotka kykenevät eri tavoin myös perustelemaan toimintaansa ja antamaan sille merkityksiä (Jyrkämä 2001). Kyse on valinnanmahdollisuuksista, jotka ylittävät jäsenyykset kolmannelta ja neljännestä iästä, aktiivisuudesta ja irtaantumisesta sekä autonomiasta ja riippuvuudesta. Toimijuuden tarkastelu suuntaakin katseen niihin tekoihin, joilla ikääntynyt itse määrittelee omaa vanhenemistään. Näitä tekoja voidaan kutsua vanhuusteoiksi.

Vanhuusteot ja vanhuuspuheet

Biologinen vanheneminen on väistämätön ja jatkuva prosessi, mutta iän sosiaalisista ja kulttuurisista merkityksistä neuvotellaan uudelleen jokapäiväisissä vuorovaikutustilanteissa. Vanhuutta tuotetaan niin jokapäiväisissä toiminnoissa ja elämäntilanteissa kuin ikääntymistä koskevassa tutkimuksessa. Puhuessaan *vanhuusteista* Sinikka Vakimo (2001) tarkoittaa sellaisia sosiaalisissa vuorovaikutuksissa tehtyjä toimintoja, joilla tuotetaan omaa tai toisten korkeaa sosiaalista ikää tai joilla määritetään itsensä tai toiset kuuluviksi ikääntyneiden kategoriaan.

Sosiaaliin ikin ankkuroituvia identiteettejä konstruoidaan erilaisin teoin koko elämän ajan. Yksilö rakentaa vanhenemistään valinnoillaan (Jyrkämä 2003) ja ottaa kantaa vanhenemiseensa näiden valintojen avulla. Yksi helpoimmin havaittavista vanhuusteista on pukeutuminen – millaisen pukeutumisen katsotaan olevan sopiva minkäkin ikäiselle (Featherstone ja Hepworth 1991). Vanhuustekona voi pitää myös arkielämän suuntaamista siten, että osallistuu sellaisiin sosiaalisiin toimintoihin, joiden arvelee kuuluvan ikääntyneiden elämään ja välttelee sellaisia paikkoja ja tilanteita, joissa koetaan liikuttavan ikääntyneelle epäsovelialla alueella (Vakimo 2001). Esimerkiksi se, mitä voisi tehdä eläkkeelle jäädessään, saattaa törmätä kulttuurin ikäkriteereihin.

Vanhuusteiksi voidaan lukea myös erilaisten liikkumista helpottavien apuvälineiden, kuten pyörätuolien, kävelykeppien, kenkien liukusteiden ja rollaattorien käyttö (Vakimo 2001, Becker 1994, Leinonen ja Rantamaa 2001). Apuväline- ja turvallisuutta lisäävän teknologian, kuten turvapuhelimen sellaisena kuin sitä markkinoidaan, käytön voidaan katsoa olevan vanhuusteko, joka korostaa myöhäisvanhuuden avun tarvetta. Muunlaisen teknologian, kuten tietokoneiden, matkapuhelimien, pelikonsolien, sykemittarien, voidaan yleistymisestäään huolimatta katsoa kuuluvan aktiivisten nuorten ihmisten elämään. Jos ikääntynyt käyttää tällaisia laitteita, tämä näyttäytyy julkisessa puheessa usein ”käänteisenä” vanhuustekona: vanha ihminen käyttää näitä ”iästään huolimatta” (Sankari 2004). Korkeaan ikään ja apuvälineiden käyttöön liitetty mielikuva turvallisuushakuisuudesta ja riippuvuudesta tulee esiin Leinosen ja Rantamaan (2001) tekemässä huomiosta, että turvallisuus tuotiin korostuneesti esiin ikääntyneille suunnatussa mainonnassa. He havaitsivat myös, että ikääntyneille suunnatun lehden rollaattorimainosten henkilökuva oli passiivisempi kuin saman lehden automainosten.

Vanhuutta rakennetaan diskursiivisesti myös puheen avulla, mitä Vakimo (2001) nimittää *vanhuuspuheeksi*. Sen avulla tuotetaan omaan ikään sitovaa identiteettiä. Vanhuuspuheella rakennetaan Vakimon mukaan omia ikäidentiteetin rajoja, mutta sillä voidaan myös kommentoida yleisiä vanhenemisennakkoluuloja. Julkisessa vanhuuspuheessa on esimerkiksi tavallista käyttää kiertoilmaisuja, joiden avulla piilotetaan ja hämärretään vakiintuneita vanhuuskuvia. Vanhoja ihmisiä kutsutaan ikääntyviksi, senioreiksi, harmaiksi pantteureiksi, ikinuoriksi, vapaaherroiksi, aikuisiksi naiseksi jne. (Vakimo 2001, Karisto 1997.)

Turvapuhelin ja toimijuus vanhuudessa

Turvapuhelin ja toimijuus

Anthony Giddens (1984) kytkee toimijuuden käsitteen valtaan ja kykyyn ”toimia toisin”, vaikuttaa tai olla vaikuttamatta maailman tapahtumiin. Otan tämän määrittelyn lähtökohdakseni ja tarkastelen turvapuhelimen hankintaa ja käyttöä koskevaa puhetta koettujen valinnan- ja ”toisin toimimisen” mahdollisuuksien kautta. Puhun ei-toimijuuden sijasta heikosta toimijuudesta, sillä toimijuus ei missään vaiheessa katoa, vaan kyse on esimerkiksi siitä, että turvapuhelimen hankintaa ja käyttöä koskevaa päätöksentekoa luovutetaan omaisille tai terveydenhuolto- ja turvapuhelinstituutiolle. Toimijuutta saattaa rajoittaa myös sosiaalinen ympäristö normeineen ja sopivuussääntöineen.

Aineisto ja lähestymistapa

Aineistoni koostuu pääosin turvapuhelimen käyttäjien teemahaastattelusta. Haastattelin vuoden 2002 touko- ja joulukuun välillä yhdessä tutkimusapulaisen Marika Kivisen (nykyisin Marika Rauma) kanssa neljäkymmentä 62-98-vuotiasta ihmistä kodeissa ja palvelutaloissa eri puolilla Suomea. Haastattelut valikoituivat ja heidät tavoitettiin Teknillisen korkeakoulun Lahden keskuksen tutkimusprojektiin osallistuneiden yhteistyöorganisaatioiden kautta. Haastateltuihin kuului 24 perinteisen turvapuhelimen käyttäjää, viisi hyvinvointirannekkeen³ käyttäjää, kaksi satelliittipaikantavan turvapuhelimen testikäyttäjää sekä yhdeksän ikääntynyttä, joilla ei vielä ollut turvapuhelinta käytössään. Haastatelluista 29 oli naisia ja 11 miehiä. Haastateltujen joukko oli varsin heterogeeninen niin asuinympäristön, terveydentilan, elämäntilanteen kuin turvapuhelimen käyttökokemustenkin suhteen.

Haastattelussa kysyimme turvapuhelimen ja –palvelun toimivuudesta, tarpeellisuudesta, käyttötilanteista ja käyttöönoton sujumisesta. Keskustelimme vanhenemisesta, asumiseen ja arkielämän sujumiseen liittyvistä seikoista sekä turvallisuudesta ja mahdollisista peloista. Kartoitimme myös ihmisten suhtautumista uuteen turvateknologiaan, joka mahdollisesti sisältää entistä enemmän valvontaa. Niiltä haastateltavilta, joilla turvapuhelinta ei vielä ollut, kysyttiin muun muassa tietämystä, tuntemusta ja mielikuvia turvapuhelinlaitteista ja –palveluista sekä näkemyksiä tilanteesta, jossa niitä voisi kuvitella hankkivansa.

³ Hyvinvointiranneke on turvapuhelinjärjestelmä, joka monitoroi käyttäjänsä terveyttä ja hälyttää automaattisesti, jos järjestelmä havaitsee merkittävän muutoksen käyttäjän aktiivisuustasossa.

Lähestymistapa aineistoon on konstruktionistinen ja diskurssianalyttinen, niin että puhe ja kieli nähdään todellisuutta – tässä siis vanhuutta ja ikää – tuottavana. Tutkimukseni kohteena ovat turvapuhelinpuheessa tuotettavat vanhuusteot, ja tämän vuoksi tarkastelen nimenomaan haastateltavien puhetaivoja enkä pyri pääsemään käsiksi puheiden takana oleviin mielipiteisiin tai todellisuuteen. Ihmiset puhuvat suhtautumisestaan turvapuhelimeen eri tilanteissa ristiriitaisesti, ja tämän vuoksi myös ihmisten tyypittely näkökantojensa mukaan osoittautui mahdottomaksi tehtäväksi. Puheiden sisäinen ristiriitaisuus kuvastaa osaltaan yhteiskunnassamme vallitsevaa ambivalenttia käsitystä vanhuudesta (ks. esim. Vakimo 2001, Rintala 2003).

Puheen analysoinnin kautta pyrin avaamaan kuvastoa, jolla vanhuutta hahmotetaan ja rakennetaan. Kävin litteroituja haastatteluja läpi tarkastellen, millaisia ikään liittyviä merkityksiä turvapuhelimesta tuotetaan ja miten ikääntyneet määrittävät itseään toimijoina. Tarkastelin turvapuhelimen hankinnassa ja käytössä koettuja vaikutus- ja ”toisin toimimisen” mahdollisuuksia, ohjenuoranani Giddensin näkemys toimijuudesta mahdollisuutena vaikuttaa maailman tapahtumiin. Luokittelin litteroitua aineistoa sillä perusteella, katsoinko tekstin edustavan vahvaa vai heikkoa toimijuutta turvapuhelimen hankinnassa tai käytössä. Vahvaan toimijuuspuheeseen luokittelin ilmaisut, joissa korostuu itsenäinen päätöksenteko, halu päättää omasta elämästään ja turvapuhelimen käytöstä. Heikkoon toimijuuteen kuuluvat puolestaan ilmaisut, jotka kuvaavat ainakin osittain toisten päätösten varassa olemista, päätösten tekemistä sukulaisten tai instituutioiden toimijaan kohdistaman sosiaalisen paineen alaisena sekä ilmaisut, jotka kuvaavat turvapuhelimen hankintaa astumisena vanhuuden heikkouteen, toisista riippuvuuteen ja toimijuuden menettämiseen.

Vahvan toimijuuden puhe turvapuhelimen käytössä

Turvapuhelimen käyttö on toimijuutta korostava ja sitä tuottava vanhuusteko esimerkiksi tilanteessa, jossa käyttäjä on itse motivoitunut teknologian käyttöön, tehnyt itse aloitteen sen hankkimiselle ja käyttää sitä oman harkintansa ja omien tavoitteidensa mukaan. Modernit teknologiat ovat mahdollistaneet turvapuhelinten mobiililiratkaisuja, jotka mahdollistavat käyttäjänsä paikantamisen myös kodin ulkopuolella. Tässä tehtävässä turvapuhelin on käyttäjänsä aktivoiva, jolloin se on *aktiivisuutta korostava ja vanhuuden heikkoutta ja passiivisuutta vastaan taisteleva vanhuusteko*. Turvapuhelin voi rohkaista vapaaehtoiseen riskinottoon, se

voi mahdollistaa sellaisiin aktiviteetteihin ja ikänormeja rikkovaan ikäleikkelyyn (Airaksinen 2002, ks. Karisto 2002) osallistumisen, joihin ilman turvapuhelinta ei ehkä olisi uskallusta.

Turvapuhelimella onkin liittymäkohtia työpaikkojen turvallisuuden ja toisaalta liikunnan ja vapaa-ajan kasvaviin markkinoihin. Paikannusominaisuuksien kehittyessä tulevaisuuden turvapuhelin ei turvaa ainoastaan kotona ja työpaikalla, vaan on viestintäväline kadulla, marjametsässä, hiihtolenkillä, vaellusretkellä, missä tahansa. Haastateltavani kertovat, että he ovat halukkaita kulkemaan kotinsa ulkopuolella, mutta pelkäävät kaatumista, sairaskohtausta tai väkivaltaa. Monet ovatkin hankkineet tavallisen matkapuhelimen ”turvapuhelimeksi”, mutta myös paikantavista turvapuhelimista puhtaan innostuneeseen sävyyn:

No sehän ois Herran ihmeessä mikä sen hienompaa – jos jostakin joku mies hyökkää taikka noita nykyään nuo naisetkin jo hyökkäävät, niin mitä siinä olis ku tämmönen olis ja sais sanottu että tulkaa apuun. (87-vuotias nainen, perinteinen turvapuhelin.)

Myös satelliittipaikantavan turvapuhelimen testikäyttäjät kertoo paikannustekniikan hämmästyttäneen positiivisesti teknologisenä edistyksenä:

No oli se niinkun ihmeellistä. Kun se satelliittien kautta paikallistettiin ja kun se minuuttien perusteella osasi sanoa, että mihin minä menen ja oikeasti sen nopeuden mukaan, että kuinka nopeaan minä nyt liikun paikasta toiseen. Kyllähän se tietysti tekniikka on pitkällä. (65-vuotias mies, gps-puhelimen testihenkilö.)

Vahvaa toimijuutta heijastelee osaltaan myös tapa käyttää turvapuhelinta. Ihmisten herkkyyks hälytyksen tekoon vaihtelee, ja käyttäjä saattaa esimerkiksi itse määritellä, millaisessa tehtävässä laite toimii hänen elämässään, riippumatta palvelutarjoajien asettamista säännöistä.⁴ Tietoinen ohjeiden vastainen toiminta korostaa osaltaan käyttäjän kokemusta toimijuudestaan ja vaikutusmahdollisuuksistaan, kuten seuraava nainen kertoo:

Niin minäkin viime yönä kun hälytin joskus kahdentoista aikaan ja sanoin, että onko nyt yö vai päivä, niin sanoivat, että nyt on keskiyö. Mi-

nä sitten katoin kelloon ja [...] minä sanoin, että hyvä, että ei mulla hätää, että kiitos. [...] niin sanovat, että elä ihmeessä paina, että sulta lasku otetaan, mutta eihän ne sitä tosissaan ota, kun se on kunnan omistama. (88-vuotias nainen, perinteinen turvapuhelin.)

Turvapuhelimen käyttäjä myöntää itse soittelevansa välillä turhaan, koska hänelle itselleen ei tule hälytyksistä tai käynneistä kuluja. Palvelutarjoajien toiveet ja asiakkaiden toimintatavat eivät välttämättä aina kohtaa, ja asiakkaat myös leikittelevät ja kokeilevat rajojaan hälytysten teossa. Vanhuutektona tämä on *kommentointia kilttiä ja palvelujärjestelmälle kuuluaista vanhuutta vastaan.*

Toisessa ääripäässä on tilanne, jossa turvapuhelinpalvelun asiakas kertoo sinnittelystä hälytyksen välttämiseksi, vaikka hälytyksen tekoon olisi aivan perusteltu syy:

Läksin yöllä vessaan tämän kärrin kanssa ja sitten se osui tuohon kulmaan ja just siinä kun tuota vessan ovee rupee aukasemaan ja kun tämä käsi on kipeä, niin minä en saanut niin äkkiä tuota vessan ovea kokonaan, että olis nämä kärrit siihen eteen saanut. Minä kaaduinkin jälleen tuonne vessan lattialle ja sinne taas tuo piä kävi. Kun en meinannut päästä sieltä pois, en millään ja aattelin, kun yö oli siinä kahden maissa, että ketään en häiritse. Jos piäsen täältä pois, niin hyvä on. Jos en pääse, niin sitten sieltä soitatan. [...] Ite pääsin. Pitkin tätä lattiaa vaan, että en tämän [rollaattorin] varaan voinut nousta, vaan ihan kömpimällä tuolla pitkin lattiaa sitten. (98-vuotias nainen, perinteinen turvapuhelin.)

