Towards resident-oriented housing modernisation with collaborative design
KATJA SOINI

FACILITATING CHANGE

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"The dance of the big and
the small entails a new kind
of design. It involves a new
relationship between subject
and object and a commitment to
think about the consequences of
design actions before we take
them, in a state of mind-design
mindfulness—that values place,
time, and cultural difference."
(Thackara 2005, 226.)

1. Introduction

During the past decades design has intensively sought for alternative ways and fields of application. As the scope of design has expanded from individual creation of arts and crafts objects to designing industrial products based more and more on collaboration, and beyond to propelling innovations, the uses of (industrial) design have broadened from operative roles towards strategic contribution (Valtonen 2007, 280—308). One of the latest developments of the design profession has been in expanding the scope of design from within an organisation to complex systems without a clearly defined organisational home (e.g. Hillgren et al. 2011; Keinonen et al. 2013; Thackara 2005). These systems—as an object of design—pose new broadening opportunities and also more complicated challenges for design, because they are profoundly indeterminate and wicked (cf. Rittel & Webber 1973) as they deal with social and cultural meanings that are tacit, distributed and evolve all the time (Krippendorff 2006; Verganti 2009), and are often located somewhere beyond the industrial division of profit-driven activities (Gamman & Thorpe 2011).

Many design thinkers have then come to an agreement upon need for more open, inclusive and mindful approach for design to tackle complex systems (e.g. Björgvinsson et al. 2010; Brown 2009; Burns et al. 2002; Murray et al. 2010; Thackara 2005). One of the means for dealing with complex systems is collaborative design as a continuation of the empathic and participatory design tradition (Mattelmäki & Sleeswijk Visser 2010). The approach aims at uniting various stakeholders to collectively explore open-ended complex issues and to co-create innovative design objects, typically based on end-user experiences. The contribution of collaborative design is argued to be in transforming the ideas and dreams of real people, sometimes called users, to information and inspiration to be used in dialogical design and development processes (Mattelmäki 2006; Sanders & Stappers 2012). In this context, the capability of design has been introduced as a facilitation activity that makes collective making viable by combining interests (Soini 2006; Thackara 2005). Moreover, the approach provides a platform for, in addition to exploring opportunities, rehearsing futures comprising of new relationships and practices that are created in parallel (Halse et al. 2010). By being responsive with people's everyday lives, collaborative design offers possibility for designers to do their bit on the more sustainable world (Gamman & Thorpe 2011). Collaborative design as a design approach therefore aims at building a bridge between users and organisations to collectively create futures that would resonate with the people's everyday and bring value for people, organisations and society alike.

Majority of academic research activities on collaborative and participatory design has focused on this aspect of the making—to the possible ways collaboration in regards to collective creativity could be organised. Research on collaborative design typically involves methodical development on the basis of an action research setting where processes and tools are experimented in real life projects (e.g. Buur & Matthews 2008; Koskinen et al. 2012). The interest has thus been on theories, tools and processes on how to build rapport with users and how to translate that into solutions that would attract the markets or society (e.g. Halse et al. 2010; Sanders & Stappers 2012, Vaajakallio 2012).

The other side of the coin, research on understanding what happens to the outcomes of collaborative design beyond the project realm—including the quest of the co-created design objects' destiny and overall socio-technical changes over the long run—is gaining growing interest in the design literature. It was stated already in the 1990s in regard to participatory design that "[w]hile laborious to conduct, longitudinal research that studied diffusion processes after the initial project phase would contribute a great deal to this field" (Clement & Van den Besselaar 1993, 36). The more recent demand has been on building understanding on "influence of co-design on individuals, organisations and society at large" (Vaajakallio 2012, 233) as there has been more and

more interest in applying design for transforming societies (e.g. Burns et al. 2002; Thorpe and Gamman 2011; Thomson & Koskinen 2012).

Consequently, researchers have tried to explicate how the socially oriented approach can be applied in various contexts to collectively create new alternative futures through project cases (e.g. Halse et al. 2010; Keinonen et al. 2013; Sanders & Stappers 2012; Sleeswijk Visser 2009; Vaajakallio 2012). In addition to studies on the making of collaborative design, research exists on design's structural role in society such as return of investments (ROI) in design (dROI 2012), design's role in the innovation system (Thomson & Koskinen 2012), and systemic connections of design and society (Woodhouse & Patton 2004). The aforementioned research often takes a broad aspect, which does not particularly examine the connection between collaborative design and impacts. The more recent research has then introduced examination between making and consequences, namely, on the uses of collaborative design outcomes in a particular organisation, focus on innovation management, and experiments on collaborative design platforms that would support appropriation of design outcomes (Björgvinsson et al. 2012; Buur & Matthews 2008; Hasu et al. 2014).

The aforementioned research often focuses on impacts within particular communities and organisations and thus has not, yet, illustrated wider and longer connections of collaborative design. Assessment of collaborative design on a broader scope and larger scale is needed to be able to define the contribution and position of collaborative design in dealing with complex systems. In my opinion, it is an important question for collaborative design considering that design is an activity that, according to Herbert Simon's (1996, 111) well known definition, is the process by which we "devise courses of action aimed at changing existing situations into preferred ones" (also Friedman 2003, 508). Imagining futures and tangibly changing the existing situation thus have an interdependence. Moreover, design as a professionally justified activity should be able to analytically separate the act of making from identifying the actual consequences. If collaborative design cannot manage the process from making to appropriating the outcomes, its contribution substantially limits to collective activities. That does not deliver on the promise of design as an instrumental activity for change (e.g. Forty 1992; Friedman 2003; Heskett 1980), and therefore, to take a critical view, detaches itself from the tradition of design.

It seems that building understanding about the connection between collaborative design making and impacts is difficult. In my view, there exist at least three factors in why the contribution of collaborative design is difficult to evaluate. Firstly, collaborative design activities often situate in the so-called *fuzzy front end*. The purpose of design in the beginning of a development process is to explore opportunities and generate optional strategic starting points for development (Keinonen

& Takala 2006). Thus, instead of aiming at generating a finalised commodity, for example to be manufactured or marketed as a service, the design activity explores a feasible framing that should be appropriated in following concept design and product development work. Design has been seen as a strategic tool and innovation driver being part of creating corporate visions, which pushes design "from concrete to abstract tasks" (Valtonen 2007, 308). When moving beyond organisations to complex system, the impact of these abstract tasks in the fuzzy front end are even more difficult to trace.

Secondly, here the *outcomes are more likely open-ended proposals* for complex systems, which are a subject for ongoing interpretation in the following development (cf. Verganti 2009). The more open the design outcome is, at its extreme, an intangible idea composing almost entirely of information, the more complicated the evaluation of success is, because the traceability and observability of adoption of the innovation becomes lower (Rogers 2003, 13). If innovation of radical products and complex systems are compared, one can notice that the former is purposefully open-ended without determining for example price or other obligatory features during the process, but the eventual aim is to manufacture products (Verganti 2009, 184—185), whereas the latter involves open-ended aims *and* end results. Eventually, results may find their shape in products, services, social models, communications or any other relevant application in society, but typically the outcome is purposefully kept open and debatable. The concern in designing for a complex world is more likely in "how we as designers can develop practices that are always already for ongoing changes" (Björgvinsson et al. 2012, 115) instead of finding a finished solution (Thackara 2005, 213—214). Outcomes of collaborative design offer multiple applications and appropriations in the developments, and are therefore difficult to reliably break into quantifiable units that could be studied and analysed.

Thirdly, collaborative design activities are often organised in *project work* that is a specific landmark in the life cycle of design artefacts; the influence of activities of various participants in a project is difficult to evaluate when design artefacts actually have both prior conditions and later reality that cannot be constrained by the limits of a project (Krippendorff 2006). Moreover, projects have been criticised for having many shortcomings such as "top-down perspective hindering adaptation to changing conditions, the hierarchical structure adverting "legitimate" participation, the rigidity of specifications" (Björgvinsson et al. 2012, 104) that hinder appropriation of designed outcomes. Participatory design researchers Jacob Buur and Ben Matthews (2008) exemplify this challenge with a single-organisation case where participation of users and also organisation units in a project was not a sufficient guarantee for adopting the innovation in the client organisation: an innovation that was preferred by users was rejected already before

reaching the market because the business unit did not appropriate the innovation first. My practical experience in working with multi-organisation projects from over a decade has shown me that management of appropriating ideas from user-driven collaboration into organisations' internal development is even more complicated because designers or design researchers need to consider many organisations' perspectives at the same time instead of concentrating on a single company's dynamics (Dhima 2014; Heikkinen et al. 2012; Soini & Paavilainen 2013; Soini & Pirinen 2005; Suominen et al. 2005; Virtanen et al. 2004).

In sum, collaborative design would academically and practically benefit from research on its contribution in dealing with complex systems, particularly as examined within broader context as a relational activity that occurs over the long run. The purpose of my dissertation is to address this research gap by analysing how collaborative design may involve systemic change of a complex system from within a project into wider spheres of application. For this research, Finnish repair construction was chosen as the specific complex system, and the project Living Cycles of People and Buildings (henceforth *IKE* according to the Finnish abbreviation from Ihmisten ja kiinteistöjen elämänsyklit) was chosen as the specific project, in which collaborative design was applied to define development requirements for Finnish repair construction, namely for apartment building renovations. Figure 1.1 illustrates how this study resides in a conjunction whereby *collaborative design* as characterised by empathy, participation, method-making and generative research, and *systemic change* towards resident-oriented housing modernisation in Finnish repair construction are examined in parallel to assess the contribution of design. The core research question is:

> How did collaborative design in the IKE project
> facilitate systemic change of Finnish repair construction
> towards resident-oriented housing modernisation?

FIGURE 1.1
Thematic depiction of the
research gap.

Research gap addressed in the study:
FACILITATING SYSTEMIC CHANGE WITH
COLLABORATIVE DESIGN

COLLABORATIVE
DESIGN

empathy,
participation,
method-making,
generative
research

SYSTEMIC
CHANGE

towards resident-
oriented housing
modernisation in
Finnish repair
construction
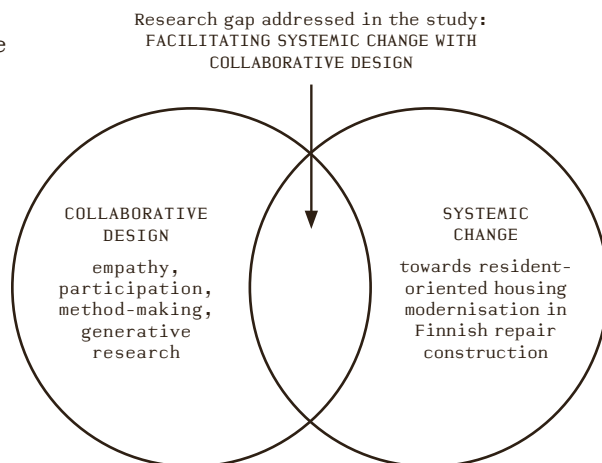
Case study is chosen here as the research strategy in order to get access to the phenomenon in "depth—detail, richness, completeness, and within-case variance" (Flyvbjerg 2011, 314). The empirical research is conducted as a longitudinal case study during a timespan of seven years examining *transformation of Finnish repair construction from technical emphasis towards resident-oriented housing modernisation, and the contribution of collaborative design in it*. The analysis builds connections between activities by different stakeholders in a temporal continuum between 2004 and 2011 that are related to collaborative design conducted in IKE during 2004 and 2005. That is, the case involves following the links between the systemic change, collaborative design, and the ideal vision resident-oriented housing modernisation, which was created in IKE.

In the multi-method analysis of the case, the concept of *systemic change* is applied to examine "transforming the current paradigm into a different one" (Joseph & Reigeluth 2010, 97) vertically in "all levels of the system" (Reigeluth 1994, 3). Instead of an instant alteration from a paradigm to another, it is rather "a continuous process in which we create and design in order to come closer and closer (though never quite attaining) the ultimate goal of an ideal vision" (Carr-Chellman 1998, 373). The concept is adapted and elaborated based on research into the education reform in the USA (Adelman & Taylor 2009; Carr-Chellman 1998; Holzman 1993; Joseph & Reigeluth 2010; Reigeluth 1994; Shen & Ma 2007), and design research on designing for complex systems (Hillgren et al. 2011; Sanders & Stappers 2012; Simon 1996; Thackara 2005; Thorpe & Gamman 2011), and social innovation (Jégou 2010; Manzini 2009; Morelli 2007; Murray et al. 2010). By examining systemic change, this dissertation does not focus on broadening capabilities of designers, but rather on demonstrating the contribution of the approach. The focus is less about the methodical development of collaborative design. It is also important to note that the analysis is mainly focused on activities that relate to facilitating systemic change with design from within a project. This means that the diffusion of innovation beyond the project members to the whole Finnish repair construction is out of the scope of this study.

The main argument in this research is that *facilitating systemic change* is the contribution and position of collaborative design in transformation of Finnish repair construction from technical emphasis towards resident-oriented housing modernisation. Collaborative design prompted reinitation to resident-orientation in the field by 1) producing various occasions for different stakeholders to participate in exploration and envisioning, 2) establishing reciprocal empathic encounters between residents and repair construction professionals, 3) producing experiential material for reflection between everyday and society for various project occasions, and 4) reifying the ideal vision with visualisations and storytelling for later use. Analysis shows that design did not initiate

or implement the change but rather enabled consistent transformation in the field by enabling creation of a shared starting point for change (ideal vision) with strong commitment.

Along these activities in IKE, 67 stakeholders built reciprocal understanding based on residents' experiences in housing renovation projects, and co-created alternative strategies for tackling a growing and complex socio-technical challenge threatening the affluent society in Finland. The resulting ideal vision resident-oriented housing modernisation was adopted as an idea innovation among the project participants. It introduced a novel meaning for renovation as a resident-serving process and an opportunity to improve living conditions through renovations, which was a radical reinterpretation of the previously technically-oriented and professionally-led activity that took borrowed its criteria from new building construction. The new meaning enabled systemic change as it was—according to the participant interviews two and six years after the project was ended, and supplementary documents—adopted by 69 percent of the project participants, and, further, 42 percent of the participants used it as a starting point for fifty follow-up and related developments concerning public and private research, development and solutions concerning individuals, organisations, practices and policies on Finnish repair construction. While specifically illustrating collaborative design in facilitating systemic change of Finnish repair construction towards resident-oriented housing modernisation, the research suggests facilitation as a potential contribution and position of collaborative design in systemic change of complex systems in a more general level to be applied elsewhere too.

The structure of my thesis is the following. The next chapter sets the stage for this study by presenting a literature review on design and change, including consideration about design dealing with systemic change, collaborative design as a facilitation approach, and depicting change with diffusion of innovations. The third chapter presents the empirical research approach that relies on the case study strategy and follows a multi-method analysis of the longitudinal case. The following four chapters present the analysis and findings of this study. In the fourth chapter the premises of systemic change are laid out by presenting how collaborative design immersed into the complex system of Finnish repair construction. The fifth chapter describes the actual project work of IKE that particularly features exploration of the ideal vision for repair construction. The sixth chapter describes the ideal vision (idea innovation) resident-oriented modernisation as a starting point for change with different meanings as interpreted by the project participants with different roles and backgrounds. The seventh chapter presents implementing change at repair construction through reinvention of the innovation resident-oriented modernisation and the motivations behind this. The empirical part ends with three in-depth

accounts as examples of how collaborative design supported commitment to continuous development. I conclude this book with presenting the process of systemic change of Finnish repair construction towards resident-oriented modernisation, and facilitation as the contribution and position of collaborative design in it.

2. Design and Change

The two words—design and change—are fundamentally intertwined, at least for those who agree with Herbert Simon's (1996, 111) classic definition of design as an activity that devises "courses of action aimed at changing existing situations into preferred ones". Many scholars and design thinkers agree with Simon that the purpose of design is to introduce proposals and solutions that would improve, for example, product variety, user satisfaction and an organisation's capability to meet their mission, and that *bring along change* (e.g. Brown 2009; Buchanan 2008; Forty 1992; Friedman 2003; Heskett 1980; Heskett 2005; Krippendorff 1998). Even though some design thinkers criticise the change orientation, for example by asking how much change design can actually propel, whether design outcomes are appropriated, and what are the limits of

change (e.g. Buur & Matthews 2008; Manzini 2010; Mau et al. 2004; Papanek 1984), the common subject of change remains more or less in the core of design.

Along changes in society, also *design itself is changing*. Recent changes within the design profession relates to extending designers' roles and responsibilities from operative roles of product design towards strategic contribution in societal issues (Björgvinsson et al. 2012; Brown 2009; Gamman & Thorpe 2011; Thackara 2005; Valtonen 2007). In these discussions, the design field seems to agree that design holds the basic capability to also deal with more complex, open-ended issues such as ageing of society and climate change. For example, John Thackara (2005, 212) states that people have created the changes that have led us in the current situation by making decisions and actions to implement them, and if some things do not seem worthwhile today, we are able to change them again with design. Design practice, however, needs to find new ways to deal with these more complex issues and focus on deliberation, understanding systems before developing them.

This thesis deals with both of these aspects of design and change: facilitating change with design, and change in design practice in regard to systemic change. The following sections outline a literature review, in which connections of design and change are discussed from the perspectives of the extending role of design towards dealing with systemic change, collaborative design as a facilitation approach in collectively exploring alternative futures, and diffusion of innovations as a way to depict change in a system.

2.1   DESIGN DEALING WITH SYSTEMIC CHANGE

Design is a complicated notion that cannot be definitely defined (Buchanan 2001; Heskett 2005; Krippendorff 1989; Verganti 2008). Probably, one of the main reasons is that design is not a separate entity but part of the societal process embodying many contemporaneous manifestations and interdependencies (Krippendorff 1989). One of the recent manifestations of design is the growing interest in dealing with open-ended and complex issues that involve societal challenges (Burns et al. 2002; Gamman & Thorpe 2011; Hillgren et al. 2011; Jégou 2010; Keinonen et al. 2013; Koskinen et al. 2012; Manzini 2010; Murray et al. 2010; Sangiorgi 2010; Thackara 2005).

I join this discussion by arguing in the thesis for design as an activity that is embedded in society by enabling change in a system. The first step in building my argument is to outline some of the aspects I regard central when examining design as a way to deal with systemic change. In this section, therefore, I present a general review on design as an activity to enable change, and continue with defining systemic change in the context of design, and highlighting the paradox of responsibility in making changes.

As you saw above, Simon (1996) says in his much cited description of design that design is concerned with how things ought to be. Moreover, the fundamental nature of design is said to aim at responding creatively to human and environmental challenges (Mau et al. 2004). Design attitude lives in each project as an opportunity to create something remarkable in a way that has never been done before (Buchanan 2008, 5). Change by design happens through exploring new choices, new ideas, and new strategies (Brown 2009, 3).