Turvapuhelimen käyttäjä on tässä tehnyt itse vallinnan olla painamatta turvapuhelinnappia, ja yrittää pärjätä ilman apua. Yksin, ilman apua selviämisen korostaminen voidaan tulkita *vanhuuden riippuvuutta vastaan kommentoivaksi vanhuusteoksi.*

Turvapuhelimen käyttäjissä on paljon sellaisia, joilla puhelin on ollut jo vuosia käytössä ilman tarvetta avun kutsumiselle. Luopua siitä ei kuitenkaan haluta, sillä eihän koskaan tiedä, milloin sitä tarvitsee. Modernia yhteiskuntaa on kuvattu niin sanottuna riskiyhteiskuntana (Beck 1992), jossa eriasteisia epävarmuustekijöitä pyritään saamaan hallintaan. Globaalien riskien yhteiskunnallisen hallinnan lisäksi myös yksilölliset epävarmuustekijät pyritään saamaan kontrolliin erilaisten elämänhallinnallisten keinojen avulla. Kun erilaisia epävarmuustekijöitä on elämässä yhä enemmän, on hallittava sitä, mitä hallittavissa on, ja usein tämä palautuu lähelle yksilöä, kuten omaan kehoon ja sitä kaut-

⁴ Palvelutarjoajat antavat usein tarkkojakin ohjeita siitä, millaisissa tilanteissa on ”sallittua” tehdä hälytys. Eräässä turvapuhelinhälytysten seurantatutkimuksessa (Molander 2003), kävi ilmi, että turvapuhelinlaitteiston tekniikkaan liittyvät soitot sekä ns. turhat yhteydenotot muodostivat 80 % kaikista hälytyskeskukseen tulleista hälytyksistä. Turhiin yhteydenottoihin katsotaan kuuluvan hälytysnapin painaminen vahingossa, puheseuran haluaminen tai kellon kysyminen.

ta myös terveyden hallintaan (Giddens 1991). Myöhäismodernin riskiajattelussa, johon liittyy syyllisyys ja kontrolli, riskejä voidaan ainakin jossain määrin kontrolloida yksilöllisten valintojen avulla (Tulloch ja Lupton 2003). Turvapuhelin voi osaltaan ratkaista ristiriitaa modernin yhteiskunnan hallinnan vaatimusten ja heikkenevän toimintakyvyn aiheuttaman epävarmuuden välillä. Eräs nainen kertoo riskinhallinnasta näin:

Minä haluan, että minua ei löydetä lattialta kuolleena, vaan että mä pystyn ilmoittamaan, että täällä mä nyt olen, tulkaa hakemaan. (84-vuotias nainen, perinteinen turvapuhelin.)

Elämänhallinnan käsitteeseen liittyy myös ajatus ihmisen mahdollisuudesta hallita kuolemaa (Järvikoski 1996). Turvapuhelimet, samoin kuin muut ihmisen turvallisuutta parantavat toimenpiteet, ovatkin elämänhallinnan sijasta oikeastaan kuoleman hallintaa ja siirtämistä tuonnemmaksi (ks. Bauman 1992). Tämä liittyy Baumanin ajatuksen siitä, kuinka modernissa yhteiskunnassa kuolemaa yritetään käsitellä näkemällä se yksittäisinä vältettävissä olevina kuolemansyinä: sairauksina ja muina terveysuhkina. Ihminen ei vain kuole, hän kuolee *johonkin*, mahdollisesti itse aiheuttamaansa laiminlyöntiin (Bauman 1992). Tämän tulkinnan mukaan turvapuhelimen hankkimatta tai käyttämättä jättäminen voidaan nähdä henkilökohtaisena laiminlyöntinä, mahdollisen kuoleman aiheuttajana. Turvapuhelin näyttäytyy siis yksilöllisenä valintana, elämän- ja kuolemanhallintakeinona. Vanhuustekona tämä tarkoittaa *vanhan ihmisen oman vastuun korostamista terveydestään ja elämästään*. Tässä puheessa luottamusta ei siirretä esimerkiksi sukulaisille tai asiantuntijoille, mihin tulen seuraavassa.

Heikon toimijuuden puhe turvapuhelimen käytössä

Heikossa toimijuudessa on kyse ikääntyneen ihmisen toiminnan vaihtoehtojen kaventumisesta. Heikko toimijuus ei tarkoita välttämättä sitä, että toimijuudesta olisi jouduttu kokonaan luopumaan, vaan heikossa toimijuudessa on kyse rajoittuneista mahdollisuuksista ”toimia toisin” (Giddens 1984). Toisin toimimista rajoittavia tekijöitä on Giddensin mukaan kolmenlaisia: materiaalisia, sanktioihin perustuvia ja rakenteellisia. Materiaalisilla rajoitteilla Giddens tarkoittaa fyysisiä, luonnonvoimien kaltaisia rajoituksia, joita voivat olla esimerkiksi ruumiin asettamat rajoitukset. Sanktioihin perustuvassa rajoitteessa on kyse vallasta, jonka muodot voivat vaihdella väkivallan käytöstä ja sillä uhkaamisesta lievään paheksuntaan. Sosiaalisen paheksunnan

välttäminen ja vastaavasti hyväksynnän hakeminen esimerkiksi tavassa käyttää turvapuhelinta voi olla yksi vapaata turvapuhelimen käyttöä rajoittava tekijä. Rakenteellisiin tekijöihin perustuvassa rajoitteessa on giddensiläisittäin kyse yhdestä *toteutettavissa olevasta* vaihtoehdosta suhteessa tiettyihin päämääriin ja motiiveihin: ihmisellä on periaatteessa vaihtoehtoja, mutta toimijuuden rajoitteet perustuvat esimerkiksi rangaistuksen pelkoon tai institutionaaliseen järjestykseen. Giddens käyttää tästä esimerkkinä kapitalistista yhteiskuntaa, jossa työntekijän on ”pakko” myydä työvoimaansa. (Giddens 1984.)

Turvapuhelimen käyttöönottoon ja käyttöön liittyy joskus elementtejä, jotka hämärtävät käyttäjän asemaa itsenäisenä, valintoja tekemänä toimijana. Näin on esimerkiksi tilanteessa, jossa turvapuhelimen hankintasuosituksen tai jopa -päätöksen on tehnyt joku toinen kuin käyttäjä itse, kuten sukulainen, lääkäri, kotipalvelun työntekijä tai palvelutalon henkilökunta. Turvapuhelimen käyttäjä luovuttaa toimijuuttaan näille tahoille ja myös laajemmin heidän edustamilleen asiantuntijainstituutioille. Jokseenkin samaa kuvaa luovutetun autonomian (delegated autonomy) käsite (Collopy 1988), millä tarkoitetaan sitä, että yksilö hyväksyy valtuuttamisensa ihmisten tekemät häntä koskevat päätökset ja toimet. Tällaisessa tilanteessa saattaa piillä väärinymmärryksen vaara esimerkiksi sen suhteen, mitä kaikkea valtuutuksen on sovittu koskevan (Collopy 1988). Toimijuutta voi luovuttaa tai jakaa eriasteisesti. Turvapuhelimen käyttäjä on usein monien keskeisten päätösten tekijä hänen luottaessaan sukulaisiin tai muihin auktoriteetteihin. Toimijuuden luovuttamisessa ja sen jakamisessa toimijuuden ”omistajuuden” määrittely onkin usein vaikeaa. Tämä kuvastuu esimerkiksi siinä, että jää usein epäselväksi, kuka lopulta on turvapuhelinasiakas – käyttäjä itse, hänen omaisensa vai esimerkiksi palvelutalon henkilökunta, jonka työhön turvapuhelin vaikuttaa (ks. Kivinen 2003) – ja kenen tuottamista vanhuusteista onkaan tällöin kyse.

Sukulaisten rauhoittaminen on yksi keskeinen syy turvapuhelimen hankintaan, ja on hyvin tavallista, että innokkaampia turvapuhelimen puolesta puhujia ovat nimenomaan ikääntyneen ihmisen omat lapset.

Pojat halusivat tämän, heidän takiaan minä tämän hankin, kun minä olen yksin kotona. (94-vuotias nainen, perinteinen turvapuhelin.)

Vanhuustekona on tässä *odotusten mukainen turvallisuushakuisuus: turvallisuudentunteen tuottaminen ympäristölle*. Tämän vanhuusteon taustalla on ajatus siitä, että yksin asuvalla vanhalla ihmisellä ”kuuluu” olla turvapuhelin tai muuta apua käy-

tettävissään. Toisaalta turvapuhelimen käyttöä perustellaan myös sillä, että vanha ihminen ei halua olla taakaksi sukulaisilleen:

Se on turvallinen sillä lailla niin, että tietää miten jos tulee joku sydänkohtaus niin että voi saada apua. Niin ei tarvi sukulaisia vaivata. (87-vuotias nainen, perinteinen turvapuhelin.)

Sukulaisista ja naapureista ei välttämättä ole kuitenkaan tositilanteessa apua, heidän vaivaamisensa tuntuu kiusalliselta tai heidän ei haluta tietävän, jos on jotain hätää. Näin ollen turvaa haetaan turvapuhelinpalvelun kaltaiselta instituutiolta, ja tällöin myös toimijuutta ja vastuuta luovutetaan instituutioille. Giddens (1991) toteaa luottamuksen sukulaisiin korvautuvan jälkitraditionaalisessa yhteiskunnassa luottamuksella abstrakteihin systeemeihin. Traditionaalisessa maailmassa paikallisyhteisö ja sukulaisuus olivat kaksi auktoriteetin ja luottamuksen lähdettä, mutta modernissa yhteiskunnassa traditionaalisesta auktoriteetista tulee vain osa pluralisoitunutta eksperttisyysteemiä (Giddens 1991). Instituutiona turvapuhelinpalveluverkostot ovat usein luonteeltaan monitoimijaisia ja kompleksia, sisältäen paljon vakiintumattomia menettelytapoja (Melkas 2004), mikä monimutkaistaa toimijuuden määrittelyä yhä entisestään.

Modernille yhteiskunnalle ominainen biomedikaalisiaatio on osaltaan määrittelemässä hyvää vanhenemista ja vaikuttaa yksilöiden kykyyn tehdä terveyteen liittyviä päätöksiä (Becker 1994). Luottamus ekspertteihin suositusten antajina, ”viisaammat tietävät mikä on minulle parasta” -logiikkaa noudattaen, korostuu modernissa epävarmuuksien maailmassa (Giddens 1991). *Ikääntyneen nojaaminen asiantuntijoihin ja auttamisinstituutioihin* perheen sijasta voidaan nähdä modernille yhteiskunnalle ominaisena vanhuustekona.

Toimijuus hämärtyy entisestään, jos käyttäjä ei ole toimijuuden luovuttamisprosessista tietoinen eli ei esimerkiksi tiedä, kuka turvapuhelimen on hankkinut. Tällainen tilanne on joissakin palvelutalouksissa, joissa turvapuhelin kuuluu osaksi kokonaispalvelupakettia. Käyttäjät eivät välttämättä tiedä, paljonko turvapuhelin maksaa ja kuka sen kustannuksista vastaa. Myös itse käyttötarkoitus saattaa jäädä epäselväksi. Välillä oli kovin vaikea saada selvää halukkuudesta turvapuhelimen käyttöön, koska siitä puhuttiin varsin välinpitämättömästi:

En minä muista mistä tämä on edes tullut. Täälläkö se nyt on tullut, kun minä tänne muutin. Niin kai. (66-vuotias nainen, hyvinvointiranneke.)

Se laitettiin vaan. (71-vuotias nainen, hyvinvointiranneke.)

Kun käyttäjä ei hämmästele ranteeseensa laitettua turvaranneketta eikä ole juuri kiinnostunut sen olemassaolosta, kyse on omaa elämänsä koskevan välinpitämättömyyden ja palvelujärjestelmään luottamisen vanhuusteosta, joka korostaa passiivista ja muiden ohjailtavana olemisen vanhuuskuvaa.

Toimijuuden luovuttamista järjestelmälle kuvaa osaltaan turvapuhelimen käyttö tiukasti palvelutarjoajan tarkoittamassa tehtäväsöä – kun pohditaan tarokkaan, milloin on ”luvallista” tehdä hälytys ja kärsitään syyllivyydentunugesta, jos saa huomautuksia ”vääränlaisesta” käytöstä, kuten seuraavalle naiselle oli tapahtunut:

No minulle sanottiin kerran, kun minulla oli puolukoita ja minä pudotin niitä pitkin lattiaa, niin silloin minä painoin, niin silloin Jaana [hoitaja], että kuule tämä on turhaa painamista, että ei Elvi, tätä ei saa tehdä. Antoi toruja minulle.⁵ (81-vuotias nainen, hyvinvointiranneke.)

Vanhuustekona edellä mainittu viestii *kiltteyden ja palvelujärjestelmälle kuuliaisuuden vanhuusteosta*. Sen lisäksi, että käyttäjät alistuvat nöyrästi palvelutarjoajan ohjeisiin, he eivät myöskään välttämättä osaa vaatia hyötykäyttöön tarkoitettua laitteelta muuta kuin teknistä toimivuutta ja palvelun luotettavuutta. Käyttäjät hyväksyvätkin usein hyödyllisyyden nimissä epämieluisiksi koettuja ominaisuuksia, kuten tietyt säännöt, lisääntyneen valvonnan, riippuvuuden tunteen tai laitteen epämielittävän, leimaavankin ulkonäön. Esimerkiksi kauneutta ja hyödyllisyyttä kuvattiin toisensa poissulkevina:

No eihän tämä nyt kaunein ole mut ei kai tämä nytten mikään – en minä tiä mikä siinä sitten oli niin että eihän tämän ole tarkoitus mikskään kauneusesineeksi. (87-vuotias nainen.)

No eihän tämä tarvi mikään kaunis olla. Samahan se on, ei minulla ole mitään vaihtoehtoja. Se on erikseen noille nuorille, jos tarvisi. (81-vuotias nainen, hyvinvointiranneke.)

Viimeksi esitetystä sitaatista haastateltava liittää kauneuden pitämisen merkityksettömänä ikään ja antaa ymmärtää, ettei ulkonäkö hänen ikänsä vuoksi ole tärkeä. Vanhuustekona näyttäytyy tässä turvapuhelimen käytännöllisyyden ja toimivuuden korostaminen esteettisyyden sijasta.

⁵ Nimet muutettu.

Turvapuhelinasiakkaana oleminen voidaan myös itsessään nähdä vanhuustekona, vanhuuden rajapyykin ylittämisenä. Suhteellisen terveet ja hyväkuntoiset ihmiset, jotka eivät vielä olleet halunneet hankkia turvapuhelinta, viittasivat usein siihen, että turvapuhelimen käyttö mielletään heikkoa toimijuutta kuvaavaksi vanhuusteoksi, jolla on konnotaatioita neljänteen ikään, riippuvuuteen ja rajoittuneeseen autonomiaan:

Me emme tietysti ole ihan vielä siinä tilanteessa. (69-vuotias mies, ei turvapuhelinta.)

Sitten kun tulee semmoiseksi, että tarvii täällä, niin se on ihan kätevä. (76-vuotias nainen, ei turvapuhelinta.)

En [ole harkinnut turvapuhelimen hankkimista]. En ainakaan niin kauaa kuin mä vähänkin ymmärrän ja pystyn itteni hoitamaan. (62-vuotias mies, ei turvapuhelinta.)