          In these ways, design reflects and changes culture (see Forty 1992). Examples of design as a means to enable change have great variance. Designers helped building Finnish identity in the early 20th century and for their part strengthened the endeavours for national independence. The early pioneers of industrial design in Finland in the 1950s enabled this change in Finnish society: design was used by the government and the local press to emphasise national identity and to improve the poor economic situation (Valtonen 2007, 65). Design has been important in Finland also later on, and nowadays the Finnish system of design is tied within the national innovation system aiming to improve the international business competition by increasing the use of industrial design in industry (Kansallinen innovaatiostrategia 2008; Valtonen 2007, 90).

          Design has been important also in other regions. In the UK, a so-called transformation design approach was introduced a decade ago to be applied in some of the British society's biggest social problems such as crime prevention, chronic healthcare, and the school system (Burns et al. 2002). In 2014, design was continued to be applied for a greater purpose to ensure Europe's competitiveness, prosperity and well-being for which the European Commission launched the European Design Innovation Platform. The multinational project is led by the British Design Council to increase awareness of design's role in innovation and growth, and to promote design-driven innovation in industries to strengthen Europe's competitiveness (European Commission 23.9.2013; Thomson & Koskinen 2012).

          In organisations, design involves innovation as a bridging function between R&D, manufacturing, and marketing (Hobday et al. 2011, 6). It is argued that here the contribution of design is in deploying a more holistic approach that appreciates social values and takes different individual perspectives as a source for creativity instead of a disturbance (Hobday et al. 2011; Verganti 2009). Design's position is important in finding the actual framing of ill-defined, wicked problems in the first place (Buchanan 1992; Rittel & Webber 1973). Moreover, "design thinking highlights the social and creative character of business and counters the dominant decision-making view of the firm. [...] Design thinking can lead to a major reorientation [...] thereby moving a view of the firm

as a creative, solutions-generating, social, and flexible organisation"
(Hobday et al. 2012, 28).

These examples illuminate the variety of design's contribution
in enabling change. But what does it involve that design is a means to
enable change? What is design? According to John Heskett (2005, 11—12),
design is not only a profession but a universal skill, shared by all people
similarly to language in that both of them are civilisation's capabilities
to create abstractions. People have *designed* since early men started to
play with materials they found from the nature and transformed natural
materials into forms that had no precedent (Heskett 2005, 9). Simon
states similarly that everyone who devises courses of action to transform
existing conditions into preferred ones, may be called a designer (Simon
1996, 55, 111—114). Design can thus be seen, "as the human capacity to
shape and make our environment in ways without precedent in nature,
to serve our needs and give meaning to our lives" (Heskett 2005, 5).
Nowadays, the capacity of design to shape our world is manifested almost
everywhere around us. If you look around yourself at home, at workplace,
when cycling on a street, going to a supermarket or a cultural happening,
even when walking in forest, you may find that "life is entirely condi-
tioned by design outcomes of one kind or another" (ibid., 5).

Moreover, the word *design* is a multifaceted term that can refer
to "Design is to design a design to produce a design" (ibid., 3). Therefore,
we can talk about, for example, designing (verb), designed artefacts
(noun), purpose of design, and design as a profession (Friedman 2003;
Heskett 2005; Krippendorff 1989; Simon 1996; Valtonen 2007, Verganti
2009). It may also refer to certain practices, subjects, perception, or
appropriations (Krippendorff 1989).

It is difficult to get further with defining design in general
level because definitions are said to be either too limited or too broad
(Buchanan 2001, 7—10). Based on the recent developments on broadening
the scope of design, it is not reasonable to use definitions that are
based on industrial production such as presented by Tomas Maldonado
in 1969 (Verganti 2008) or by Karl Ulrich and Steven Eppinger in 1995
because designers may work for many other purposes. Even the classic
division of design disciplines, separating industrial design, architecture,
graphic design and so forth, is not resistant anymore as design problems
are increasingly wicked and complex, and tackling societal challenges
requires combining several disciplinary viewpoints, and encountering of
multiple and sometimes contradictory stakeholders, agendas and contexts
(Gamman & Thorpe 2011, 3; Thackara 2005).

What design as a means to enable change is about, in the
context of this thesis, mostly involve Klaus Krippendorff's (1989; 2006)
idea on design as making sense of things. He emphasises that design
should focus on sense-making because "[h]umans do not see and act
on the physical qualities of things, but on what they mean to them"

(Krippendorff 2006, 47). Sense-making can be seen as a process during which change towards appropriation of a new solution occurs: "*making sense* always entails a bit of a paradox between the aim of *making* something new and different from what was there before, and the desire to have it make *sense*, to be recognizable and understandable. The former calls for innovation, while the latter calls for the reproduction of historical continuities." (Krippendorff 1989, 9.) The concept of sense-making is applicable beyond physical things to more complex and open-ended design challenges because it does not necessarily focus to the qualities of an outcome but acknowledges the connections between design as creation, as outcomes, and design's role in the larger conversations that drive cultural evolution.

Roberto Verganti (2008; 2009) applies the same definition of design as making sense of things in his idea of design-driven innovation, which promotes design culture in organisations to introduce commercial proposals that would radically change what things mean. His thinking is based on distinguishing two dimensions of design artefacts between a utilitarian dimension concerning aspects such as function and performance, and an affective dimension dealing with meanings, such as symbols, identity and emotions (Verganti 2009, 28). From the point of view of generating radical innovation of meaning (new interpretations of sociocultural meanings instead of innovation of technology), the focus is primarily on the affective dimension to explore alternative designs. Hence, the focus is on more holistic aspects than mere pragmatic and measurable aspects. Design activity focuses on *life* instead of use, on *persons* instead of users, and on *reasons* why people do things in a particular context instead of mere pragmatic needs (ibid., 116, 185).

Richard Buchanan (2001, 13) also emphasises the shift of focus as he calls for exploring "products from the inside—not physically inside, but inside the experience of the human beings that make and use them in situated social and cultural environments". This kind of a more holistic approach in design to sense-making is shared by human centred design approaches such as Patrick Jordan's (2000) designing pleasurable products, Elizabeth Sanders' and Uday Dandavate's (1999) design for experiencing, and Ilpo Koskinen's and Tuuli Mattelmäki's (Koskinen et al. 2003; Mattelmäki et al. 2014) empathic design. These approaches explore people's experiences, meaningful everyday practices and emotions to capitalise them in designing innovative solutions. According to empathic design:

> "First, people give meanings to things and act on
> these meanings, and these meanings both arise and
> are modified in interactions. Second, because design
> comes by its meaning in real life, design research must
> be done in real life. Third, [... a]nalysis of the research

seeks to explicate meanings for design—not to create explanations per se. Fourth, we believe that design researchers need to explore these meanings—and by implication also possible futures—using design-specific means: through the process of making, using visualizations, by making, mock-ups, and storyboards." (Mattelmäki et al. 2014, 68—69.)

In this kind of an approach, meanings are often collaboratively created in a close connection to real life either by bestowing personal meanings or creating them in interaction with other people (Battarbee 2004, 28). Meanings are at the same time personal and shared, and, what is most important for design, meanings can be reconstructed when taken in focus. This way, sense-making is central in design as a means to enable change whether it would concern innovativeness of nations, dealing with open-ended and wicked social problems, or creativity in an organisation.

2.1.2 Outlining systemic change of complex systems

Sense-making comes even more important when the focus of design extends from tangible design artefacts to innovating complex systems. Complex systems are relevant to design, if the object of design is a complex artificial system (such as a city or a housing renovation process), design process is a complex human system (such as haute couture or open innovation), the environment of design is complex (such as markets or social mood), or manufacturing processes are complex (such as supply chains or distributed production) (Johnson 2005, 224; see also Chesbrough 2006; Jégou & Manzini 2008; Lin et al. 2011; Verganti 2009). Complex systems thus may act as the *object* or the *context* of design. Complex systems as the object of design have received growing attention in design literature, primarily, in order to have a broad enough perspective when applying design for systemic challenges that do not have clear, pre-defined boundaries (e.g. Hillgren et al. 2011; Sanders & Stappers 2012; Thackara 2005; Thorpe & Gamman 2011). Discussion on complex systems as the context of design then relates to improving understanding of products and other design artefacts within their larger sociocultural context, especially during the design process and within production networks (e.g. Jégou & Manzini 2008; Lin et al. 2011; Verganti 2009). In this research, complex systems in regard to systemic change involve mainly the former perspective, in which a complex system itself is treated the object of design.

Typically, complex systems as a design object are however not strictly defined in design literature, but discussions and practical design activities are often built around the basic and purposefully loosely framed understanding of complex systems as open-ended and wicked

design problems that are collectively explored (e.g. Keinonen et al. 2013, 17—24; Manzini 2007, 13; Sanders & Stappers 2012, 22—23; Thackara 2005, 1). However, complex systems could be defined, according to Simon (1996, 183—184), as "one made up of a large number of parts that have many interactions". System is a sort of "a law that holds together individual components" in any natural, social or symbolic systems (Jun et al. 2011, 74). A system can be seen a component of a larger system, that is, a complex system comprises of a hierarchical set of subsystems that are also made of their own subsystems, until the lowest possible level of elementary subsystem is reached (Simon 1996, 184—185). When looked this way, complex systems are complicated aggregations of individual components that as a totality are too overwhelming to be understood definitely by an individual person or even a community of people.