Heikossa toimijuudessa on siis kyse rajoittuneesta mahdollisuudesta toimia toisin ja vaikuttaa maailman tapahtumiin. Edeltävistä turvapuhelinasiakkaaksi ryhtymistä koskevista lainauksista käy ainakin epäsuorasti ilmi, että puhujat haluavat tehdä itse päätöksen turvapuhelimen hankinnasta. Turvapuhelinta pidetään periaatteessa hyvänä ja hyödyllisenä laitteena, mutta sen mieltäminen osaksi omaa elämää tuntuu etäiseltä. Turvapuhelimen hankinta liitetään jonkinlaiseen riippuvuuteen ja avuttomuuteen, jota ei kuitenkaan osata tarkemmin selittää. Näyttääkin siltä, että käsitykseen vanhuudesta liitetään usein jokin sellainen yhteinen kulttuurinen ominaisuus, jota ei kuitenkaan ole, sillä vanhatkaan eivät välttämättä miellä itseään iäkkäiksi. Vanhuus määritelläänkin usein ulkoapäin, muiden ihmisten näkökulmasta (Tikka 1994) ja usein negaation kautta, mitä edellä olevat lainaukset osoittavat. Vanhat ovat joitakuuta muita, vanhempia ja erityyppisiä ihmisiä (Jyrkämä 1995), ja vanhuus näyttäytyy eräänlaisena toiseutena, jonka yhtenä merkitsijänä toimii turvapuhelin. Ilman turvapuhelinta oleminen on yksi keino sulkea itsensä toistaiseksi ulos vanhuudesta. Viimeisen sitaatin perusteella voidaan jopa sanoa, että ilman turvapuhelinta elävät pitävät itseään toimijoina, jotka kykenevät huolehtimaan itsestään, kun taas turvapuhelimen käyttäjien toimijuus kuvataan rajoittuneeksi ja heidän ymmärryksensä ja kykynsä itsenäiseen suoriutumiseen puutteellisiksi.

Turvapuhelin ja vanhuustekojen kirjo

Artikkelissa tarkastelin, miten vanhuutta rakennetaan ja tuotetaan puheissa turvapuhelimista. Tutkin, miten ikääntyvät itse puhuvat turvapuhelimista, ja millaisia vanhuustekoja näissä puheissa tuotetaan. Tarkastelin puheita sen kautta, miten ikääntyneet puhuvat itsestään toimijoina, ja miten toimijuus ilmenee erilaisina vanhuustekoina. Vanhuusteissa ja -puheissa on kyse biologisen vanhenemisen kommentoinnista; niissä määritellään itse tai toiset vanhoiksi erilaisissa representatiivisissa prosesseissa (Vakimo 2001). Apuvälineteknologiana pääasiassa vanhuksille markkinoitavan turvapuhelimen hankinnan tai hankkimatta jättämisen sekä suhtautumisen turvapuhelimeen voidaan katsoa jo itsessään olevan vanhuustekoa, jotka heijastavat ja tuottavat tietynlaista vanhuuskäsitystä.

Ikääntyneiden ihmisten puheiden tarkastelu kuitenkin osoittaa, että turvapuhelimen käyttö ei ole vain yhdenlaista vanhuuskäsitystä edustava vanhuusteko, vaan se näyttäytyy lukuisina vanhuustekoina, jotka edustavat vahvempaa tai heikompa toimijuutta. Vahvan toimijuuden vanhuustekoa ovat turvapuhelimen toimiminen uusiin harrastuksiin aktivoivana, rajoja rikkovana ikäleikkittelyn mahdollistajana sekä kommentina passiivisuutta ja heikkoutta korostavia vanhenemisennakkoluuloja vastaan. Toisaalta sitä voidaan käyttää turvapuhelinjärjestelmän sääntöjen kanssa leikkittelyyn, jolloin se näyttäytyy kommentina kilttiä ja kuuliaista vanhuutta vastaan. Turvapuhelimen käyttämättä jättäminen korostaa yksin ja ilman apua pärjäämistä, ja se on näin ollen vanhuuden riippuvuutta vastaan kommentoiva vanhuusteko. Toisaalta turvapuhelimen hankinta ikään kuin varmuuden vuoksi kertoo sen toimimisesta yksilöllisenä valintana, vanhuuteen sisältyvien henkilökohtaisten riskien ja epävarmuuksien hallinnan välineenä. Vanhuustekona tämä tarkoittaa ikääntyneen ihmisen vastuun korostamista omasta elämästään.

Heikkoa toimijuutta kuvaavat puolestaan ne vanhuusteot, joissa on kyse turvapuhelimen käyttäjän rajoittuneista valinnan ja vaikuttamisen mahdollisuuksista. Tällaisia ovat esimerkiksi turvapuhelimen hankinnassa ja käytössä korostuva luottamus sukulaisiin tai virallisiin instituutioihin. Turvallisuudentunteen tuottaminen sukulaisille sekä tiukka ohjeiden noudattaminen turvapuhelimen käytössä ovat nöyrää ja kuuliaista vanhuutta edustavia vanhuustekoa. Passiivista vanhuuskuvaa ylläpitää puolestaan välinpitämätön suhtautuminen turvapuhelimeen, vaikka halukkuutta sen käyttämiseen ei olisi edes kysytty. Tähän liittyy myös turvapuhelimen näkeminen hyödyllisenä ja turvallisuutta lisäävänä välineenä, jonka nimissä ollaan

valmiita hyväksymään esimerkiksi laitteen epäesteettisiä piirteitä, lisääntynyttä valvontaa tai riippuvuuden tunnetta. Niiden näkökulmasta, joilla turvapuuhelinta ei vielä ole, turvapuuhelinasiakkaana olemisen voidaan myös itsessään nähdä vanhuus-tekona, neljättä ikää representoivana ikämerkkinä, jota ei tarvita ja jota vältetään, kunnes ollaan valmiita tämän toimijuuden madaltumiseksi nähtävän rajapyykin ylittämiseen.

Turvapuuhelimet yleistyvät ja niiden ominaisuudet monipuolistuvat, sillä paineet ikääntyneiden itsenäisen asumisen tukemiseen kasvavat jatkuvasti. Vallitseva vanhuuskuva, jota vanhuusteotkin edustavat ja tuottavat, vaikuttaa myös palveluiden toteuttamiseen ja palvelujärjestelmään (Rintala 2003). Turvapuuhelinten valmistajat ja palvelujen tarjoajat joutuvat kehittämistyössään miettimään vallitsevia vanhuuskäsityksiä sekä asiakaskuntaansa, joiden elämään nämä käsitykset vaikuttavat. Vaikka olen tutkinut nimenomaan ikääntyneiden ihmisten puheita, enkä niinkään puhujien edustamia ihmistyyppisiä, voidaan puheiden takana olevia ihmisiä tarkastella ainakin ideaalittyyppinä. Turvapuuhelinjärjestelmien ja -palvelujen tarjoajat ovat haasteiden edessä: kuinka ottaa palvelujen organisoimissa huomioon erilaiset edellä kuvatuista vanhuusteista johdetut käyttäjien ideaalittyyppit: aktiiviset ikäleikkelijät, säännöistä piittaamattomat, viimeiseen asti sinnittelijät, varmuuden vuoksi hankkineet, sukulaisten miellyttäjät, ekspertteihin luottajat, passiiviset välinpitämättömät, kuuliaiset sopeutujat sekä mahdollisen leimautumisen vuoksi hankkimista viivyttelevät?

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Safety Alarm Systems and Related Services: From Potholes to Innovation Opportunities

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ABSTRACT

This paper examines an assistive technology targeted to ageing people: a safety alarm and the related service system. A safety alarm is not only a technical device; with the related system, it can be seen as a holistic opportunity for innovation. The operation of safety alarm systems and services depends on many critical points. Potholes lying in safety alarm systems are identified in this study, taking into account the technology, services and organizational network. The potholes are studied as sources and opportunities for potential innovation. Service, social, organizational, process and marketing innovations—combined with technology—are significant parts of innovation activity related to the ageing population. A technical device is not used in a vacuum: there is also organization and service acts, as well as the user with her or his values, appreciations, state of health, and so forth. These factors impact the variety of innovation potential in assistive technology. This paper examines the existing technology and related services as well as various innovation opportunities related to uncovering their shortcomings.

Keywords: Ageing, Assistive Technologies, Care Services, Innovation, Safety Alarm Systems

INTRODUCTION

“When they brought me this [safety alarm], they told me that I won’t be allowed to use the safety chain anymore at the front door... But the safety chain is important, because then I hear if someone is trying to break in.” (interviewee: female 84-year old safety alarm user).

Ageing of the population affects all fields of society. It is a multisided phenomenon also from the point of view of innovations: it means

both challenges and opportunities. Innovations have traditionally been seen to be linked to high-technology fields of industry, but lately, the definition of innovation has been expanded (e.g., Damanpour, 1996; Plessis, 2007). Innovations increasingly presume factors like abilities to interact, learn collectively and build trusting relations between innovating partners (Harmaakorpi, 2004). One expansion has been to bring up and emphasize service and social innovations alongside the traditional technological or product innovations.

The challenges and opportunities related to ageing are not issues only for the social and

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health care sector. Developing successful well-being products and services requires various kinds of know-how that combine research from the social and well-being sector, management of production, management of services, etc. – without forgetting the end-user her/himself – who is a valuable source of information (cf., Capecchi, 1996, p. 178). Such innovation processes are often socio-cultural learning processes, where innovations emerge as processes deeply embedded in normal social and economic activities (e.g., Harmaakorpi, 2004; Lundvall, 1992). Innovations can thus be triggered by diverse causes, not just by research and development activities.

Innovations related to ageing are typical examples of non-linear and complex innovation processes, where opposing aims, inability and resistance to change exist – even when there is awareness of the need for change (e.g., Pihkala et al., 2007.) Research concerning innovation activities in the field of ageing has started relatively recently, and this is reflected in unclarity of concepts as well as narrowness of discourse. Innovations concerning ageing are typically associated with health care, and innovations in health care are considered to be technology oriented (e.g., Kivisaari & Saranummi, 2008; Väyrynen, 2003).

Innovations related to ageing are, however, a far broader phenomenon. This may be seen also when investigating technical devices related to ageing – like ‘the good old’ safety alarm systems as in this study. This study emphasizes that even when developing and implementing the technology for ageing, related innovation processes cannot be merely technology driven by nature. Service, social, organizational, process and marketing innovations – combined with technology – are significant parts of the innovation activity related to ageing of the population.

Likewise, looking at the issue from the point of view of services in particular, it is important to note that service experience consists of several components and includes connections between service providers. As the interview quotation at

the very beginning of this article implies, feeling of safety is a holistic experience. A very typical mistake is to look at the situation from only one service provider’s point of view and not taking into account other elements contributing to the safety experience of the customer.

This study thus focuses on a piece of assistive technology targeted to ageing people; a safety alarm – and the related service system. A safety alarm has traditionally been considered as a technical device only – a technical innovation initially – but when examining it and the related service system more closely, they can be seen as a holistic opportunity for various innovations. In a safety alarm system, a technical device is connected with a service network, and the operation of the system is dependent on many critical points regarding technology, service processes, information flows, etc. (e.g., Melkas, 2004). These critical points may appear as potholes – shortcomings – to be taken into account in future development efforts. The potholes can also be seen as opportunities for innovation, because triggers for innovation often arise from practice-based situations – for example, bad experiences with regard to reliability of technology or unsatisfactory service situations.

The aim of this study is to find the potholes lying in the safety alarm systems – to be investigated from various sides of the system taking into account the technology as well as services and organizational network of the system. The potholes are further studied as sources and opportunities for potential future innovations. The heterogeneity of ageing people may also give opportunities for a wide spectrum of innovations.

The central contribution of the study is to broaden the insight of technological innovations to be linked to other perspectives of innovation. The study points out that a technical device, like a safety alarm, is not born and used in a vacuum: behind the technology, there is usually an organization and service acts, and essentially there is a user with her/his values, appreciations, state of health, living environment, service needs, etc.

All these features and contexts have an impact on seeing the variety of innovation and innovation potential in assistive technology. Broader perspectives and a holistic approach often offer new platforms for innovation potential linked to a single product. Essentially, the innovation potential linked to safety alarm systems has to do with services (cf. service science), but it is claimed to be useful to break this potential up in a more detailed way such as in this study.

THEORETICAL BACKGROUND

The theoretical background concerns ageing and innovations, not technology as a separate topic. This is meant to highlight the novel point of view into existing technology and the social role of technology. The various perceptions of ageing and different types of innovations also form the basis of the empirical analysis in this study.

This study comes close to the ideas of service science (or ‘service science, management and engineering’) – the interdisciplinary approach of service systems aiming at creating a basis for service innovation (Maglio & Spohrer, 2008; Spohrer et al., 2007). Service science sees service system as a configuration of people, technology, other internal and external service systems, and shared information (such as language, processes, metrics, prices, policies, and laws). Besides the internal structure, service systems also have an external structure that means co-producing value directly or indirectly with other service systems. (Spohrer et al., 2007).

Service science combines organization and human understanding with business and technological understanding to categorize and explain the many types of service systems that exist as well as how service systems interact and evolve (Maglio & Spohrer, 2008). Service science as a separate field does not have a long history. This study is essentially linked to it, but its approach is closely connected to innovation studies.

Various Perceptions of Ageing

Getting old is a two-sided phenomenon: it brings along many losses, but it has also been described as a time of harmony, freedom and resources (Koskinen, 2004). Even in our cultural representations, old age is divided into two parts (Karisto, 2007). There is an old age proper, the fourth age, framed by inevitable decline of the body, restraints, necessities and disengagement, and there is a vision of a third age framed by consumption possibilities, choices and opportunities (Karisto, 2007, p. 103; Laslett, 1989). Despite the myths, stereotypes and dichotomies, ageing people are a very heterogeneous group just like other age groups, among which people differ significantly from each other regarding, for example, their health, wealth, behaviour and lifestyle. The many aspects of ageing are briefly discussed in the following.

Historical and contemporary images of ageing have generally reinforced negative aspects of ageing (Mulley, 2007), characterized by words like *degeneration* and *decline* (Sadler, 2000). Illnesses, decline of functional ability, frailty, loneliness, lowering of status, increased dependency on other people and increased need of care also lead to seeing ageing as an economical and political burden (Koskinen, 2004). Care costs are indeed age-dependent, but age itself is not equal to illness, which is overlooked when seeing old age as a problem. Service use may be postponed by means of holistic health promotion. Illnesses compress to the last years of life irrespective of life expectancy, which means that the prolongation of age itself does not dramatically increase care costs. (Karisto, 2007, p. 102.) *Old age as a challenge* implies as a whole, however, that new products and operating models are needed so that scarce financial resources can be made to respond to the needs of a growing group of older people.

A counter-discourse to this has emerged around the concepts of ‘active ageing’, ‘the third age’ and ‘productive ageing’, inter alia. The concept of ‘active ageing’ was adopted by World Health Organization in the late 1990s,

and refers to continuing participation in social, economic, cultural, spiritual and civic affairs (Avramov & Maskova, 2003, p. 26). Likewise, the discussion of the third age (Gilleard & Higgs, 2002; Laslett, 1989) functions as an alternative view to the interpretation of population ageing as a burden (Karisto, 2007, p. 103). In this concept, the focus is on healthy, autonomous and active ageing; it is seen as a time of personal achievement and fulfilment (Laslett, 1989). The third age has also a cultural dimension that suggests that people reach retirement age with different expectations and orientations than in earlier times (Karisto, 2007, p. 104). Increases in income, wealth, consumption and leisure constitute core elements of the post-war changes that affected the emergence of the third age as a generational phenomenon (Gilleard & Higgs, 2002). Close to the ideologies of active ageing and third age is also the term 'productive ageing' (e.g., Morrow-Howell, Hinterlong & Sherraden, 2001). Advocates of productive ageing argue that societies simply cannot afford to overlook the potential of the older population to serve as a resource for social change and economic growth (Morrow-Howell et al., 2001, p. 4).

Old age as an opportunity is also connected to seeing old people as active consumers (e.g., Kohlbacher & Hang, 2007; Kohlbacher & Herstatt, 2008). This is based on the ideas of continuity theory of ageing – that personality, attitudes, values and basic patterns of behaviour remain constant throughout the life span (Atchley, 1989). The former lifestyle guides the consumers' behaviour. For example, those who are used to consuming when young and healthy will continue doing so as they get old (and perhaps sick). Innovations related to, for instance, the consuming of services and free-time products (such as travelling, sports and cultural activities) are emphasized.