Hence, following the previous line of thought, design activities are here aimed at changing a complex system into a preferred one. This process of change requires lots of effort from multiple people concerned to first of all attain a sufficient understanding of a complex system. Additionally, enabling a change in a complex system requires tough decisions on framing the problem, and enlightened reification of the understanding for later use. Implementation of novel systems or diffusion of novel solutions for a system may require long periods of time. (Simon 1996, 139—167.) In my view, also change in a complex system (as an object of design) would be extensive. Social, organisational or technical change have been identified as different dimensions for change by design (Dittrich et al. 2009, 2). As separate aspects they lack scope and scale because change in complex systems would probably entail all of these aspects. Societal change then in the other end would refer to fundamental changes that concern a whole society or even societies, such as industrialisation or climate change, in which design cannot directly affect. Somewhere in between situates systemic change that means a paradigmatic change influencing all parts of a particular system and—what is important for design—systemic change is designable (Carr-Chellman 1998; Holzman 1993; Reigeluth 1994).

Systemic change is defined here as an approach to change that "entails transforming the current paradigm into a different one" (Joseph & Reigeluth 2010, 97) vertically in "all levels of the system" (Reigeluth 1994, 3). Instead of an instant alteration from a paradigm to another, systemic change is rather "a continuous *process* in which we create and design in order to come closer and closer (though never quite attaining) the ultimate goal of an ideal vision of the *whole*, and recognizes the interrelationships and interdependencies between the [...] system and its *community*" (Carr-Chellman 1998, 373; italics by author). This definition is adapted from research into the education reform in USA that has a considerable research body (Adelman & Taylor 2009; Carr-Chellman 1998; Holzman 1993; Joseph & Reigeluth 2010; Reigeluth 1994; Shen & Ma
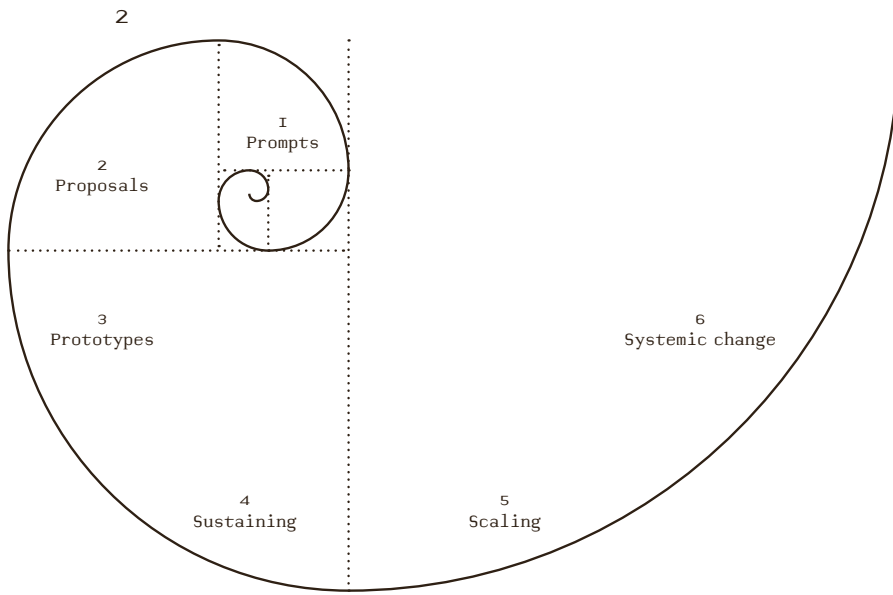
2007) but is somewhat similar to quite loose framings in design literature, primarily in regard to social innovation (Hillgren et al. 2011; Jégou 2010; Manzini 2009; Murray et al. 2010).

The most developed account of systemic change in design literature, that I could find, is given by Robin Murray, Julie Caulier-Grice and Geoff Mulgan (2010, 13) from the Young Foundation as a description of "the ultimate goal of social innovation". According to their thinking, social innovation—an innovation that meets social needs and create new social relationships (ibid., 3)—is a result of a process that takes stages from inception to impact (Fig. 2.1). The first stage, *Prompts*, involves recognising the real problem. The main task is to diagnose the problem and to frame the question in such a way that "the root causes of the problem, not just its symptoms, will be tackled" (Ibid., 12). The attempt to understand the cause, instead of the symptom, is a widely shared thought by scholars and design thinkers (Papanek 1984, 54—85; Rittel & Webber 1973; Sanders & Stappers 2012, 6—8; Simon 1996, 139—143; Thackara 2005, 4—8). If the problem framing is wrong, also the forthcoming solutions cannot solve the actual challenge but may even cause more problems. (Murray et al. 2010, 14—29.)

The stages between two to five aim at attaining the systemic change that is looked for based on the problem framing. In the second stage, *Proposals*, focus is on imagining possible solutions through participation and collective creation, whereas in the third stage, *Prototypes*, the feasibility and attractiveness of ideas are tested through different kinds of real life pilots (ibid., 30—57). Only a minority survive these tests into the fourth stage, *Sustaining*, when solutions are weaved into the everyday

practices through finding feasible models for business, governance, management, finance and communications, as well as a plan for developing supporting operational systems (ibid., 58—81). After finding the purpose, implementation and benefit of the innovation, it is time for diffusion in the fifth stage, *Scaling*. The innovation must find its demand and possibly another, more generally acceptable form in order to grow and spread in the social system. (Ibid., 82—106.)

Finally, according to thinking of Murray, Caulier-Grice and Mulgan (2010, 107), some innovations are so fundamental that they lead to *systemic change*, that is, "changes to concepts and mindsets as well as to economic flows". Systemic change involves many different elements and dimensions that go beyond material manifestations (ibid., 107—123).

> "Systemic change usually involves the interaction of many elements: social movements, business models, laws and regulations, data and infrastructures, and entirely new ways of thinking and doing. Systemic change generally involves new frameworks or architectures made up of many smaller innovations. Social innovations commonly come up against the barriers and hostility of an old order. Pioneers may sidestep these barriers, but the extent to which they can grow will often depend on the creation of new conditions to make the innovations economically viable. These conditions include new technologies, supply chains, institutional forms, skills, and regulatory and fiscal frameworks. Systemic innovation commonly involves changes in the public sector, private sector, grant economy and household sector, usually over long periods of time." (Murray et al. 2010, 13.)

Systemic change is thus quite a fundamental and extensive change process that often relates to dealing with open-ended and wicked challenges such as how to build sustainable infrastructure for green transportation or how to empower adolescent girls in marginalised communities (ibid., 113, 115). Design dealing with systemic change can involve almost any subject matter as design is "universal in scope" and applicable to "any are of human experience" (Buchanan 1992, 16). This general nature has also crucial consequences in regard to systemic change: when only few designers are dedicated to a particular subject field in their professional career and, moreover, design is quite a small profession, design cannot be seen as the significant propulsion for change that would require long-term efforts. Or, the other way round, design as a profession dealing with systemic change should clarify its contribution and role in this kind of an endeavour.

What the education reform adds to design in this context, is knowledge on longer term endeavours from more than a century of development, and qualitative and quantitative assessment of impacts of those endeavours (Adelman & Taylor 2009; Holzman 1993; Shen & Ma 2007). Based on the literature, I have chosen three aspects that offer valuable insights for design: considerations on how to understand systemic, focus on diffusion in processes, and understanding that change is never finished.

One of the main additions to knowledge on systemic change relates to considerations on the variety of aspects *systemic* entails. Firstly, systemic may mean working vertically with all levels of the (complex) system in decentralised behaviour to effect change. Secondly, systemic could be interpreted working horizontally with all the identified units (such as schools in a district) to ensure that change is inclusive. Thirdly, systemic as a systematic approach calls for combining vertical and horizontal aspects in sort of a matrix of change. Fourthly, systemic may refer to the systems approach so that every aspect of the system are considered, eventually after being identified, in the change process. Fifthly, systemic may mean so fundamental changes that the boundaries of the original system have to be rethought. This kind of questioning is also applicable to emerging systems that are still looking their nature. (Holzman 1993.) With understanding of the different considerations, one can choose an approach that would best support dealing change processes of an interested complex system.

The second aspect that research on education reform in the USA calls for, is focus on *diffusion*—the spread of innovation in the system—in processes of systemic change. To ensure that the change actualises in the system, the focus on processes for systemic change should consider, in addition to creation of the vision for systemic cha1nge (designing), also management of implementation (adoption and diffusion) (e.g. Adelman & Taylor 2009; Joseph & Reigeluth 2010; Shen & Ma 2007). As systemic change is "broad in scope and large in scale" (Carr-Chellman 1998, 372), creation of visions is far from attaining systemic change but requires appropriation in the system. A longitudinal perspective also reveals that those innovations that are created in projects tend not to diffuse into the system extensively, if the aim and means of managing change are not purposefully embedded in the process (Adelman & Taylor 2009). This issue has been identified in design too, and one of the solutions has been to establish different sorts of platforms that would enable longer term innovation creation and change processes (e.g. Björgvinsson et al. 2010; European Commission 23.9.2013; Koskinen et al. 2012; Verganti 2009). Time is important but, however, not the only crucial aspect. The problem of not succeeding in appropriation of innovations may still remain even though temporal duration would be longer, if the ownership of the cause and the innovation does not move into the practitioners, and that is why diffusion

needs to embedded in the change processes right from the beginning (Adelman & Taylor 2009, 13—15, 16—18; Shen & Ma 2007, 252—253).