Various Perceptions of (Service) Innovation

The meaning of innovations has recently been strongly emphasized in several areas of life. The main focus of innovation research has tradition-

ally concentrated to technological innovation within manufacturing – reflecting the fact that innovation theories have their roots in the era of manufacturing as the major economic activity. The social aspect of innovation has been left aside in technology policies and growth theories (e.g., Drejer, 2004; Ruuskanen, 2004). The definition of innovation has however been expanded, which in turn has enabled and promoted the discussion on innovation activities in, for instance, services and the social and health care sector. One expansion has been to focus on service, social, process and organizational innovations alongside the traditional technology or product innovations (e.g., Hartley, 2006, 2008; Tidd et al., 2005). Actually, the present concept of innovation is getting closer to the Schumpeterian view of innovations. As Drejer (2004) argued, the service-specific studies and the synthesis approach that sees service and manufacturing activities rather as intertwined are in strict accordance with Schumpeter, as they focus on innovation being much more than technological product and process innovation.

Understanding concerning innovation in services has also changed over time (Tether & Howells, 2007). Even though the Schumpeterian innovation approach is seen as broad enough to encompass services and manufacturing (e.g., Drejer, 2004), innovation in services was neglected until the 1980s. Services and other 'low technology' sectors were seen as uninteresting adopters of technology rather than as 'real innovators'. The continued growth of services in the early 1980s meant that they became difficult to ignore, but until these days, approaches applying a traditional manufacturing logic to service innovation exist alongside approaches that view services as distinctive activities (Drejer, 2004.) According to Tether and Howells (2007), when the importance of services was noted in the early 1980s, they were examined using the conceptual tools developed to understand technological innovation in manufacturing. A 'distinction phase' emerged in the 1990s, and there was a growing interest to highlight the 'peculiarities of services' and

how services, and their innovation activities, differ from archetypical manufacturing.

The ‘synthesis approach’ to service innovations began with the agreement that the study of innovation should combine analyses of both technological and non-technological forms of change. It was also agreed that this broader vision of innovation has as much relevance for manufacturing and other sectors as it has for services. (Tether, 2005; Tether & Howells, 2007.) The need for the synthesis approach is underlined, because many of the claimed peculiarities of service innovation – like the strong presence of organizational innovation and involvement of multiple actors do also apply in manufacturing (Drejer, 2004, p. 560). The synthesis approach recognizes the importance of both technological and non-technological (and especially organizational) forms of innovation, as well as interactions and complementarities between these two forms. The approach seeks to develop insights that are relevant to the whole economy, not just services (Tether & Howells, 2007).

A lively discussion concerning service innovations has related to the notion of uniqueness of every service delivery because of concomitance of service creation and consumption and keeping the customer in question in mind. This has led to confusion concerning whether all services or no services represent the creation of something new. (Drejer, 2004.) Service innovations are seldom results of *a priori* planning, but they are typically recognized only *a posteriori* (Toivonen & Tuominen, 2006, p. 1). One concept developed to grasp this unplanned nature of service innovation is ad hoc innovation (e.g., Drejer, 2004; Gadrey et al., 1995; Gallouj, 2000; Sundbo & Gallouj, 1998). It has been defined as an ‘interactive (social) construction to a particular problem posed by a given client’ (Gallouj & Weinstein, 1997, p. 549; Drejer, 2004, p. 557). The concept challenges the basic principle that innovations by definition, through their associated diffusion, have more than one specific application (cf. Schumpeter, 1934; Toivonen & Tuominen, 2006). Sundbo and Gallouj (1998) argued that even though ad

hoc innovation as such is not reproducible, it is indirectly reproducible through codification and formalization of part of the experience and competence developed in constructing the particular solution. According to Drejer (2004), this equalizes learning, competence development and knowledge codification with innovation, which is problematic. Even though there are unique features in every service act, they can be developed into innovation, if the replicable elements thus are identified and applied in other cases (Toivonen & Tuominen, 2006).

The point in this study is not so much whether service and product innovations fundamentally differ from each other or whether they can be approached through the same general concepts and methods, or if service innovations are in fact innovations at all because of their relative uniqueness. Instead, we note that an approach that takes the blurring boundaries between manufacturing and services into account, and is not based on the traditional manufacturing–services dichotomy (Drejer, 2004) fits especially well into studies of safety alarms systems, where the technology and services are tightly intertwined. The safety alarm technology forms part of the safety alarm service: the technological functioning of the system is an essential part of the service experience. On the other hand, service can be seen as “inscribed” into technology and physical properties of the artifact (see Akrich, 1992). For instance, the size and the tightness of the alarm button dictates who is capable of using it and how easily it can be pushed by accident – which also forms an important part of service experience.

The view that innovation in services often involves complementary changes to technologies and non-technological factors implies that innovation in services is typically considerably more complex than earlier ‘technology adoption’ perspectives would suggest. This also implies that technology diffusion and productivity gains will only be realized through greater attention being paid to ‘soft’ issues like skills and organizational structure, and their interaction with technologies (Tether & Howells, 2007).

According to the traditional linear model, the number of innovations can be increased by giving more resources to technological basic research, because science and technology are the driving forces for innovations. Nowadays, innovation is seen to be as much a social as a technological process. Innovations emerge increasingly as non-linear processes embedded in normal social and economic activities, and as processes of interactive learning (Lundvall, 1992). In such (social) processes, different kinds of actors are involved, and multi-directional information flows are emphasized in creating and combining knowledge. In the social and health care sector, innovations are typically non-linear and practise-based (e.g., Savory, 2009).

Innovations related to ageing also mould the social reality and social perceptions of ageing. In line with the different images of ageing, innovations may be approached from two directions: (i) *challenges*; new services, products and operating models are needed so that scarce resources can be made to respond to the needs of a growing group of older people, and (ii) *opportunities*; innovations that are related to the consuming of services and free-time products (for example, travelling, sports and cultural activities).

As to the different innovation types in the context of ageing, various innovation types usually co-exist. Dividing innovation into types is about looking at innovation from different perspectives – as there are practically no pure types. For example, supporting independent living of older people can be a broad concept with connections to technology, services, process changes, new types of marketing, etc. Dividing innovation roughly into types may also contribute to distinguishing cause-effect relationships and co-impacts of various innovations.

METHODS

The research problem is to explore and identify innovation opportunities related to ageing of the population, in particular safety alarm systems

– with the help of the “pothole approach”. The research questions are as follows:

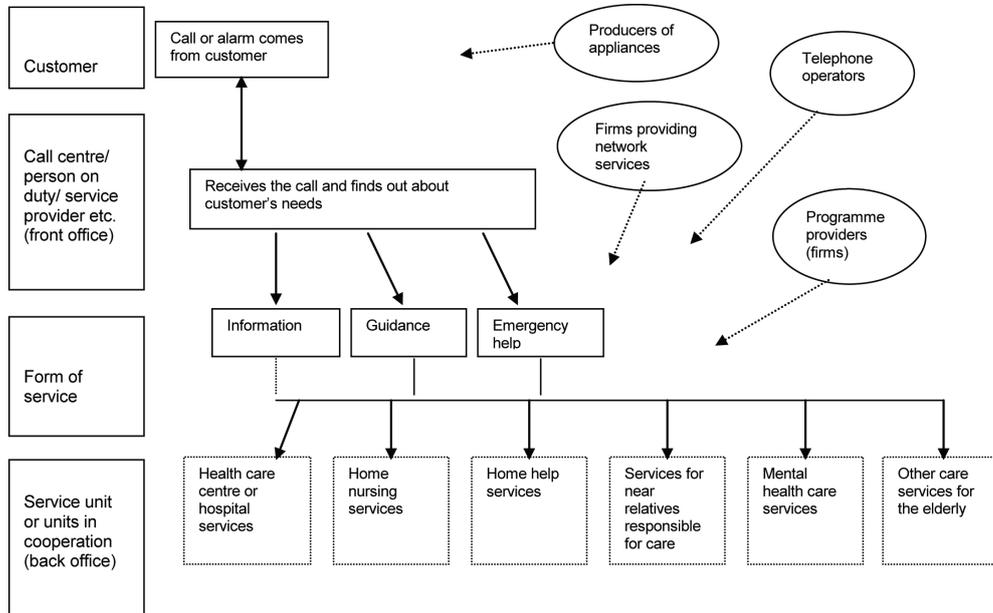
- Which kinds of potholes are there in the safety alarm systems and services?
- Which kinds of safety alarm (service) innovations are related to exploiting the opportunities of ageing?
- Which kinds of safety alarm (service) innovations are related to defeating the challenges of ageing?

Safety alarm systems were chosen for the research, because they are well suited to a holistic investigation. A safety alarm (telephone) is an apparatus with a big button and a pendant or chain around the neck, or a wristband with also a help button on it. One can give an alarm by pushing the button. They have also been called ‘social alarm systems’. So-called well-being wristbands and mobile safety telephones are also being used these days. There are various types of accessories for safety telephones – dosers of medication, fire alarms, door alarms, epilepsy alarms and so forth (Melkas, 2004). Although safety alarms as such have been used for several decades, they – as well as the related services – are continuously developed and supplemented.

Various definitions have been given in earlier research; for instance, safety alarm services consist of a safety alarm customer, a call centre and safety helpers who call on the customers to provide help or check up after an alarm has been given. A slightly different perspective is that safety alarm services contain alarm appliances, reception of alarm information, alarm and check-up visits and check-up calls. These definitions are, however, somewhat too restricted. Telephone installers and medical institutions such as health centres and hospitals need to be included, as they are essential parts of safety alarm service systems. (Melkas, 2004).

Safety alarm systems were described in a more detailed way by Melkas (2004). National systems may vary; the present study focuses on Finland, where some 70 000 people use safety alarms. Figure 1 illustrates a typical municipal safety alarm service network in Finland. In

Figure 1. An example of a municipal safety alarm service network in Finland (source: Melkas, 2004)



safety alarm systems, technology, services, organizational structure, and networks are needed, and they all need to function together.

The materials collected for this research consist of interview and survey data. Interviews were conducted with elderly customers and personnel working in safety alarm services. Interviews were conducted in 2002–2007. This research does not focus on comparisons over time. The survey was conducted in 2007. In the data collection, the organizations or service networks and interviewees can be seen in Table 1.

In practice, the system of an individual care home usually includes several other orga-

nizations in the service network (typically a health centre, hospital, home care service, etc.). In a larger service system, even some 100 organizations may be involved in a national, regional or municipal network. This high number reflects the challenges related to, for instance, information flows and technology-related training for care staff.

As to the care staff interviewed, most of them were women (44 women and 11 men). There were 20 people in managerial positions and 35 in employee positions. The organizations they represented were as follows: company (12 interviewees), municipality (17), non-governmental organization (10), foundation (13), and

Table 1. Interviewees in different environments

	<i>Customers</i>	<i>Care staff</i>
Sheltered accommodation (housing services in care homes)	19 (2002) 4 (2007)	4 (2002) 10 (2005) 5 (2007)
Larger service systems	21 (2002)	38 (2002)

cooperative (3). The interviews focused on how the safety alarm services were arranged, functioning of and actions in individual service processes, collaboration among care workers, the technical devices in use and their usability, information flows in the services, organizational changes involved, networking among service organizations, and customers' experiences.

Among the customers interviewed, there were 33 women and 11 men, who were 62–98 years of age. The thematic interviews focused on, for instance, knowledge about safety alarms, functionality of safety alarms and the related system and services, needs concerning safety alarms, and situations in which they are used. Ageing, housing and coping in daily life as well as feelings of safety and possible fears were also discussed. People's attitudes concerning novel safety technology implying possible increased control and supervision were also investigated. In the interviews conducted in 2007, also experiences concerning processes related to the acquisition and use of assistive devices were investigated. The interviews were transcribed.

The interviewees were selected on the basis of their special knowledge using a discretionary sample (Polit & Hungler, 1995). The sample was chosen according to the purpose of the qualitative research; participants' roles in the operational environment and the knowledge they had of the phenomenon being studied were central. In the collection of the interview data, mainly individual interviews were conducted – in addition to a few group interviews. As to the care staff interviewed, the first interviewees were selected on the basis of their reputation as informative sources within the service networks. They, for instance, served as cooperative liaisons or contact persons between individual organizations within the networks – or individual units of an organization.

The survey data were collected in 2007 and consisted of 20 survey questionnaires from care staff and customers (joint questionnaires). The survey was conducted within the sphere of a smart home pilot targeted at ageing people who had short-term housing needs related to, for instance, end of hospitalisation, holidays of

caring relatives and assessment of living and housing conditions. Experiences of customers and personnel as well as processes related to the use of assistive devices were investigated with the help of the questionnaires. The research environment in question was sheltered accommodation.

It was not a question of obtaining comparable time-series data, but the datasets reflect the situation in the same thematic area at several points in time and from different points of view. They provide a rich material for research concerning innovations.

The survey data were analyzed quantitatively (Melkas et al., 2008). The general themes that were identified are taken into account in the qualitative analysis presented here. The interview data were analyzed according to the principles of qualitative content analysis (deductive and inductive). Contents of the interviews were categorized and classified according to the following structure:

- Technological pothole
- Service pothole
- Process pothole
- Organizational pothole
- Marketing pothole
- Social pothole
- Ethical pothole

These were looked into from the points of view of customers and care staff. The different types of potholes follow a classification of different types of innovations: technological, service, process, organizational, marketing, and social innovations (e.g., Afuah, 1998; Ståhle, Sotarauta & Pöyhönen, 2004, p. 11). There are also many other ways to classify innovations in the literature. Reinmoeller (2008), for instance, wrote about open innovations in the context of service innovations, and Hennala and her colleagues (2008) noted that innovations are often intertwined so that it is difficult to classify them at all. For instance, in the public sector, rhetorical and administrative innovations may sometimes be practically inseparable. Value innovation, as defined by Kim and Mauborgne (1997), implies

paying little attention to matching or beating rivals and concentrating on making competitors irrelevant by thinking beyond existing assets and capabilities as well as thinking in terms of the total solution customers seek. In this study, certain types of innovations are included, but they also contain characteristics of others mentioned in the literature.

Given the different circumstances and themes in the interviews, the amount of space given to a topic was not particularly relevant in the analysis. After the first stage of the analysis – the identification of the potholes related to the use of safety alarm systems, the point of view of innovations was brought forth by searching for innovation opportunities and sources (“*bas*”, cf. knowledge management; Nonaka & Takeuchi, 1995) of new innovations on the basis of the potholes. This was the second stage of the analysis.

In this deepening of the analysis process and search for new analytic alternatives, an inductive process took place. Innovation opportunities and sources were sought for by utilizing concepts such as impacts, strengths, weaknesses, forms of existence, lacking forms of existence, and prerequisites. The results concerning the potholes were re-categorized with the help of those concepts.

RESULTS

Potholes

The concept of ‘pothole’ is used in this study to describe challenges, difficulties, weaknesses and threats that have negative effects by causing extra costs, increasing the work burden of the care staff and causing customer dissatisfaction – sometimes even shortcomings in care that could have been avoided. The potholes may be related to introduction and ‘rooting’ of innovations into the ageing person’s home or elsewhere, or to later use and provision of the services and devices.

The potholes identified on the basis of the interviews and the survey are shown in Table 2. It is important to keep in mind that Table 2

includes points of view or thinking approaches rather than pure types, because drawing the line between different types is often artificial. Some issues are deliberately brought up in several cells, because getting rid of these potholes requires holistic actions.

Technological potholes refer to technology or material (low-tech) related problems such as unreliability or physical discomfort of use, for example chafing. The technological potholes often lead to other potholes. For example, if it is possible to push the alarm button by accident, the customer may wake up at night noticing that the care helpers are standing by her/his bedside. On the other hand, the alarm button should not be too tight to be pushed with weak fingers. Technological opportunities may also be underutilized – for example, technology use could be of significant assistance in networking among care staff and other professionals in the services.

Service potholes imply unclarity and confusion or customer dissatisfaction in service provision situations. There may be differing views between care staff and customers about when it is “allowed” to make an alarm and which kinds of alarms are “needless”. Especially so-called social alarms are problematic; what to do in circumstances in which a customer pushes the alarm button just because of feeling lonely, for example. These problems are also related to ethical issues; if the service is not “officially” targeted for people suffering from loneliness or mental problems, for instance, it would be humanly desirable to guide those people to the services they need instead of just ‘abandoning’ them. These kinds of problems may appear if the service provider has not considered the holistic situation of the safety alarm user: the embeddedness of the safety alarm within the other components of feeling safe. Besides the health component, the feeling of safety is essentially related to social aspects (loneliness, fear of violence, etc.) (see, e.g., Pekkarinen, 2003).

The service potholes are often connected with process and organizational potholes, in which lack of communication and information flows between units of a care organization or

Table 2. Potholes in safety alarm systems and services

	<i>Customers' point of view</i>	<i>Care staff's point of view</i>
Technological pothole	<ul style="list-style-type: none"> - unreliability of the device - physical discomfort of use - varying needs as to the sensitivity of the alarm button - the parts of the device are not necessary replaceable and easy to care - problems in reconciling ergonomics and attractiveness 	<ul style="list-style-type: none"> - needless alarms (especially with well-being wristbands) - if many alarms are given at the same time, the system is blocked (in sheltered accommodation) - insufficient exploitation of technological opportunities to increase networking among care staff in the services
Service pothole	<ul style="list-style-type: none"> - a fear of technology replacing personal service - differing views between customers and personnel about appropriate reasons to make an alarm - sometimes delays in getting a response and then help - insufficient information on the services, use of the alarm, etc. 	<ul style="list-style-type: none"> - development of orientation practices - insufficient repair service and follow-up of use - a fear that a customer may not cope with a device only; without a human-being close by - no holistic view about a customer's care and other public services as a whole - information about customers' feedback and problems does not reach the right people and is not taken into account
Process pothole	<ul style="list-style-type: none"> - customers' feedback and needs do not reach the developers of the service - an unclear (and complicated) acquisition process of a device or service - unsystematic or no follow-up of use (e.g., changes in health condition) - unsystematic practices in informing the customer and near relatives about the services during periods of transition, such as when returning home after hospitalization - lack of medical equipment of the safety helpers - misunderstandings about the reason of the alarm call because of customers' dialect or unclear speech 	<ul style="list-style-type: none"> - problems in prioritizing the alarms in sheltered accommodation - problems with the keys to customers' homes – to carry them on or to get them from the office - problems in information flows and collaboration network - a holistic view about the customer is lacking (including the apartment's characteristics, suitable medication, sufficient outdoor activities, fluid balance, nutrition) - no or meagre involvement of near relatives of customers and provision of information to them
Organizational pothole	<ul style="list-style-type: none"> - problems in understanding customers' holistic life situation among the actors of the service network - too late information and start-up of assistive technology acquisition processes; delays in the processes 	<ul style="list-style-type: none"> - lack of network leadership and management in the multi-professional and multi-organizational services - care staff work as separate "islands", perhaps in different organizations; no common skill requirements
Social pothole	<ul style="list-style-type: none"> - the safety alarm system does not operate outside of the home; the user may not have the courage to go out of the home – the social environment becomes very small - inconsistent instructions of service providers (e.g., concerning making a safety alarm in case of emergency or of violence and calling the emergency number) 	<ul style="list-style-type: none"> - the holistic situation of customers is not understood and taken care of so that reasons for alarm calls could be prevented proactively (e.g., falling on the floor due to dizziness, when the customer's fluid balance is not all right)

continued on following page

Table 2. continued

Marketing and supply pothole	<ul style="list-style-type: none"> - stigmatizing outlook of the safety alarm wristband; safety alarm connotating frailty and being in need of help - poor knowledge about how and where to acquire safety alarm device and services - marketing is targeted especially to older people but even younger ones would benefit from information - supply and marketing of safety alarm devices and services are too concentrated in public social and health care services; testing and getting acquainted with them is not possible/easy 	<ul style="list-style-type: none"> - services do not necessarily include orientation and repair service - insufficient or no knowledge about safety alarm systems in different professional groups; highly relevant professional groups such as medical doctors do not have basic knowledge about devices, preconditions of using them and availability
Ethical pothole	<ul style="list-style-type: none"> - lack of intimacy - feeling of control 	<ul style="list-style-type: none"> - stress and feeling of powerlessness - often difficult decisions when to interfere if the customer does not benefit from the safety alarm service

among organizations are focused on. Process-related problems often become visible as extra work: unclear responsibilities, matters being no-one's responsibility, overlaps, as well as settling and clearing up things, when the necessary information does not penetrate the whole service chain.

Social potholes in the safety alarm systems and services are connected to the technological fact that the safety alarm wristband does not function far from the base station. In some cases, this may cause isolation of the user from normal life, if she/he is afraid of falling, for instance, and therefore has no courage to leave home. Some users hoped that the safety alarm wristband could be used also when taking a walk in the woods. Some users were afraid of violence in public places, and they hoped that the safety alarm service would increase their feeling of safety and security also in that regard.

Marketing potholes are related to traditional ways of thinking in which the safety alarm devices and services are seen as targeted to special groups, the ageing people and the disabled. Some customers felt that the appearance of the wristband is somewhat stigmatizing – and labels the user as weak, incompetent and not being capable to care for her/himself. Besides

marketing in the traditional commercial sense, this issue concerns the brand and message, including all the connotations that the safety alarm device and service carry along.

There are also some ethical potholes that are often causes of technological solutions or service arrangements. In housing services (sheltered accommodation), a lack of intimacy may be felt, if the calls can be heard via the loudspeaker in every room. There is also the question of feeling of surveillance and control when increasing the feeling of safety with the help of safety alarm services. An ageing person may have to weigh, for instance, if she/he approves a certain increase in control by care staff in the name of safety. Help being available typically implies certain control, but this can also make some other things possible. An ageing person may have to ponder which is a better option: living at home without control but hardly going outside in the fear of falling, or getting the courage to take walks in the woods with the help of GPS tracking. It is not easy to say which way of life is more active and independent.

From the point of view of care workers, powerlessness is sometimes felt, as the care workers wonder how the customers cope with

their loneliness or other problems that the safety alarm system cannot solve. The care workers may also have to ponder what to do if the customer does not understand the meaning and function of the safety alarm device and service or if she/he does not use or wear the device.

One important pothole is possible excessive belief and trust in technology and not seeing the holistic situation of the customer. Safety alarm services are not used effectively if the causes for alarms are not prevented in advance, where possible – if there are, for instance, barriers in the accessibility of the home or failures in medication and nutrition of the customer. Such proactive prevention requires extensive and well-informed collaboration between different care organizations, and an understanding of the holistic character of safety alarm services and systems.

The research results concerning potholes highlighted the need for tailored services based on an ageing person's needs and wishes, while taking advantage of technological solutions. Melkas et al. (2008) found that central operational processes in assistive device-related services (regardless of the service provider) are as follows: (1) acquisition process of technologies and assistive devices as well as of rearrangement and rebuilding works in the home, (2) introduction and orientation process (of the ageing people, their relatives and care personnel), (3) information and communication process, and (4) service and monitoring process. Many of the potholes are related to these processes, but not all. Some are related to design and desirability of the devices as well as costs of the services, such as opportunity costs, and ethical considerations that are always important in care.

From Potholes to Innovations

Even though the potholes emerge as problems and shortcomings, they may also have important positive effects as drivers for innovations. It is actually typical that innovations in the social and health care sector are responses to problems perceived (e.g., Cunningham, 2005) rather than

careful foresight. A more conscious change in the way of thinking concerning potholes as opportunities for innovations could be made, however. Drucker (1998) noted that systematic innovation begins with the analysis of sources of new opportunities. Drucker specifically brought up changing demographics as an opportunity source – in line with the present study. He also noted that would-be innovators must go out and look, ask and listen. They work out analytically what the innovation has to be to satisfy an opportunity, and then they go out and look at potential users to study their expectations, values and needs.

Based on the second stage of analysis – searching for innovation opportunities and sources (“*bas*”) of new innovations on the basis of the potholes – Table 3 includes examples of potential innovations in the context of ageing, categorized according to the third and fourth/fifth ages. The results presented in Table 3 are based on the potholes identified in the first stage of analysis (see Table 2). It needs to be kept in mind that typologies of this kind are analytical tools, and they are not always easily distinguishable in practice. The innovation types related to safety alarm systems do not appear as pure types, but the distinction between the types is made to make the diversity of this holistic phenomenon more visible. Diving innovation into types is an analytic tool to see the various perspectives of innovation in safety alarm systems. The innovation potential in the systems lies essentially in the combination of various innovation types. In accordance with Table 2, also Table 3 contains issues that are related to different levels, from the individual to the systemic level.

Innovations in Exploiting the Opportunities of Ageing

The innovation potential in safety alarm systems lies in the opportunities brought by the third age, on the one hand, and the challenges of the late old age, on the other hand (Table 3). The third age as a time of freedom and resources makes it possible to see safety alarm

Table 3. Examples/opportunities/bas for innovations in the context of safety alarm systems and services

	<i>Innovations in exploiting the opportunities of ageing</i> (the third age, time of resources) <i>Basic idea: Safety alarm systems support independent living at home and activities outside of the home.</i>	<i>Innovations defeating the challenges of ageing</i> (the fourth/fifth age, time of increasing need of care) <i>Basic idea: Safety alarm systems support independent living at home or help the care work in housing services or in a health centre or a hospital.</i>
Technological innovation	- Adaptable interface of a safety alarm device including extra functions and services according to the needs of the customer	- New safety alarm types to new user groups such as people suffering from dementia - Technological solutions to reduce the number of “needless” alarms? - Technological solutions to increase networking among care staff in the services
Service innovation	- Service and product concepts (safety alarm systems connected to other services) to support independent living - Safety alarm systems in sports and travelling	- Safety alarm systems also as “social alarm systems” that guide people suffering from loneliness and insecurity to the right kinds of services - Start organizing assistive services into the home already when an ageing person is first hospitalized
Process innovation	- Connecting first aid, police, travel guides, etc. to safety alarm service processes - Information innovations: skillful collection, handling and use of information that is needed and transmitted in safety alarm services (increased attention to information quality)	- Smooth service chains when medical care is needed - Safety alarm system as a natural part of a service chain - Clarification of the acquisition process of devices and services - Improving impact assessment, orientation and follow-up of services - Developing easy-to-care and changeable parts for the devices; combining ergonomics and desirability
Organizational innovation	- New ways of collaboration between, e.g., social, health care and technical sectors	- Collaboration networks in recognizing the overall situation of the customer - Rearranging tasks and responsibilities in the social and health care - Breaking the borders between public, private and non-governmental third sectors
Marketing or supply innovation	- Design for All thinking - Attractive appearance of devices - Targeting marketing also to younger age groups - Safety alarm function in navigators, heart rate monitors, etc. - Selling safety alarm devices in supermarkets or alike (easy accessibility) - Offering information on assistive technology in new environments, for example in sports institutes, hotels, libraries, and involving and informing also near relatives of ageing people	- Disseminating basic information about assistive technology to new groups of experts, for example medical doctors - Safety alarm devices connected to furniture - Provision of objective information about safety alarm systems in hospitals - Offering proper information to near relatives; e.g., by arranging an ‘assistive technology day’ in housing services or in hospitals - Offering possibilities to test technological solutions at home
Social innovation	- Safety alarm services that broaden the social environment - Safety alarm services to prevent violence	- Safety alarm systems connecting people of different ages, conditions of health, etc.
Ethical innovation	- Creating a feeling of safety with considerate and tactful surveillance	- Responding to the problem of loneliness with networks between different fields, sectors and professionals

systems as a support for independent living or taking walks outdoors (or jogging, hiking or travelling). The appearance of a safety alarm wristband could be like that of a wrist watch, or the device could be connected to a heart rate

monitor or a navigator – devices used by all age groups. This could be an important innovation connected to marketing of safety alarm systems. If safety alarms create possibilities for ageing people to go out and broaden their physical

and social environment, they can be seen as a remarkable social innovation – maybe creating new forms of social life and even new cultures of getting old.

The essential issue here is to broaden the traditional concept of safety alarms as assistive technology targeted to special groups – so that they are transformed into a whole new concept covering a large range of services, where the traditional safety alarm function is only one part. It could even be possible to break the border between the third and fourth ages through a carefully created image of a safety alarm system; for instance, when the body is ‘older’ than the mind – when the body sets physical restrictions to the active mind.

The most fruitful potential for innovation often lies in the interfaces between industries and competencies. The emergence of such innovations often takes place in the context of ‘weak ties’ (Granovetter, 1973) – loose connections between the innovation network and its environment. The concept was further developed by Burt (1992; 2004), who argued that innovations are most likely found in the structural holes between innovation networks – representatives of different disciplines or communities of practice. By exploiting these kinds of ties and thus connecting expertise coming from different backgrounds it is possible to find new kind of thinking and ways to see safety alarm systems, and to respond to new kinds of needs.

Innovations Defeating the Challenges of Ageing

Safety alarm systems have an important role in defeating the challenges lying behind the fourth and fifth ages, the time of increased need of care (Table 3). Safety alarm systems offer safety and care when needed, and in this way they compensate the weaknesses that the ageing body brings along. New variations of the technology and the interfaces in the safety alarm systems could make them suitable for new user groups, for example, people suffering from dementia. Safety alarm systems can be a decisive step in making it possible for an ageing person to live in her/his own home, which is

often humanely valuable, and also far cheaper for the society than life in a care institution.

The question here is about care that is organized in an innovative way. Service and process innovations are “worth their weight in gold” when people’s poor health causes a lot of costs. Innovations may facilitate the work of care workers so that they are able to divide their time to help a bigger number of people in need. These kinds of innovations create new ways of action, but it is still a question of responding to the same kind of humane needs as earlier. By identifying problems and breaking them into little pieces, opportunities are created for changing the general way of thinking concerning ageing further away from the problem orientation. In innovations defeating the challenges of ageing, it is often a question of smooth service processes and information flows, good orientation to all the relevant people, foresight and impact assessments, and follow-up regarding the users’ abilities to benefit from safety alarm systems.

CONCLUSION AND DISCUSSION

In the case of safety alarm systems, service and technology form an interlinked entity, and the functioning of this relationship affects the holistic user experience. However, in spite of seeing service and technology as hybrid, it is possible to distinguish different aspects of this entity, according to the entry perspective.

It is also important to note that besides the internal structure of service and technology, service systems also have the external structure – connections with other service systems (Spohrer et al., 2007). In the case of safety alarm systems – to be able to speak about holistic innovation – it would be essential to make and improve connections to other service systems, as the feeling of safety and the ability to live independently are dependent on the holistic situation of the person, not the safety alarm only.

Looking at the safety alarm systems from different perspectives reveals that innovations related to ageing essentially deal with reconcil-

ing different – sometimes misunderstood and opposite – needs and requirements: technology versus human service, user versus service system, healthy and wealthy versus sick and poor, activating versus adapting, productivity versus quality, preventing versus curing, safety versus control, and so forth. These polarities often appear as problems and potholes, but finding answers to these may create innovations – as shown in this study – as innovations often emerge at the interface of different types of expertise and perspectives.

There is not just one unique kind of ageing; ageing is very multi-dimensional, and the conceptions and images of ageing people vary as well. Different kinds of conceptions of ageing produce different kinds of innovations; seeing the old age as an active and productive time of life produces different kinds of innovations than seeing the old age as adapting to sickness and frailty. This study showed that safety alarm systems are not just individual technical devices, but they are related to a wide range of perspectives from services to marketing. Combinations of these can create new development opportunities, especially when the variety of ageing is taken into account.

The concept of innovation is also affected by the use of the safety alarm systems. An innovation essentially includes the practical application of an idea or an invention. By definition, an invention will not become an innovation until it is used and proved to be valuable, because it is the user, in the end, who defines its value. The acceptance of a product defines its usefulness and value. The concept of value in the definition does not refer to economic value only, but it may also mean human value. Taking into account different types of ageing people in the innovation discussion is important and may produce novel approaches and views. Understanding and opening up the diversity of aspects of the holistic theme of safety alarms is also needed in developing the innovation *processes* – ways of *making* new innovations – as well as in implementation and embedding of innovations; for example, new models for integrating the service system into the ageing

people's everyday lives and the work practices of the care workers.