Thirdly, the historical longevity helps to understand that *change is never finished*. On the contrary, once a solution may later become a problem when society, culture, and values change. In American education, the bureaucratic structures were created to ensure desired teaching standards to all students, but nowadays the same structures prevent the school system to offer best possible education. When the world changes, also the system needs to change, and therefore, in its inherent nature, change is never fully achieved but more likely an evolving process that requires constant interpretation of the root causes of problems and negotiation of alternative solutions. (Holzman 1993; Joseph & Reigelth 2010.) This aspect gives support to the interest of sense-making in design as a means to explore proposals that interpret what could make people tick (e.g. Krippendorff 1989; Verganti 2009). Additionally, collaborative design approachers are strong in collective interpretation and creation even though it has not been studied in the context of systemic change before (e.g. Halse et al. 2010; Sanders & Stappers 2012).

2.1.3 The paradox of responsibility in design and systemic change

In the previous sections, I have discussed the extending role of design towards dealing with systemic change, which can be seen as the emerging application of design. When looking from the critical perspective, one may ask what the responsibility of design is in change when generating new futures. The question is particularly valid in regard to such broad in scope and large in scale endeavours such as complex systems and their systemic change. It was already mentioned that design has a limited propulsion to systemic change due to consequences of its universal scope and rather short-termed endeavours. In the following, I will discuss the paradox of responsibility in regard to design dealing with systemic change.

The issue of responsibility of design was originally raised in 1971 by Victor Papanek who outspokenly accused design for being the second most harmful profession in society.

> "In an environment that is screwed up visually, physically and chemically, the best and simplest thing that architects, industrial designers, planners, etc., could do for humanity would be to stop working entirely. In all pollution, designers are implicated at least partially. But in this book I take a more affirmative view: it seems to me that we can go beyond not working at all, and work positively. Design can and must come a way in which young people can participate in changing society." (Papanek 1984, xiii—xiv.)

According to Papanek's thinking, designers should not pollute the planet with unnecessary objects but instead they should focus on working with socially responsible issues that would have a positive impact on everyday people's lives or use a tenth of their working hours (in Finnish kymmenykset) for the greater good. What Papanek himself did was sort of a charity work in the third world, for example, he designed the famous radio from a tin can to offer an affordable solution for anyone interested in radios. Similarly to Papanek's agenda, participatory design was politically active design manifestation that aimed at restructuring the social systems (Kensing & Munk-Madsen 1993; Muller et al. 1993). Participatory designers focused on empowering undervalued workers within the industrial power system in Nordic factories (Ehn & Badham 2002).

The agenda for the greater good lost its sharpest edge during following decades until a call of responsibility rouse again in the beginning of this millennium when several texts were published (CoDesign 2011, issue 3—4; Margolin & Margolin 2002; Mau et al. 2004; Morelli 2007) to discuss the role design might and should take in relation to social and environmental concerns. In this second wave of responsibility, focus does not refer to charity, help, or voluntary work but it is about design's other professional contribution—often referred to as facilitation of participation—that plays a part in bringing well-being and a better livelihood in society (Margolin & Margolin 2002). Moreover, the CoDesign special issue (2011, issue 3—4) on socially responsive design highlights the difference between *responsible* and *being responsive* of social issues. According to Lorraine Gamman and Adam Thorpe (2011, 141) "we are only able to be responsive rather than ultimately responsible in terms of the way we engage with and deliver local social, political and ethical objectives through design". To make responsive making in society possible, designers started to look for an alliance with different actors involving change. Collaboration in design should be seen a vital practice, not another methodological choice, to being responsive and delivering responsible change in the real world.

It is quite realistic to acknowledge that there are limits to have an impact by design, and to try to identify those. In my opinion, however, the paradox of responsibility still remains even though design wishes to position itself to being responsive instead of being ultimately responsible of change. Even though it is difficult to determine who is ultimately responsible of collective actions—if it even is an issue to point out—the question of responsibility cannot however be disregarded but it should, according to Bruce Mau with the Institute without Boundaries (2004, 15—18), be considered who, and how, define the preferred conditions to strive for during change processes. According to Edward Woodhouse and Jason Patton (2004, 7), the foundational questions refer to shortcomings of the contemporary design: firstly, there is a tendency for not to deliberate innovations well enough, secondly, there are significant inequalities in

the share of benefitting from design contribution, and thirdly, there turn out consequences and second-order effects that nobody is foreseeing and pre-empting. To consider these questions, design should be more aware of its accountability in society, not just within its own realm but advancing knowledge on positioning design among other societal functions such as other professions and structures (Woodhouse & Patton 2004, 2—3). Vice versa, understanding the social forces that affect design, such as cultural assumptions, norms, and legal mandates, would bring more awareness to the choices made in designing. Additionally, innovations should be seen as part of the whole, in which they interact and collide with other innovations.

Positioning design as being responsive instead of responsible is in line with the historical development of design practice as an instrumental activity. If we step back in time, it can be seen that design did not use to have that central role in society as it enjoys today. During the seventieth century when early design practice was emerging and scientific research taking shape at universities, design used to be regarded as a servile activity that was practiced by artisans who based their work on practical know-how but were not able to analytically explain their principles in the making (Buchanan 2001, 5). Design was not part of the intellectual activities forming the understanding of how the world functions and how it could be transformed but the task belonged to great thinkers such as Galileo Galilei, Francis Bacon, Isaac Newton and René Descartes who conceptualised their ideas into appreciated theories (ibid., 4—5).

Since those days design has become acknowledged as a more central profession in shaping societies. It has also become apparent that purely theoretical thinking is not sufficient in solving complex problems, but a more holistic approach is needed. Richard Buchanan (2001) claims the two phenomena have interdependency. He continues that *new learning* is needed "to connect and integrate knowledge from many specialisations into productive results for individual and social life" (ibid., 6—7). Integration is needed because traditional science is specialised in particular subject matters but contemporary challenges involve issues that require more holistic considerations. Design can, Buchanan suggests, be a practice that integrates seemingly separate aspects to "conceiving, planning, and making products that serve human beings in the accomplishment of their individual and collective purposes" (ibid., 9).

The paradox of responsibility in design dealing with systemic change is not solved but the discussion above seems to suggest that design can be seen as sort of activity that *helps* dealing with systemic change that cannot be solved from within a single profession or an existing paradigm. What is helping, remains to be explored in the pages if this dissertation.

2.2 COLLABORATIVE DESIGN AS A FACILITATION APPROACH FOR CHANGE

One of the ways to help dealing with systemic change of a complex system is to apply collaborative design as a facilitation approach. Collaborative design is a design approach that involves in design process also others than professional designers such as users and representatives from partner organisations. These design activities typically locate in early front-end of design, even before concept design (Keinonen & Takala 2006). Generation of new futures among multiple stakeholders may involve research-oriented activities such as sharing experiences collaboratively, making sense of the topic, and designing, such as producing potential development directions or more detailed ideas or solutions (Mattelmäki & Sleeswijk Visser 2011, 2). Collaborative design as a practical activity may include a variety of tasks that remind of traditional design activities including for example drawing, conceptualising, making models and other hands on tasks. Additionally an array of new tasks such as workshop facilitation, local activism and boundary crossing activities have become part of the everyday life of these designers and design researchers.

These explorative processes are facilitated by designers who also often participate in the making as one of the contributors. Facilitation then can be defined by using two extremes. The first extreme depicts *facilitation as a skilful activity* that is used to prepare, lead and summarise collaborative events such as focus groups (Chiu 2003). Different conversation assemblies for research purposes that consist of people who share a common background and experiences may be called a focus group (Morgan 1996). The subject of a focus group is usually such that a straight or unambiguous answer will not be achieved, but instead the quality of results is contingent upon the dynamics of the focus group, which makes interaction among participants vital because rather than talking to the facilitator of the meeting, the participants should interact with each other (Chiu 2003).

In the other extreme, *facilitation refers to design events* such as design games (Vaajakallio 2012) but also collaborative design as an approach in which designers are facilitators who more generally enable others to collaborate, be creative and innovate (Thackara 2005). It refers to design as the human capacity to give meaning to our lives (Heskett 2005, 5), which can be fostered with professional designers broadening their attention to people with whom they work. This development relates to two main issues that has been touched upon earlier. Firstly, society is facing new challenges that cannot be solved from within a single profession (Gamman & Thorpe 2011; Mau et al. 2004; Thackara 2005). Secondly, the work culture has changed toward more individual and distributed (Culle et al. 2003; Florida 2002), which has led to a situation where settling down to development needs to be separately organised.

Collaborative design is here an activity to reorganise development in a way that it is not necessarily limited within organisation but can find other assemblages valid for the subject at hand.

Kirsikka Vaajakallio and Tuuli Mattelmäki (2014, 64—65) lay out further reasons for conducting collaborative design, such as for engaging multiple stakeholders, for empowering users, for building design competence, and for research. With these aspects they create a general picture of the activities that were also present in IKE that is the context in this dissertation to study facilitation of systemic change with design. Following their basic depiction, collaborative design will be discussed in the following through its purposes of focusing on empathy for personal understanding, participation for empowerment and ownership, method-making for collective creation and research for generating new futures.

2.2.1 Empathy for personal understanding

Collaborative design is conducted for engaging multiple and diverse stakeholders in "expressing, negotiating and generating a shared understanding of users, use contexts and technology in early concept design" (Vaajakallio & Mattelmäki 2014, 65). This aspect refers to empathy in design as a capacity of participating in the feelings or ideas of another person in a way that the empathic feeling can be applied in design (Fritsch et al. 2007; Koskinen et al. 2003; Mattelmäki et al. 2014). Empathy is, according to Ilpo Koskinen and Katja Battarbee, "an imaginative projection into another person's situation" (Koskinen et al. 2003, 45). It is a personal connection to the end-users but as persons with feelings instead of informants (Mattelmäki & Battarbee 2002).