User types and ways to use safety alarms are numerous (Pekkarinen, 2005). Some people are extremely active in acquiring safety alarms and may use them very “creatively”, disregarding the rules that the service providers have set. At the other end of the spectrum, there are users with safety alarms acquired by someone else, users who really struggle to the end not to trouble other people with alarms. Pekkarinen (2005) identified the following reasons to have and ways to use the safety alarms: active playing; disregarding the rules; struggling to the end; possessing just to be sure; pleasing the relatives; trusting the experts; passive disinterest, and obedient adaptation. There are also people who try to refrain from acquiring a safety alarm because they are afraid of becoming stigmatized. Safety alarm service providers face many challenges – how to take into account these different ways to use safety alarms? The users may use the product in a clearly different role than the one it was initially designed for. Taking this into account may contribute to producing innovations in the future.

Safety alarms may also contribute to and construct the general conception and appreciation of ageing people in the society. They can be studied through the concept of “age act”. Age acts are one of the frequent ways to produce the cultural meanings concerning people's age. Age acts are everyday actions taken in social interaction; actions producing one's own or other people's high or higher social age, or actions defining oneself or others within the category of the aged (Vakimo, 2001, p. 37).

Getting biologically old is an automatic and continuing process, but the social and cultural meanings of age are negotiated in every-day interaction situations. The aspects of safety alarm systems can be seen as age acts: a certain image of the old age is constructed when, for instance, a safety alarm stigmatizes the user by its medical-looking appearance, and if its acquisition process is institutionally organized making the user a “target” of a service instead of letting the user be an agent selecting the

style, appearance, properties, and so forth of the safety alarm. Selling safety alarms also in supermarkets might be useful, too – not only to improve accessibility, but also to help safety alarms become day-to-day equipment without a message about marginalization. Essential issues are whether the users of safety alarms are considered to be active subjects; whether the service processes are user-centred, and how the “social” alarms (due to loneliness, etc.) are handled.

The branch of safety alarm services will likely undergo many changes also in the future, because of, inter alia (Melkas, 2004): (i) development of technology (mobile safety alarms, well-being wristbands, various accessories), (ii) increasing amount of users due to ageing of the population, increasing compatibility with other types of appliances and increasing use of technology in general among ageing people, (iii) financial pressure on public services, (iv) improvements in understanding the importance of integrating the customers’ points of view into services, (v) development of new forms of work, such as call centres, (vi) development of networking and virtual teams, (vii) improvements in understanding the importance of a generally safe and accessible environment; development of Design for All thinking, as well as (viii) challenges of the building industry; the relationship between construction and renovation, on the one hand, and well-being technology and assistive devices, on the other hand.

There is thus plenty of room for innovation studies also in the future. In this study, it was also noted that despite sometimes rapid technological development and various societal changes in Finland, the situation in 2002 and 2007 was very much the same. The same problems and potholes persisted, and they were not turned into positive developments – yet. Customers’ views and involvement in the development of services could be increased, but care workers sometimes have negative views about customers’ abilities due to, for instance, alarms that are considered needless and health condition that is considered very poor. However, the views of customers and care workers do not need to

be similar, because differences in views are important in innovation activities.

The reliability of this study was increased by looking into several types of safety alarm systems, triangulation of research materials, and use of expert informants to comment on the results. Future studies will focus on ageing people and care workers as innovators, as well as on other types of innovative ‘hybrid care’ (other than safety alarms), where the core of the supply is a combination of service and product – both elements being vital. Further research is needed on such combinations that are becoming more and more important, along with increasing attention to service science. Further research is also needed on connections between different service systems (maybe even very distant or seemingly irrelevant ones) including potholes and innovation opportunities lying in those.

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Definition of Age Business Core Process in a Regional Innovation System. *Regional Studies*.
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Policy Debates

Building Regional Innovation Networks: The Definition of an Age Business Core Process in a Regional Innovation System

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PEKKARINEN S. and HARMAAKORPI V. (2006) Building regional innovation networks: the definition of an age business core process in a regional innovation system, *Regional Studies* **40**, 401–413. Regional innovative capability is a crucial factor in building regional competitive advantage under the present techno-economic paradigm. Defining and promoting the multi-actor innovation networks that form the regional innovation system is essential. In the present study, the Regional Development Platform Method and core process thinking are presented as innovative tools in developing regional innovation systems. The focus is on the definition of the age business innovation network as a core process of the Lahti (Finland) regional innovation system. The main conclusion is that the success of a core process is essentially based on collective learning and knowledge creation among the actors.

Regional innovation systems Innovation networks Innovation policies Ageing of the population

PEKKARINEN S. et HARMAAKORPI V. (2006) La construction de réseaux d'innovation régionaux: la définition d'un processus de base dans le commerce gris au sein d'un système d'innovation régional, *Regional Studies* **40**, 401–413. La capacité régionale d'innovation est un acteur primordial dans la construction de l'avantage compétitif régional. sous le paradigme techno-économique actuel. Définir et promouvoir les réseaux d'innovation à plusieurs acteurs qui font partie intégrante du système d'innovation régional est capital. Cette étude cherche à présenter la Regional Development Platform Method et la pensée sur les processus de base en tant qu'outils innovateurs du développement des systèmes d'innovation régionaux. On met l'accent sur la définition des réseaux d'innovation dans le commerce gris comme processus de base du système d'innovation régional à Lahti (en Finlande). A titre de conclusion principale, on affirme que la réussite d'un processus de base s'explique essentiellement par la création de l'apprentissage et de la connaissance collectifs parmi les acteurs.

Systèmes d'innovation régionaux Réseaux d'innovation Politiques d'innovation Vieillesse de la population

PEKKARINEN S. und HARMAAKORPI V. (2006) Aufbau regionaler Innovationsnetzwerke. Definition eines zeitgemässen Betriebskernprozesses in einem regionalen Innovationssystem, *Regional Studies* **40**, 401–413. Die Innovationsfähigkeit einer Region ist ein entscheidender Faktor beim Aufbau eines regionalen Wettbewerbsvorteils nach derzeitigem technowirtschaftlichen Muster. Definition und Werbung für Innovationsnetzwerke mit verschiedenen Beteiligten, die das regionale Innovationssystem bilden, ist wesentlich. In der vorliegenden Studie werden die Methode der regionalen Entwicklungsplattform und Überlegungen zu Kernverfahren als innovative Werkzeuge bei der Entwicklung regionaler Innovationssysteme vorgeführt. Im Brennpunkt steht die Definition des zeitgemässen Betriebsinnovationsnetzwerks als ein Kernprozess des regionalen Innovationssystems von Lahti (Finland). Die Hauptschlusfolgerung läuft darauf hinaus, daßer Erfolg eines Kernprozesses sich wesentlich auf kollektives Lernen und Kenntnisvermehrung unter den Beteiligten stützt.

Regionale Innovationsverfahren Innovationsnetzwerke Innovationsbestrebungen Altern der Bevölkerung

PEKKARINEN S. y HARMAAKORPI V. (2006) Creación de redes de innovación regional. Definición de un proceso central para negocios para la tercera edad en un sistema de innovación regional, *Regional Studies* **40**, 401–413. La capacidad de innovación regional es un factor fundamental para crear una ventaja competitiva a nivel regional bajo el actual paradigma tecnoeconómico.

Es de vital importancia definir y fomentar las redes de innovación con muchos protagonistas que forman el sistema de innovación regional. En el presente estudio, el Método de Plataforma de Desarrollo Regional y el pensamiento de los procesos centrales se presentan como herramientas innovadoras para el desarrollo de los sistemas de innovación regional. Aquí nos centramos en la definición de la red de innovación comercial para la tercera edad como un proceso central del sistema de innovación en la región de Lahti (Finlandia). Llegamos a la principal conclusión de que el éxito de un proceso central se basa primordialmente en el aprendizaje colectivo y la creación de conocimientos entre los diferentes protagonistas.

Sistemas de innovación regionales Redes de innovación Políticas de innovación Envejecimiento de la población

JEL classifications: D85, J14, O31, R58

INTRODUCTION

In the present Schumpeterian world, innovations are widely seen as the driving force of economic growth and competitiveness. The innovation environment is, however, facing remarkable challenges where regions have to maintain and develop their well-being in global competition under the rules of absolute competitiveness (PORTER, 1990; CAMAGNI 2002). The traditional innovation policy has often focused on promoting science and technological policies. These policy models have typically believed in the science push effects in radical innovation processes. The new innovation environment, however, sets new demands for regional innovation policies and strategies. Innovation cannot be seen as a property of science or technology-based firms; it is the basis of competitiveness in all kinds of economic activities. The innovation processes are increasingly embedded in normal social and economic activities (KLINE and ROSENBERG, 1986; LUNDVALL, 1988; SCHIENSTOCK and HÄMÄLÄINEN, 2001). The source of innovation is often the interaction of different actor-networks comprising users, producers and related development organizations. Therefore, it seems a crucial task for regional innovation policies and strategies to promote innovation in a multi-actor environment to take advantage of locally bounded spillovers.

The present techno-socio-economic paradigm stresses the importance of social aspects of networking and clustering. Agglomeration economies (cf. MARSHALL, 1916; CHRISTALLER, 1933; LÖSCH, 1954; CHINITZ, 1961; KALDOR, 1970; HENDERSON, 1985) are nowadays seen less as a result of economics of scale and production and market indivisibilities and more as a result of locally bounded knowledge spillovers (KRUGMAN, 1991; LUNDVALL, 1992) being closely related to interactive multi-actor innovation processes. Firms cooperate with public, semi-public and private institutions leading to the creation of different regional institutional schemes of partnership (COOKE, 1998; COOKE and MORGAN, 1998). The social collaboration in these networks is said to decrease transaction costs, correct market failures and decrease the risks of the interacting partners leading to increased productivity. Thus, the advantages of agglomeration seem to be less dependent

on traded interdependencies than earlier. Untraded interdependencies are increasingly the source of competitiveness and innovativeness in today's world (STORPER, 1995).

This point of view has been strongly emphasized in the influential frameworks of industrial districts (MARSHALL, 1932, BECCATINI, 1990; PYKE and SENGENDERGER, 1992, etc.) and innovative milieux (AYDALOT and KEEBLE, 1988; CAMAGNI, 1991; CREVOISIER and MAILLAT, 1991, etc.). Social collaboration and networking are also at the heart of the recent discussions dealing with regional innovation systems. The regional innovation system (COOKE *et al.*, 1997; STORPER, 1997; BRACZYK *et al.*, 1998, DE LA MOTHE and PAQUET, 1998; DOLOREUX, 2002) consists of different innovation networks aiming at increasing the innovativeness of the regional innovation environment. These networks have many different forms being defined by, for example, the origin, size, structure and objective of the networks (HARMAAKORPI *et al.* 2003b). However, regional innovation networks are often formed from a heterogeneous group of various actors including representatives of firms, universities, technology centres and development organizations. The ability to interact in these networks becomes a decisive success factor in promoting innovative capability (SOTARAUTA and VILJAMAA, 2002; HARMAAKORPI *et al.*, 2003b).

The growing importance of regional multi-actor innovation networks thus seems to be clear, but it is far from clear what kind of policy implications should be used to promote such networks. In this paper, the Regional Development Platform Method (RDPM) is presented as a tool for the regional innovation policy under the reigning techno-socio-economic paradigm. The actual scope of the study is to present the implementation of the seventh phase of the RDPM: the definition of a core process of a regional innovation system. The core processes of a regional innovation system aim to exploit the potential existing in the defined regional resource configurations – regional development platforms – and enhance the formation of regional dynamic capabilities in the innovation networks founded. The definition of the 'age business core process' in the Lahti region in Finland is presented as a case study.

REGIONAL DEVELOPMENT: THE PLATFORM METHOD AND THE CONCEPT OF THE CORE PROCESS

Regional strengths and potentials play an important role in creating future innovation and technology strategies. In this paper, the RDPM is presented as an organizational innovation for a regional innovation policy (HARMAAKORPI and PEKKARINEN, 2002; HARMAAKORPI, 2004). The method helps to look for regional business potentials on which it is possible to build the future competitive advantage of a region. The dominating idea of developing the RDPM has been the importance of the individual regional development paths in designing development strategies. In the RDPM, the strategies are based on a thorough assessment of regional resources, capabilities and competencies, and future opportunities leading to business potentials, which can give a region a competitive advantage. An essential part of the method is the core process thinking, which is designed to form innovation networks aiming at exploiting the business potentials existing in the regional development platforms. Moreover, the RDPM can be seen as a network leadership tool helping the regional actors to interact during the development process, as well as helping to promote dynamic capabilities and creative social capital in a region.

The RDPM uses the concept of a regional development platform as a tool for seeking regional business potential. The concept has its intellectual roots in the frameworks of regional innovation systems and evolutionary economics. It is strongly bound to the institutional set-up of a region and can, therefore, be a useful tool in exploring existing business potentials in manifold regional resource configurations. The concept of regional development platforms is related to the concept of clusters. However, regional development platforms aim to describe the potentials that can form future regional clusters of the existing resource base rather than describe existing clusters. Regional development platforms can be defined as 'regional resource configurations based on the past development trajectories, but presenting the future potential to produce competitive advantage existing in the defined resource configurations' (HARMAAKORPI and PEKKARINEN, 2003, pp. 8–9).

The RDPM consists of eight phases:

- Benchmarking through the assessment of regional innovation system theories and conventions.
- Background study of the industries and areas of expertise in the region.
- Expert panels.
- Assessment of future scenarios.
- Analysis of statistical and empirical information.
- Conceptualization of the regional innovation system.
- Search for the core processes of the regional innovation system.

- Definition of the knowledge creation and management system.

The focus of this paper is on the seventh phase aiming to form innovation networks to exploit the potential regional resource configurations. The core processes of the regional innovation system are defined as: processes aiming at exploiting the potential existing in the defined development platforms and enhancing dynamic capabilities in a region. The aim is to create and develop regional core competencies and creative social capital creating sustainable, competitive advantage for a region. The core processes are based on the identified potential development platforms in a region. They can also include some phenomenon or future megatrend seeming to bring business opportunities for the firms in the region. They are defined by the main actors of the region, and it is important that the actors are willing to invest resources to develop the core process. The core processes are actually thematic or sectoral regional innovation networks where the central objective is collective learning.

The core processes are characterized by certain conditions:

- Important regional firms are among the exploiters of the core process.
- Core process can create new business activity.
- There are strong enough actors for each sector of the core process.
- It is possible to name responsible organizations and people for each sector of the core process.
- Actors of the core process can agree on common goals and a course of action.
- Actors of the core process can name a credible 'owner' of the process.

The task of the owner of the core process is to keep it moving and develop it further. Actors whose activities and interests may be quite different can participate in the process. The task of the owner of the core process, however, is to gather around him or her a strong enough core group that keeps the process viable. Creating business takes place, for instance, as a group action and as a result of the product development projects emerging from the process. In the projects, there can be experts from different industries and development organizations working together for a new product or service.

The role of the core process thinking is absolutely central in the RDPM. It lays the real foundation for the concrete actions in running the regional innovation systems after the most potential regional development platforms are defined. The potential regional development platforms based on the core processes as new institutions make it possible to prevent and unlock the possible lock-ins, as well as lead the way to new regional paths. The aim is also to create innovation networks with enough critical mass allowing the benefits of

agglomeration to take place. The core processes form the basis for the development of bonding social capital in the thematic and sectoral innovation networks. These networks have their foundation in the regional innovation system, but they can also be developed independently from the fetters of the regional system whilst paying attention to the surrounding networks and using the opportunities given by the multilevel governance structure. Only if the core processes possess enough bridging social capital (GRANOVETTER, 1985; PUTNAM, 1995) can they develop sufficient absorptive capacity and avoid harmful lock-ins caused by collective blindness (TURA and HARMAAKORPI, 2005; HARMAAKORPI, 2004).

Fig. 1 describes a principle of a core process formed by a combination of industries, areas of expertise and future megatrend.