The importance of understanding the feelings and situations of another is, according to Jane Fulton Suri (2003), a fundamental question because as designers work is to generate things for people that they rarely know, they need to bridge the gap with users in order to create appealing, useful and useable outcomes. The reason behind that designs tend to best serve the needs of people who best resemble the designers stems from a simple logic: 1) designers work is based on their understanding of the world, 2) their ideas are shaped by their individual experiences and background, and 3) they create new meanings based on their assumptions instead of based on the users' assumptions if it has not been the deliberate orientation (Woodhouse & Patton 2004, 2). The challenge, according to Fulton Suri (2003, 52), is to find a balance between the two extremes of *us* designers and *they* users. With this balancing empathic design aims at both accessing the experience of real people, and generating inspiring ideas.

This is the focus in empathic design that is a user-oriented design approach, which has been developed since the 1990s to be able to dive into more ambiguous topics in design than product concept design,

and to have a more explorative approach than in the cognitive models that were used in user-centred design (Mattelmäki et al. 2014, 67—68). It was actually a counter-reaction to usability and other structured and linear modes of iterative design to be more open-minded, curious, and explorative in order to spark innovation through dialogue (Leonard & Rayport 1997; Mattelmäki et al. 2014).

One of the theoretical concepts behind empathic design is user experience that is dynamic, even paradoxical, private, unique, and as such impossible to fully grasp by other people (Battarbee 2004, 25). Over the years, researchers have not found mutual definition for the concept of user experience and even though it is not typically even considered important in the collaborative design literature, it had an impact on the collaborative design approach in the IKE project. Particularly, Katja Battarbee's (2004, 37—52) categorisation of user experience frameworks depicts the understanding of that time that we used in IKE. The first group involves *person centred frameworks*, such as Patrick Jordan's (2000) framework of physio-, socio-, psycho- and ideo-pleasures, that focus primarily on the individual's experience and related elements that might contribute to it. The second group of *product centred frameworks* includes approaches that aim to connect product features to experience and its contexts by for example depicting different perspectives to product relations (Jääskö & Mattelmäki 2003). The third group puts *focus on the action* and includes approaches that focuses on the interaction between people and products in their contexts. Here, a design artefact can be seen, according to Elizabeth Sanders (2001), as the connective node in a network of things that actualise in a spark of the moment between what has happened in the past and what is expected in the future. The fourth framework Battarbee (2004, 79—97) suggests herself by presenting *co-experience* (experiencing together), which presents the social aspect by defining experience as a process that users themselves create together in social interaction.

These aspects helped us design researches in IKE to explore residents' renovation experiences. Empathic design is interpretative in that it capitalises the personal understanding of user experience in generating innovative solutions instead of taking user observations as direct answers or even requirements. The belief behind is that the more designer can connect with user's feelings, the better she can transform her understanding into appealing and pleasing design outcomes (Fulton Suri 2003; Sanders & Dandavate 1999).

Design that is driven by user approaches is however accused for being unable to introduce radical innovations—that in regard to design would not need to stem from a technological aspect but refers to proposing a novel sociocultural model; that is, innovation of meaning represented in product language—because when being immersed in users' world, designers and other present stakeholders are claimed to get stuck

with the prevailing reality and unable imagining radically alternative worlds for the future (Norman & Verganti 2014; Verganti 2008; Verganti 2009). Practitioners of collaborative design are, however, determined that the approach provides a fertile ground for imagining futures that have not been there before by making sense of meanings, and in a way that transforms existing practices (Burns et al. 2002; Halse et al. 2010; Koskinen et al. 2003; Mattelmäki 2006; Redström 2006; Sanders 2001; Sanders & Stappers 2012; Vaajakallio 2012; Westerlund et al. 2003). Therefore sensitivity is needed according to Tuuli Mattelmäki, Kirsikka Vaajakallio and Ilpo Koskinen (2014, 76) toward *humans* (users) and their experiences, and *design* to explore potential design directions instead of getting trapped in the prevailing reality (Norman & Verganti 2014; Verganti 2009). In addition, sensitivity is also needed toward *techniques* to apply generative tools to communicate and explore issues. Recently sensitivity has been also built toward *collaboration*, which has enabled empathic design to broaden its array of topics from products to systems, to organisations and to networks beyond single organisations by tuning the processes and tools according to the confluences of people in a project (Mattelmäki et al. 2014, 72).

2.2.2 Participation for empowerment and ownership

Another design approach that has largely affected the collaborative design approach presented in this dissertation is Participatory Design (PD) according to which the end users—who are "legitimate but resource-weak stakeholders" (Björgvinsson et al. 2012, 105)—are active members in the development of products, environments and services (Kyng & Matthiassen 1997).

PD involves a pragmatic perspective to increase productivity among people who are involved in design activities, a theoretical perspective to use an analytical strategy to overcome the lack of shared understanding between users, designers and other developers, and a political perspective to offer a democratic strategy for people to influence their own circumstances (Greenbaum & Madsen 1993). Jeff Howard (2004) suggests that PD involves three principal themes that delineate this exercise of democracy in design decisions. Firstly, *importance of the local* means that PD activities and techniques are always rooted in a particular place that is comprised of confluences of people, institutions, culture and economics. Even though a PD project would involve a broad network of stakeholders from even different continents, the project would start from the lives of everyday people as a window to the local. (Howard 2004, 42.)

Secondly, *importance of lay empowerment* refers to the original political aspiration of PD (Howard 2004, 42). PD have a long and strong tradition in Scandinavian design community where it has been primarily used in the work contexts with a more or less political emphasis, follow-

ing the work in the Norwegian Iron and Metal Workers Union (Buur & Matthews 2008; Ehn & Badham 2002; Johansson et al. 2002; Kensing et al. 1993; Nygaard & Bergo 1975). In that union, Kristen Nygaard and Olav Bergo introduced a collective process where all members were invited to participate in negotiating over the use of new technologies. According to this original PD project, empowerment to influence their circumstances was gained through learning: all workers who were interested were encouraged to join the project, to learn how the system works, and to influence decisions in the so called collective resource approach (Braa 1996; Kraft & Bansler 1994). Later on empowerment was taken as the focus of design among a selected group of skilled workers, and also used in other than work contexts such as in deprived communities to provide laypeople with the means to envision, prototype, test and refine solutions (Björgvinsson et al. 2010; Braa 1996).

According to Howard, the third principal theme of PD is the importance of organisation, which refers to the organisational context where a PD project is conducted, and that either support or prevent diffusion of new ideas (Howard 2004, 42—43). The theme, more likely in the context of this dissertation is *importance of ownership*, involves all participatory action. In the end, to achieve a self-sustaining process that would change a participating organisation (that could also be a collective), it would require that, in addition to users becoming empowered in affecting their situation as described above, organisation's communication and politics would also support diffusion of ownership. That is, a wide range of actors should become aware of the PD achievements to realise the initiative and share possible gains. (Clement & Van den Basselaar 1993, 35—36.)

Lately there has been different strategies to overcome this challenge of appropriating design outcomes and making a change. Jacob Buur and Ben Matthews (2008) suggest focusing in an innovation perspective that would add a design anthropology approach and market orientation to PD. Their suggestion is based on the observation that a lack of ownership among decision-makers in a company, such as members in a business unit, may lead to disregarding PD project's core observations and concepts that appeal users. Authors continue that the market orientation opens the question of management of design projects in the partner firm in a way that would help to overcome resistance of user involvement, respectful involvement of expertise and diffusion of user-developed innovations—for example through business modelling (Buur & Matthews 2008, 271; Buur et al. 2013).

Another perspective is provided by Erling Björgvinsson, Pelle Ehn and Per-Anders Hillgren (2012), who suggest that designer's role should be elaborated in supporting future appropriation of design outcomes—such as services, systems, and environments—to support radical change for more sustainable lifestyles and consumption habits. The key in

this approach is in "infrastructuring" that involves "envisioning emerging landscapes of design through which social and material transformations take place, landscapes shapes by the opening up of questions and possibilities" (ibid., 109). Project work should be seen then as a platform for creating starting points that different stakeholders can appropriate and enact. The connective factor in these suggestions is that PD has moved from a working mode in which the design team is working *for* the client to a mode in which the design team works *with* the client (Halse et al. 2010, 71). The working modes have different consequences: the first leads to a situation where the deliverables drive the process while in the second the series of common co-design events tie the process together during which mutual learning guides the formation of and leads to ownership of outcomes (Binder et al. 1998; Brandt 2001).

2.2.3 Method-making for collective creation

The approaches of empathic design and PD have become closer to each other over the years when both have broadened their topics towards more complicated services, systems, environments, and considerations beyond single organisations. That is, even though the political aspect of empowering continues to be an important issue when trying to understand the connections between design and society (Woodhouse & Patton 2004), nowadays PD as an approach is widely used in the Scandinavia, Italy, UK and USA as a more general emphasis on collective making and shared ownership among many different stakeholders (Burns et al. 2002; Heikkinen et al. 2012; Manzini 2010; Rizzo 2010; Sanders & Stappers 2012; Thackara 2005; Vaajakallio 2012). Also the aspect of empathy has been widely adopted as a means to create rapport among different stakeholders on the basis of immersion to the user's lifeworld when dealing with complex systems (Björgvinsson et al. 2012, 101; Postma et al. 2012; Sleeswijk Visser 2009; Steen 2013, 23; Thomson & Koskinen 2012, 63).