CASE STUDY: DEFINING A CORE PROCESS IN THE LAHTI REGIONAL INNOVATION SYSTEM

The Lahti region

The Lahti region is situated in Southern Finland, about 100 km from Helsinki. It comprises 12 municipalities; and has about 200 000 inhabitants, equivalent to 4% of the Finnish population. By the end of the 1990s, it had become quite clear in the Lahti region that the region was having difficulty moving from the industrial era to the information era. Following the collapse of the national economy at the beginning of the 1990s, the unemployment rate, in particular, has remained very high. Nor has industrial modernization been sufficiently successful. Irrespective of the fact that Lahti is situated only 100 km from Helsinki, which is one of the most dynamic economic centres in Europe, it has

been unable to create enough employment in the knowledge-intensive sectors in the area.

The Lahti region has lacked the features producing science-based innovations as the source of regional competitiveness, productivity and economic growth. The regional competitiveness needs to originate from some other kind of innovation activities. Due to the strongly industrial history of the Lahti region, it has been predicted that the region might be able to form some competitive resource configurations based on the traditional industries and the regional areas of expertise if these resource configurations were modernized and the demands of the changing techno-economic paradigms taken into account. There was a clear need for the new development tools and new socio-institutional arrangements so as to create new paths for regional development. The RDPM was considered suitable for developing the regional innovation system in order to define the most potential regional configurations and enhancing the dynamic capabilities leading to the effective exploitation of these resource configurations.

Megatrend of ageing and the age business

Besides regional industry or expertise-based platforms, the RDPM takes into account world- and nationwide megatrends. The ageing of the population is such a powerful megatrend that it cannot be ignored when planning for the future competence and production structure. As a consequence of the ageing of the population, the demand for welfare services and products will both increase and change. It is estimated that in Finland there will be five times more people over 80 years of age in 2050 than at present (RAUHALA, 1999, p. 6).

The idea of the age business is based on the evaluation that elderly people will not be merely consumers

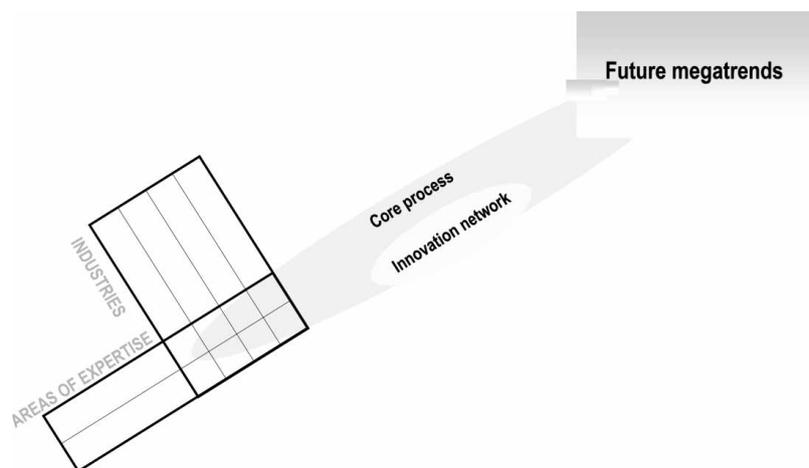


Fig. 1. Principle description of a core process

of society's resources, but a growing number of them will actively participate in the economy and other activities just like other citizens (e.g. SONKIN *et al.*, 1999, p. 24). The pension purchasing power will grow considerably, so that even pensioners receiving an average pension will be able to pay for a larger share of the production costs of the social and welfare services (HJERPPE *et al.*, 1999). In the future, the clients of well-being technology and services seem to be more often the end-user themselves, and not just the public service system (e.g. ANTTILA, 2000, p. 15; SAVELA and HAKULINEN, 2001).

The former lifestyle guides consumers' behaviour. Those who are used to consuming when young and healthy will continue doing so as they get old and sick. The third age (LASLETT 1989) between the active working age and late old age, where the healthier and wealthier people are forming a new consumer group, is emerging. The increase of individuality leads to a need for individual services, and mass products will no longer be of such interest as before. The markets will need information on the needs and consumer habits of the elderly in order to create space and opportunities for new entrepreneurial activity, in which the elderly are seen as consumers and target groups better than before (SONKIN *et al.*, 1999, p. 58).

Firms have so far not been too keen to target their products at movement-impaired people, because the markets have been considered limited and for fear that the image of the enterprises would suffer. Designing accessible products does not, however, mean that they should be marketed as special assistive equipment. Everybody would profit from well-designed accessible technology (HYPPÖNEN, 2000, p. 15). Furthermore, it would be harmful for the image of the firm if it were perceived to be a producer of complicated technology, which does not take all users into account, especially if the competitors' design products fit for all. Therefore, the question is ethical (HYPPÖNEN, 2000, p. 15), as well as commercial. As the population gets older, a decreasing number of people fit in the mould of an average user. In this context, the concept Design For All is applied, meaning that the environment responds to the needs of as many user groups as possible without the need for adaptation or specialized design. Many practical measures, aside from a social policy commitment, are needed here. Central actors are, for example, decision-makers, research and development institutes, data and communication technology industries, and assistive equipment industry. (RAUHALA-HAYES *et al.*, 1998, p. 71.)

Age business means business and service activity that serves the needs of elderly people without treating and labelling them as a special group. The term could as well be 'age-sustainable business' taking into account the needs of customers and consumers of all age groups. Age business includes all the technology, services and business that promotes, supports and maintains a

person's everyday life, health, social well-being and communication with the environment (HARMAAKORPI *et al.*, 2002, p. 30). Elderly people can profit from the age business in maintaining their physical, cognitive and psychological abilities, in their household chores, in their free-time activities, etc. Age business means both the production of goods and technologies, as well as various types of services. The technological basis can be, for example, in nutrition, textile and construction technologies, as well as in information technology, nanotechnology, biotechnology, intelligent materials or robotics. The service sector of age business includes various types of services from social and health services to culture and travel services. People can have various types of domestic help from public and private service producers. Healthcare can be organized by a visiting nurse and it is also possible to have cleaning services, shopping services, meal services, hairdressing services, massage services and other physiotherapy services in the home environment (HARMAAKORPI *et al.*, 2002, p. 31). There is also likely to be a growing demand for high-level products of low-level technology, and integral accessible solutions will increase in value (SAVELA and HAKULINEN, 2001, p. 40).

New markets for technology and service products are emerging to promote and support health and independent living for the elderly, and to complete and substitute the traditional social and health services. The level of know-how is very high in Finland in the firm, research and user sectors, but it is very scattered. The challenge is to achieve better cooperation between the sectors (e.g. SARANUMMI, 2001). Developing new technology and service solutions can be described as a network made up of producer and client parties and social actors who participate in making the rules of the game for the industry (Fig. 2). Developing successful well-being products requires all kinds of know-how that combines research in the social and well-being sector, management of production and services, etc., without forgetting the end-user him- or herself, who is a valuable source of information. The actors of the development process may have little knowledge in common, but still the collaboration of a number of competences and cultures is required (CAPECCHI, 1996, p. 178).

Age business and the Lahti region

The development work of successful well-being products requires actors both from the social and health sector and traditional industrial production. In building the well-being and age business cluster for the Lahti region, it is well worth taking advantage of the already existing industrial structure, in which traditional manufacturing industries still hold a steady position. The analysis of the regional development platforms showed that the Lahti region rises above the national averages

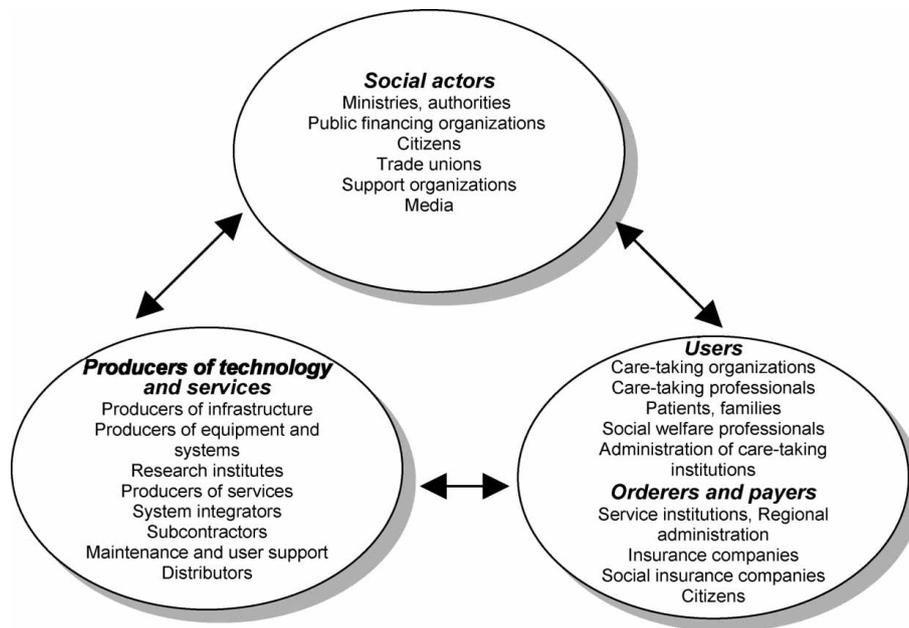


Fig. 2. Parties to the well-being market network
Source: SARANUMMI (2001, p. 3)

when seen through different indicators in the plastics, metal, as well as furniture industries. The most important potentials might be found in the combinations of the 'star' industries and areas of expertise combined with a justified view of the future techno-economic development. An interesting combination in the case of the Lahti region could be, for example, furniture, plastics and metal industries combined with design expertise and the ageing of people. There are a number of promising combinations whose development could be helped by promoting the existing or emerging innovation networks in the defined development platforms.

Cooperation networks in the well-being sector. In order to lay a foundation for a regional age business core process, a survey and a few interviews were conducted in spring 2002. The main object of the study was to see if the organizations operating in the well-being sector, on the one hand, and the enterprises in the traditional manufacturing industry, on the other, have the potential to cooperate in developing new well-being products and, finally, if the age business seemed to be reasonable to formulate as a core process in the Lahti region.

The survey was conducted by sending a questionnaire to 35 different organizations operating in the Lahti region that mostly represented the public and third sectors and were considered to be, one way or another, connected with the ageing of the population. It was sent, for example, to the social and health

authorities of different municipalities and educational organizations in the region. Twenty-four organizations, or 68.6% in all, replied.

The object of the survey was to map the organizations working in the well-being sector, the know-how they possessed, their cooperation networks and their development suggestions for intensifying cooperation. The survey also mapped new ideas for products and willingness to participate in developing well-being products together with actors from other industries.

According to the section on projects in the survey, there are at least 50 projects being implemented in the region regarding well-being and the ageing of the population. The projects include research, education and development of work with the elderly, home help service, rehabilitation, product and service concepts, service intermediation, accessible environment and well-being technology. There is plenty of other know-how and activities related to ageing in the region, of which an example is the professorship in social gerontology of the University of Helsinki. There is also know-how derived from projects already carried out, of which many are continued in some other form. There is also an extensive amount of new planning activity in progress.

One of the objectives of the survey was to explore the mutual cooperation networks among the well-being sector actors. The questionnaire asked which cooperation partners the well-being organizations of

the region had, what was the nature of the cooperation and how intensive it was. The question produced data on the relations between the actors, and the material can be analysed through the network analysis methods. With the help of the analysis, the material can be used to define the amount of interaction between the organizations, search for clusters that are active in development work, and recognize central and leading actors. These objectives are reached by means of three key elements: density, centralization and centrality. The cooperation networks were analysed using the Ucinet IV network analysis program (HARMAAKORPI and PEKKARINEN, 2003).

Various interaction patterns could be deduced from the material using the Pajek Programme. Fig. 3 shows an interaction network between the actors regarding interacting that was reported to be taking place at least once a month. The nature of the interaction can be joint projects, the planning of joint projects, representation in the steering group or administrative bodies, or exchange of information and/or other cooperation. Contacts as a whole take place seldomly: over half the respondents told that cooperation takes place only a few times a year or less.¹ On the other hand, there were also contacts almost daily.

The key actors of the network – organizations that have most contacts at least once a month with other

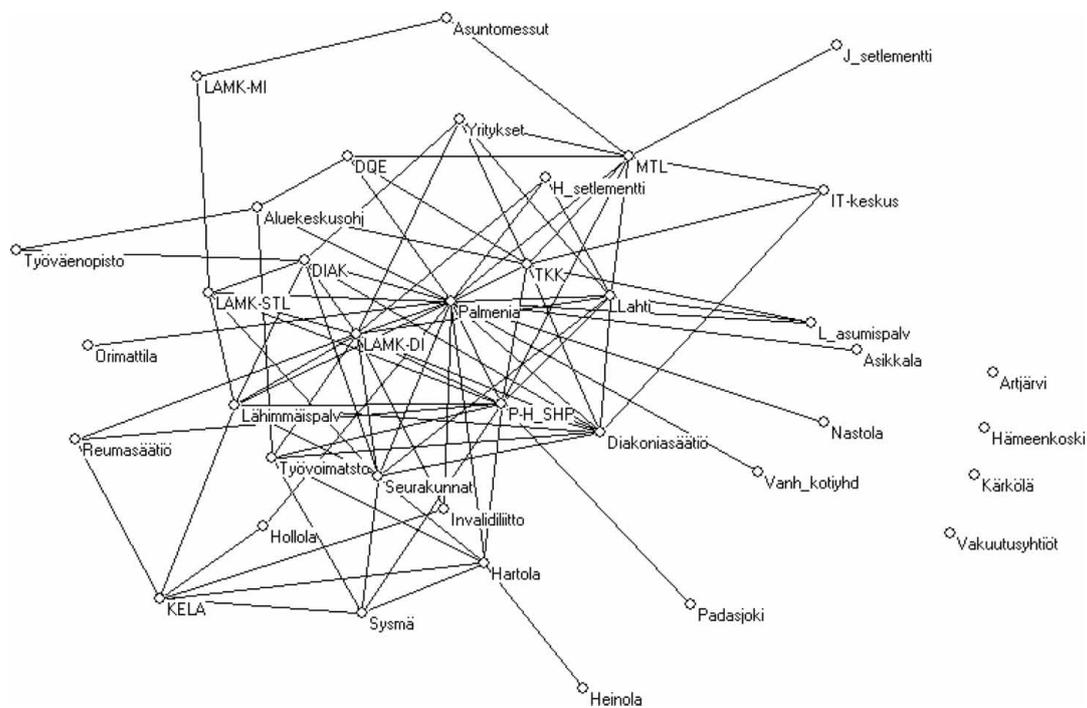


Fig. 3. Network of actors in different forms of cooperation

Aluekeskusohj, Regional Development Centre Programme of the Lahti Region and Centre of Excellence on Social Welfare in Southern Finland; Artjärvi, social and health service of the Municipality of Artjärvi; Asikkala, social and health service of the Municipality of Asikkala; Asuntomessut, Housing Fair in Heinola; DIAK, Diaconia Polytechnic of Lahti; Diakoniasäätiö, Lahti Deaconry Foundation; DQE, Design, Quality, Ecology, Centre of Expertise Programme; Hämeenkoski, social and health service of the Municipality of Hämeenkoski; Heinola, social and health service of the City of Heinola; Hollola, social and health service of the Municipality of Hollola; Invalidiliitto, Adaptation Training Centre for the Disabled; IT-keskus, Lahti IT Centre; J_Setlementti, Settlement Movement of Jyränkölä; Kärkölä, social and health service of the Municipality of Kärkölä; KELA, The Social Insurance Institution of Finland, Lahti Office; L_ Asumispaiv, Liipola Residential Services; Lähimmäispalvelu, Lahden Lähimmäispalvelu, registered association; Lahit, social and health service of the City of Lahti; LAMK-DI, Lahti Polytechnic, Institute of Parish Social Services; LAMK-MI, Lahti Polytechnic, Institute of Design; LAMK-STL, Lahti Polytechnic, Faculty of Social and Health Care; MTL, Institute for Design Research; Nastola, social and health service of the Municipality of Nastola; Orimattila, social and health service of the City of Orimattila; Padasjoki, social and health service of the Municipality of Padasjoki; Palmenia, University of Helsinki, Palmenia, Centre for Research and Continuing Education; P-H SHP, Päijät-Häme Hospital District; Reumasäätiö, Finnish Rheumatism Foundation, Heinola; Seurakunnat, The Congregations in the Region; Sysmä, social and health service of the Municipality of Sysmä; TTK, Helsinki University of Technology, Lahti Center; Työväenopisto, Lahti Adult Institute; Työvoimatoimisto, Lahti Employment Office; Vakuutusyhtiöt, insurance companies; Vanh_ kotiyhd, Old People's Home Association of Lahti; Yritykset, enterprises in the well-being sector

organizations – seem to be: the University of Helsinki; Palmenia Centre for Research and Continuing Education, the Päijät-Häme Hospital District, Lahti Deaconry Foundation, Diaconia Polytechnic of Lahti; and Lahti Polytechnic: Institute of Parish Social Services.