In line, both design approaches have invested heavily on methodical development, namely so called innovative methods that promote creativity and participation instead of traditional methods such as market research, focus groups, questionnaires and interviews, or adapted methods such as observation techniques, ethnographic methods and usability testing methods from human-computer interaction that are developed for tracing and evaluating chosen research subjects (Hanington 2003, 13). Innovative methods instead are, according to Bruce Hanington (2003, 15) "identified by their participatory nature, creative engagement and outcome, and their relatively specific application to design research".

Turkka Keinonen (2009) elaborates Hanington's ideas further by stating that innovative design methods could be described according to their purpose of either being agenda, competence or instrument. He exemplifies his categorisation with the description of the probes method

that is a user study method, in which people are given tools to reflect on, express and document their thoughts and views on the environments, values and events (Mattelmäki 2006). The original cultural probes, presented by William Gaver, Tony Dunne and Elena Pacenti (1999; Gaver et al. 2004), can be seen as an *agenda* that manifested its criticism toward systematic user-centred design by applying ideas of the artist-provoca-teurs called Situationists in collecting inspirational material for design. Inspired by the cultural probes, Tuuli Mattelmäki (2006) developed the design probes, or empathy probes, that can be seen then through *competence* to build rapport with users in a sensitive manner. Finally, mobile probes as another interpretation of the probes method (Hulkko et al. 2004), is more likely an *instrument* that streamlined a user-centred project process.

Probes and most other innovative methods are projective in their nature in that they are used for uncovering people's needs and desires that cannot be traced or observed. Elizabeth Sanders describes different ways to access people's experiences in terms of three levels: what people say, do, and make. *Say* refers to explicit issues that can be discussed, *do* refers to observable ways of using and acting, and *make* refers to tacit and latent feelings and dreams that cannot be directly explicated but need convivial tools to be explored (Sanders & Dandavate 1999). Later on she has refined her definition by grouping different methods for enabling collective creation—a mindset and moment of creation among various stakeholders (Mattelmäki & Sleeswijk Visser 2011, 7)—to *making*, *telling*, and *enacting* composing sets of generative toolboxes that can be used in iterative cycles in different design phases (Sanders & Stappers 2012; Sanders & Stappers 2014).

Many of the generative tools are being used in workshops, which are probably the most common method to organise collaborative design. Workshops are events for making: sharing perspectives, forming visions and creating new solutions face-to-face within a temporary space (Halse et al. 2010). Workshops fit especially well in projects that involve diverse stakeholders, such as users and companies, in which occasions to share perspectives and to adjust the aims grow important (Buur & Soendergaard 2000). Moreover, workshops are often exploratory and concrete at the same time because the working mode substantially rests upon open-ended exploration around a particular theme but aims at producing tangible outputs. (Halse et al. 2010.)

Probes, workshops and other innovative and generative methods are also a strategy to explore people's sociocultural worlds and as such to respond to their needs and aspirations through collective creation. This spirit of collaborative design has been manifested in developing tools and methods to secure the quality of work in collective processes and to teach design skills (Lee 2013). Method development is however rather open-ended and contextual; methods are actually in regard to collabo-

rative design often created or at least adjusted according to the topic at hand, and therefore there are countless versions of many methods. Jung-Joo Lee emphasises this aspect by stating that methods should be treated according to contextual requirements and not just to take them out from a toolbox to slavishly repeat the recipe of the method (Lee 2012). She (2013) further suggests that method-making is actually a method of designing itself to explore users and solution spaces. In that, method-making can be understood as "articulated introspection into what the designer already knows, through iterative externalizations of what the designer wants to know in relationship to an instrumental goal" (ibid., 8).

2.2.4   Generative research for new futures

The interest towards methods relates to collaborative design, and also empathic design and PD, in applying research for generating new futures. Roberto Verganti's (2009) idea on research in regard to design-driven innovation suggest that research in design is "exploring new possibilities, recombining others' findings, experimenting, identifying promising results, sharing them with others, exploiting their discoveries" (ibid., 115). Moreover, "Research in the early phases of a design project often is referred to as generative, formative, or discovery research, and generally is contrasted to evaluative research, typically positioned as an end-stage component of research" (Hanington 2003, 12). Knowledge gained from research is then the basis for envisioning. Therefore, the final aim is not only to produce knowledge but to integrate and recombine emerging knowledge in society to produce novel interpretations on meanings for design. Research has thus a purpose of deep immersion to comprehend subtle and tacit sociocultural models, and to introduce proposals for new meanings that challenge the existing equilibrium in society. (Verganti 2009, 132—134.)

In this view, research cannot be separated from design but it should be seen within design because design and learning are interrelated elements in the design practice (Buchanan 2001; Schön 1983). Today, research have become so important aspect in design that it is applied for theoretical and practical purposes, and even design students learn design skills to tackle more abstract challenges than product design through research (Breslin & Buchanan 2008; Keinonen & Koskinen 2007). There are however different aspects to design research. Particularity of learning can be depicted with the help of Richard Buchanan's (2001, 17—19) definition of types of design research, following the classical definition of research as being basic, applied and clinical research that respectively have different purposes. Basic research produces fundamental knowledge on the phenomena such as presented by Buchanan (1992) in regard to design on wicked problems, applied research focuses on discovering principles such as presented by Ilpo

Koskinen and others (2012) on constructive design research, and clinical research then aims at exploring particular questions, for example, to find requirements of developing Finnish repair construction as is presented in this dissertation.

In regard to the research question of this dissertation on how does design facilitate systemic change from within a project, the focus is here in clinical research that is a practical activity within collaborative design that draws parallels, in addition to design-driven innovation, at least by constructive design research and generative research. Constructive design research is a conceptualisation of contemporary design research activities that share the aim to integrate design and research, and therefore not only to produce conceptual thoughts written on a paper (Koskinen et al. 2012, 6). In constructive design research, planning and doing, reason, and action are combined (ibid., 2). It "refers to design research in which construction—be it product, system, space, or media—takes center place and becomes the key means in constructing knowledge" either in lab environment, at field or as presented in showroom (ibid., 5, 51—107).

Generative research then, as a more particular user-oriented collaborative design approach, is said to "inform and inspire the design and development process" (Sanders & Stappers 2012, 18). It helps organisations to find key issues by bringing people in design processes to express their ideas and dreams in a participatory manner (Sanders 2005; Sanders & Stappers 2012, 8). To support it, generative research often blends informational and inspirational approaches. Informational approaches are typically conducted by trained researchers with scientific approach whereas inspirational approaches usually concern designers with experimental, ambiguous and surprising means emphasising future and unknown aspects. Design research in this practical clinical form represented by constructive and generative design research resembles design's general definition of transforming existing situations in to preferred ones by making sense (Krippendorff 1989; Simon 1996), in addition to the societal function of building new knowledge. Design therefore approaches research, and research becomes a means for design.

Research within design goes back to a basic notion in design called design thinking—divergent exploration of futures that would be desirable, viable and feasible—that promotes itself as an applicable approach in different contexts and fields, also beyond traditional design tasks including activism and politics (Brown 2009). That is, design is more likely opening new possibilities than narrowing down options. Design is free to move between subjects and combine aspect, and "[t]he subject matter of design is potentially universal in scope, because design thinking may be applied to any area of human experience" (Buchanan 1992, 16). The ground where this universal scope of design stems from is that design has no special predefined subject matter for the profession but it typically

involves challenges that are 'indeterminate' and 'wicked' (Rittel & Webber 1973). Design then—especially in the front-end—is focused in discovering a particular subject out of issues in specific (project) circumstances (ibid.), in which research as a sort of immersion in a topic has become central in generating new futures.

2.3 DEPICTING CHANGE WITH DIFFUSION OF INNOVATIONS

The literature this far has been setting a stage where design has been presented as an activity to deal with systemic change of complex systems. This activity was positioned as a continuation of design profession's history to enable change through sense-making, but with a disclaimer that design has its limitation in propulsion of systemic change. In this picture, collaborative design was presented as a facilitation approach for change. This particular design approach was handled as a continuation of empathic and participatory design tradition that focuses on facilitating creation of new meanings among people and organisations with particular methodical focus. The third part of the literature outlines diffusion of innovations as a way of depicting systemic change.

     According to sociologist Everett Rogers' (2003, 5) classic definition, "*Diffusion* is the process in which an innovation is communicated through certain channels over time among the members of a social system". Further, it is "a kind of social change, defined as the process by which alteration occurs in the structure and function of the social system. When new ideas are invented, diffused, and adopted or rejected, leading to certain consequences, social change occurs." (Ibid., 6.) Adoption then is an individual decision (micro) while diffusion is a social process (macro) (Goldsmith & Foxall 2003, 321). Rogers describes diffusion as a process that comprises of four main elements: an innovation, communication channels, time, and a social system. During the process that proceeds in time, an innovation is spread among members of a social system through communication channels (Rogers 2003, 11). In diffusion networks, well-networked opinion leaders and change agents work together to achieve a critical mass, "the point after which further diffusion becomes self-sustaining" (ibid., 344).

     Diffusion of innovations shares similarities with systemic change in that it also involves a change process (diffusion) based on the ideal vision of a whole (innovation) among a community of people (adopters). Diffusion of innovations may also have several consequences in different vertical and horizontal levels of the systemic structure that manifest the change. The difference, when simplified, is that the diffusion of innovations theory is an explanatory tool for reasons of diffusion, whereas systemic change theory more likely compose a descriptive account for implementing change. The former also typically involves technically oriented innovations, while the latter has a focus on social innovations,

even though the theories overlap by both fundamentally understanding the world as a socio-technical construction. (Carr-Chellman 1998; Joseph & Reigeluth 2010; Murray et al. 2010; Reigeluth 1994; Rogers 2003.)