In the opinion of the majority, the cooperation has worked well, even though it must be noted that many are just in the initial stage of cooperation. In some of the answers, the respondents hoped that the cooperation would take a concrete form and complained about a lack of resources. They hoped that regional cooperation would increase regarding the exchange of information (e.g. disseminating the results of basic research) and regarding awareness of the activities of other entities in order to avoid overlapping. The wishes for the future concerning the contents of cooperation had to do, for instance, with creating a service system for the elderly, quality projects, product development, other development work research, testing, education and enhancing user friendliness.

Cooperation between social sector and other industries. The well-being sector actors were asked in the questionnaire if they saw a chance of cooperation in developing new products or services together with the traditional industries of the Lahti region. The answers to this question were as follows (Table 1).

In general terms, developing new products and services in cooperation with other industries was conceived as being very possible. The suggestions for products and services included things that would make it easier to cope with everyday life, such as assistive technology, intelligent furniture and, in general, supporting living at home with technology (information transfer, control and monitoring), dressing, flexible domestic services, as well as new specific services and coordinated service packages.

The last question in the questionnaire was about how to organize the development work among the different actors. There was, for instance, a suggestion to get the actors to develop new product concepts, so that there

would be a continuation around the products already made and those in the making in the form of new projects. Good coordination was considered an important factor: many of the answers mentioned that there should be one clear actor that would direct the development and put the cooperation in practice. Geographical closeness of the actors was also considered important in enhancing cooperation.

It is the task of the regional innovation system to increase regional innovative capability. Since innovations are mostly carried out in firms of the region, the key is having the firms to commit to the objectives of the core process. As part of this process, ten people in eight of the regional firms were interviewed. The sample is very small in comparison with the firms of the region that could possibly exploit the age business. However, the sample was considered big enough to give an idea of the regional potential of the core process of the age business. The firms interviewed represented the plastics, construction, furniture, vehicle, clothing, medical furniture and indoor climate product industries. The firms will be gone through more thoroughly when the core process is started. The question put to the firms in the interview was: Can you see any business development opportunities for your firm by means of products and services produced for the elderly, and will the core process described be able to help your firm in exploiting these opportunities?

The firms had clearly recognized the trend of the ageing population, and everywhere the phenomenon had been reflected on. The core process described was felt to be sensible and its further development was encouraged. On the other hand, in such a short encounter, it was not possible to give the matter concrete form, so the real degree of commitment of the enterprises will be seen when the core process gets underway. Some of the most important matters that needed development in the age business, according to those interviewed, were design, ergonomics, developing norms and standards and studying consumer habits, for instance, by means of research on behaviour and lifestyles.

Starting the age business core process in the Lahti region

According to the studies conducted, the age business core process seems to be a potential core process in the Lahti region. This is supported especially by taking the well-being industry as the core of the Regional Development Centre Programme in the Lahti region. This creates the basis for both human and financial resourcing of the core process. Indeed, it is quite a natural solution that the Regional Development Centre Programme, and, in practice, its director, be the owner of the age business core process. The location of the Regional Development Centre Programme at Neopoli Oy Corporation further supports this solution; Neopoli Oy is in charge of coordinating the Lahti region science park.

Table 1. Perception of possibilities of cooperation with other industries

	Yes	No
(a) Plastics industry	9	3
(b) Wood and furniture industry	12	3
(c) Metal industry	8	4
(d) Textile industry	9	3
(e) Other suggestions:	1	
Transport		
Commerce:	1	
Social sector	1	
Services	2	
Information technology sector	3	

In the Lahti region, the start-up seminar for the core process was organized. The number of participants was 66, and they came from different actor groups. In the seminar, the core process thinking was presented and the opportunities offered the Lahti region by the age business were discussed. The participants considered the future of the age business to be promising and agreed to put the age business core process into practice in the Lahti region. The participants were also asked to complete a questionnaire that surveyed their opinions about core process thinking and the development of the age business core process. Thirty-two questionnaires were returned.

The participants were asked to evaluate on a scale of one to five, where one is the worst and five the best score, how well the core process thinking works in creating the age business network. The average value of the answers was 4.2. They were also asked, using the same scale, to evaluate the opportunities of the age business in the Lahti region. The average of the answers to this question was 4.3. Based on this, the age business core process got a favourable reception among the actors. All the respondents were willing to participate actively in the development of the age business core process or at least to follow the development of the process.

The questionnaire also mapped out the participants' ideas for good ways to develop further the age business core process. The respondents recommended developing the education and training possibilities in the field of welfare and ageing, also including awareness of the business potential that the phenomenon of ageing brings. They also recommended carrying out market research about the needs of the elderly and including the elderly themselves in the age business core process.

According to the respondents, it would be especially important to arouse the interest of the firms in the region by pointing out their opportunities to create new business with the age business core process. It was suggested that the age business thinking would be worth expanding into new types of firms, such as co-operatives and social firms. It was considered important to encourage and maintain the cooperation between actors from different sectors to attract diversified expertise for this multidisciplinary phenomenon. It was suggested that regular meetings – especially working in small groups – should be arranged.

The central actors of the age business core process are presented in Fig. 4.

DISCUSSION

In the beginning of the 1990s, the Lahti region was in an awkward situation because its regional competitiveness was significantly threatened. As an old industrial region it had begun to decline and the region had serious problems transforming itself from the industrial

era to the information era. During the 1990s, a large consensus that knowledge creation and innovativeness should be heavily promoted in the region had emerged. Because of the lack of a regional innovation policy, the regional innovation system had been formed randomly and nobody really knew what it was and where it should be steered. This set-up led to the development of RDPM and core process thinking as a central content of the innovation policy in the Lahti region.

What are the actual effects of core process thinking on the Lahti region? The main effects are the changed patterns of acting and increased awareness of the regional innovation system and its importance for the region. Earlier there were some randomly working organizations trying to enhance the entrepreneurial activities of selected sectors. The main change from the earlier situation has been the active creation of regional multi-actor innovation networks by the core processes.

The recent strategies in the region are based on the RDPM and core process thinking (LAHDEN KORKEAKOULUTYÖRYHMÄ, 2002; HARMAAKORPI *et al.*, 2003a, 2004; PÄIJÄT-HÄMEEN LIITTO, 2003a, b). Because the core processes are the main method of funding the development of the regional innovation system, a good foundation is laid for further development.

The realization of the core processes in the Lahti region is so recent that it is too early to say what are its effects in terms of concrete success. Many such indicators have been favourable to the region in the past 2 or 3 years, but it would be naïve to try to estimate what is the role of the core process thinking in this process. It is certain, however, that it has changed the innovation policy in the region and in that sense it has responded well to the demands placed on it.

The core process thinking can also be criticized based on the experiences gained in the Lahti region. In the Lahti region, some of the core processes have started very well while some are still struggling in the starting phase. The tool can also be criticized because there is a danger of trying to change too much in too short a time. It is quite a leap from conventional industry-based development strategies to the core process thinking, and it has obviously been difficult to assimilate in some circles. There has also been some criticism that it is somewhat difficult to explain to outsiders how this new type of innovation policy in the Lahti region works because of the very many new terms and concepts.

The age business core process started well. The continuation, however, has not been 100% satisfactory. Collective learning is seen as an important success factor in regional innovation systems (e.g. KEEBLE *et al.*, 1999; LAWSON and LORENZ, 1999). The core process has met with problems in the practical creation of collective learning processes in the innovation

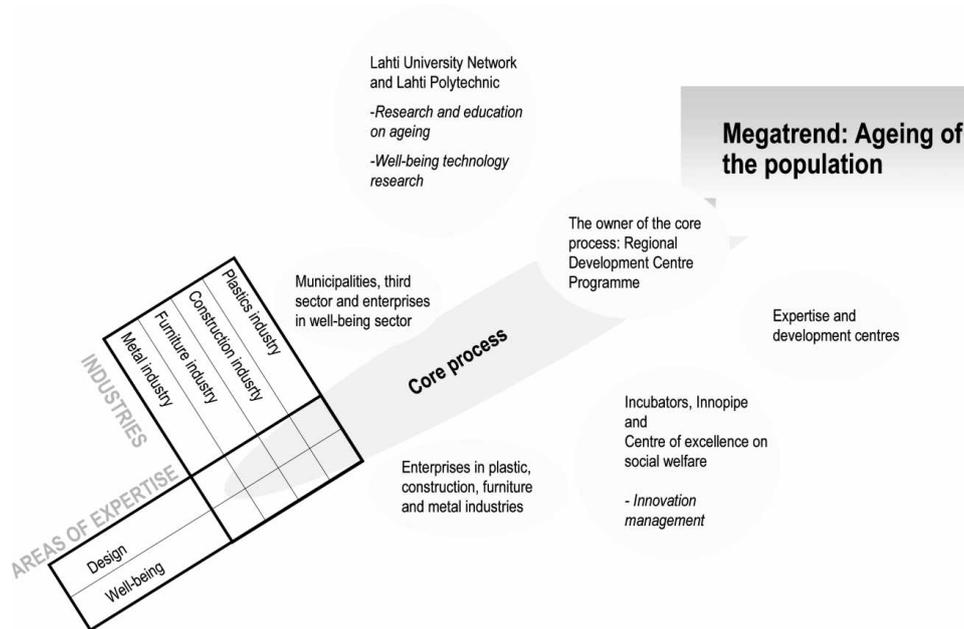


Fig. 4. Central actors of the age business core process

networks.² The role of collaboration is especially important in the age business core process, which has not only to do with the market logic, but also improves the quality of life of those who have the greatest disadvantages and difficulties. There is a great range of actors, needs and working cultures in this kind of process (CAPECCHI, 1996, pp. 189–190). It was seen that although clustering and networking are important factors in creating regional competitive advantage, the real competitive advantage of regional innovation networks is based on their ability to create knowledge in a collective and interactive learning processes. As KEEBLE *et al.* (1999, p. 330) note, the preconditions of collective learning – regional, culturally based rules of behaviour, engagement and collaboration – have to be established to build a regional capacity for collective learning. However, the learning processes seldom occur totally spontaneously and they need to be aided by regional policy measures. Therefore, special attention was directed at knowledge creation and management at the regional level. That task is fulfilled in the last phase of the RDPM where a concrete tool – the so-called rye-bread model – for knowledge creation and management in the core processes of the regional innovation system has been applied (HARMAAKORPI and MELKAS, 2005). The model has its origins in the SECI/ba model of Nonaka and colleagues (NONAKA and TAKEUCHI, 1995; NONAKA and KONNO, 1998). The created model is shown in Fig. 5.

One special task of the core process and the rye-bread model is to enable better cooperation between knowledge generation and the diffusion subsystem and knowledge application and the exploitation subsystem (AUTIO, 1998, pp. 133–134) in regional innovation generation by bringing together the actors of both subsystems in the same knowledge creation and innovation process.

CONCLUSIONS

Increasing innovative capability is a crucial factor in building regional competitive advantage under the present techno-economic paradigm. Regional innovative capability is formed by the innovative capability of the regional actors and their cooperation in innovation processes. The interactivity and non-linearity of the innovation processes have been emphasized lately. The creation of innovations is seen to be a deeply socially embedded process taking place in normal social and economic activities, in which collective learning is considered to be one of the most important success factors.

Characterizing innovation as a social, non-linear and interactive learning process raises the question of the role of socio-cultural structures taking place in the innovation processes. The socio-institutional environment where innovations occur plays an essential role in successful innovation processes. The regional innovation system consists of different innovation networks

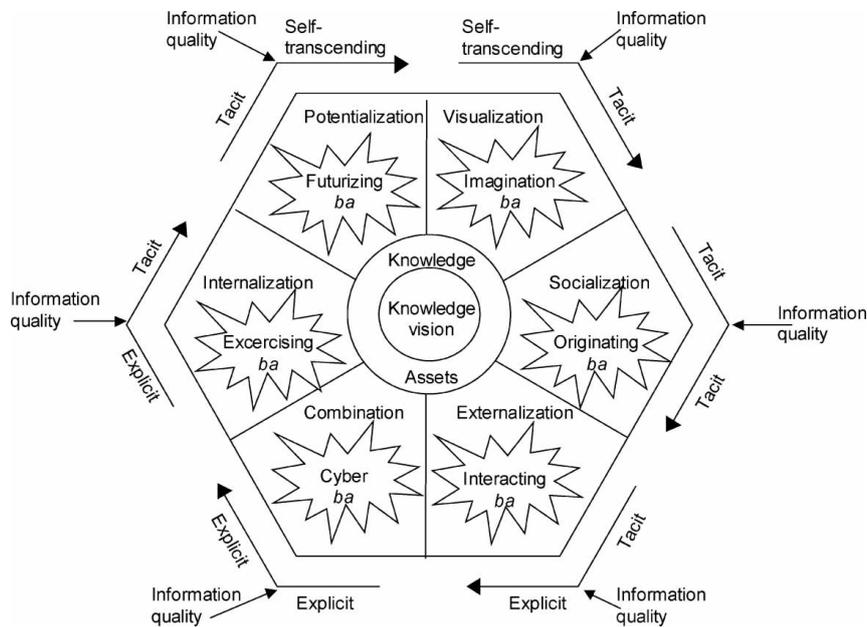


Fig. 5. 'Rye-bread model' of knowledge creation
 Source: HARMAAKORPI and MELKAS (2005)

aiming to increase the innovative capability of the milieu. Regional innovation networks are often formed from a heterogeneous group of different actors including member of firms, universities, technology centres and development organizations. Regional innovation networks are based on regional assets and form structures where agglomeration economies take place at a regional level.

In the present study, the RDPM was presented as an innovative method to explore and exploit the best business potentials in a networked regional development environment. Particular stress is placed on the definition of core processes in the regional innovation system. Core processes include regional multi-actor innovation networks formed to exploit the commonly defined and accepted resource configurations in a region. The core processes can be very different in their nature. They can be based on some strong industry, area of expertise or on a combination of them. They can also be based on some phenomenon or future megatrend seeming to bring business opportunities for the companies in the region.

The definition of the age business core process in the Lahti region was presented as a case study. The core process is based on the fact that the ageing of the population provides new business potential for companies and new challenges for regions globally. The aim was to find out if the ageing megatrend would give new opportunities to build a competitive advantage for a

place such as the Lahti region. The second aim was to give a practical form to the innovation network of the core process in order to begin to exploit the opportunities offered by the megatrend and the regional assets. In the start-up seminar for the age business core process, the evaluation indicates that the RDPM, core process thinking and the age business core process got an extremely favourable reception among the actors, showing wide acceptance of the development tool used. Especially encouraging was the fact that all the respondents were willing to participate actively in the development of the age business core process or at least follow its development. The successful development of the age business core process is, however, not without problems. This present study especially emphasizes the crucial importance of enabling collective learning processes and a proper knowledge management system for the success of the core process.

Acknowledgements – The paper is based on a paper presented at the Conference of Regional Studies Association, Pisa, Italy, 12–15 April 2003.

NOTES

1. To make a clear pattern, only the answers in which cooperation was reported to take place at least once a

month were taken into account. Therefore, some of the organizations seem to have no cooperation relations, which in reality may mean that their contacts are less frequent.

2. Similar experiences with insufficient cooperation can be perceived when trying to create a New Technology District oriented towards the elderly and the handicapped in the Bologna Region of Italy (CAPECCHI, 1996, pp. 188–189).

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