Diffusion of innovations has also a long history of research like research on systemic change of education reform. Rogers (2003, xv, 39) introduced the diffusion of innovations theory in the beginning of the 1960s. He was puzzled why some farmers delayed their adoption for several years, even though the innovation seemed to help in their work. Based on his extensive analysis, he developed a general model for diffusion. The model applied ideas, for example, of Gabriel Tarde's laws of imitation (invention and imitation are fundamentally social acts) as the basis for adoption, and ideas of Georg Simmel's stranger (a member of a system but not strongly attached to it) as the basis for a conceptual tool to study how innovations diffuse in a system (ibid., 41—42).

The diffusion of innovations is an exceptionally successful theory that has been widely applied for almost half a century. One of the most well-known aspects of the theory is the innovativeness of members of a social system from the perspective of earliness of adoption. The theory does not restrict to identifying ideal types of adopters between laggards and innovators (ibid., 282—297), but other applications include, for example, the adopters and change agents role in the diffusion process, the rate of adoption, the tools for diffusion, and consequences of innovation. (Ibid., 94—100.) Despite the criticism on, for example, pro-innovation bias, focusing on individuals instead of systemic factors for change, or inattentiveness to equal distribution of benefits (ibid., 105—135), the theory has lent itself to many fields, including design (e.g. Murray et al. 2010; Verganti & Öberg 2013).

Even though diffusion of innovations have not always been explicitly applied in design, the basic idea of diffusion has been used to highlight the importance of impacts and appropriation (Jégou & Manzini 2008; Lin et al. 2011; Manzini 2007; 2010; Murray et al. 2010; Nygaard & Bergo 1975). These applications are often related to understanding that if design ought to enable change, some sort of diffusion of ideas needs to occur, and design should reach its considerations that far. This probably relates also to interest in designing for complex systems that are not directly manufacturable and sellable but need other paths of appropriation.

In this dissertation, I apply diffusion of innovations as a framework to shift the analytical perspective from generating innovations to assessing the impact. My personal interpretation from the perspective of collaborative design approach is that the design process itself can be seen part of the diffusion process, during which design outcomes and the approach itself are created and also, at their best, adopted. That is, as diffusion requires social learning that involves ideological considerations and often pluralistic debates that reveal social values and limitations

(Woodhouse & Patton 2004, 8), sense-making (Krippendorff 1989) during a design process may spark diffusion. Following this line of thought, the diffusion of innovations theory is a prospective means to build link between innovation creation and diffusion in this research. One of the strengths of the theory is that it offers analytical tools to depict individual and organisational decision-processes that lead to innovation adoption that when spreading, leads to change in a system through diffusion of innovation. In the following, some main aspects of diffusion of innovations in regard to depicting systemic change are discussed.

2.3.1   Intensity of innovations

The main element of diffusion is the innovation that, according to Rogers (2003, 12—13), is an idea, a practice or an object that are broadly speaking new technologies that compile of hardware and software. While many innovations have both aspects, the material and immaterial form, there are also so called idea-only innovations concerning, for example, philosophy, religion or policies. Also science and art introduce innovations that renew themselves and society through varying media (Sternberg et al. 2003).

Hence, almost anything can be innovated. From design perspective, objects of innovations could be products, services, processes, organisations, sociocultural systems, ecosystems and so forth (Norman & Verganti 2014, 82). When innovations concern novel meanings instead of technical novelty, the objects and forms of innovation are practically endless. Based on this idea, social innovations—focusing on generating innovations that are good for society and enhance society's capacity to act—have recently raised lot of interest among designers (Dervojeda et al. 2014; Hillgren et al. 2011; Morelli 2007; Murray et al. 2010).

The object or form of an innovation is not crucial when assessing the quality of innovation but the determining factor instead is the newness that is perceivable and changes depending of the context and user (Rogers 2003, 12). An innovation may be totally new, a combination of earlier solutions or sometimes the idea for innovation is a copied from another field where it may have been established earlier on but have remained unknown for another field (Sternberg et al. 2003).

The most typical depiction of an innovation relates to its intensity as described according to two ends, radical and incremental innovations. Improvement of current solution is regarded as *incremental or continuous innovation. Radical or disruptive innovation* is changing the frame by being dissimilar and unique compared to previous inventions. More practically it could be said that incremental innovation is doing better what we already do, and radical innovation is doing something else we are used to do. (Dewar & Dutton 1986; Norman & Verganti 2014.) Radical and incremental innovations are typically associated and alternate in periods: radical innovations introduce transformative breakthroughs

that need to be supported with incremental innovations to make the disruptive idea down-to-earth and help diffusion. The other way round, incremental innovations eventually wear down the perceived newness, and radical innovations are needed to renew businesses. (Verganti 2009, 47.)

From the point of view of designing for complex systems, Sternberg et al. (2003) present an interesting model for understanding innovations based on their creative contribution. In this *propulsion model of creative contribution*, innovations are differentiated according to their type of creativity. The first three types of creative contribution represent changes in practices that are fairly predictable and easy to appropriate. *Replication* represents a contribution of duplicating or improving an existing innovation, for example, by lowering the price or improving the quality of a product without intervening the existing field. *Redefinition* means a contribution of providing a new perspective for a field by, for example, introducing an existing product to a new audience whereas *forward incrementation* introduces the next evolution of an existing innovation. (Ibid., 160—162.)

The following three types describe instead innovations that are difficult for people to grasp and may require change in conditions before they are adopted. *Advance forward incrementation* exceeds the expected evolvement in a field by introducing an innovation that takes a considerable step in comparison to earlier solutions. *Redirection* changes the course of direction in a field by introducing an innovation that is different in kind from the earlier solutions. (Ibid., 162—165.) *Reinitiation* presents a wholly new innovation, often boldly and daringly, and provides a new starting point for a field to move about (ibid., 165—167).

The last two types of creative contribution represent contributions that require capability of combining seemingly differing aspects. *Reconstruction/redirection* represents a return (temporally) back to an earlier solution but by reinterpreting it and giving a new course of direction for a field at the same time (ibid., 165). The contribution of *integration* is to put dialectically together two or more ideas from domains of inventions that were used to be viewed distinct or even opposed, and to introduce a new synthesis that may combine ideas or even fields (ibid., 167—168).

Any of the types of creative contribution do not circumscribe the object or driver of innovation—whether it would be market-pull i.e. user-driven, technology push, or design-driven innovation (Verganti 2009, 55)—but can be applied into assessing any form of innovation. Neither do the suggested eight types evaluate the amount of creativity—their incremental or radical nature—but help to understand innovations as different kinds of creativity channeling that move a field forward, or in other words, change a field. The types more likely elaborate the dualistic notion of defining the intensity of innovation either incremental or radical from the point of view of creativity, which helps building more robust

understanding on the relation of generation and implementation of innovation. According to the propulsion model of creative contribution, these eight types of creative contributions have different ways to propel a field forward. It shows that creative contribution may generate movement within or beyond the existing practices in a field. Certain types require more comprehensive changes while others are incremental improvements that are easier to accept. As such, the model offers an account for understanding systemic change of complex systems in regard to why certain types of innovations are more readily acceptable than others.

2.3.2 Adoption through innovation-decision process

The newness, or the creative contribution, is the fundamental factor for an idea, a practice, or an object to be considered as an innovation. The newness also brings forth certain uncertainty of the innovation and its impacts, which needs to be dealt—individually, collectively or in organisations—in order to successfully adopt an innovation (Rogers 2003, 168). Rejection means that the innovation is ignored or discarded because, for example, the adopter did not associate oneself enough with the innovation to change her behaviour. Adoption means an overt behaviour change where old patterns are replaced with new ones.

Adoption and rejection is identified to actualise in a cumulative sequence of stages, which Rogers calls *the innovation-decision process* (ibid., 198). The qualitative analysis of this process helps to understand, as depicted in figure 2.2, how the adopter "passes from gaining initial knowledge of an innovation, to forming an attitude toward the innovation, to making a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision" (ibid., 168). The first three stages in the innovation-decision process involve a mental process of thinking and deciding. In the first *knowledge* stage, the adopter is exposed to an innovation and gains an understanding of the principles of how it works (ibid., 171—174). If this exposure is preceded by favourable prior conditions, such as having experienced needs or problems, and customary practices and general norms in the person's social system fit the innovation, awareness of the innovation may turn into perceiving it interesting and relevant. In the second stage, *persuasion*, a person forms a favourable or an unfavourable attitude toward the innovation (ibid., 174—177). Persuasion deals more with an affective aspect during which the person becomes more psychologically involved with the innovation than cognitive issues, as was the case in the first stage. The third stage of *decision* is the turning point where the person makes a choice whether she adopts or rejects the innovation (ibid., 177—179). In this stage, the newness and the uncertainty it entails are best dealt by trying out the innovation in order to make a decision. In this way, the adopter can try out whether the innovation brings relative advantage—economic, status,

PRIOR CONDITIONS
I. Previous practice
2. Felt needs/problems
3. Innovativeness
4. Norms of the social
   systems

COMMUNICATION CHANNELS

| I. Knowledge | 2. Persuasion | 3. Decision | 4. Implementation | 5. Confirmation |

I. Adoption ———→ Continued adoption

Later adoption

Discontinuance

2. Rejection ·····→ Continued rejection

CHARACTERISTICS
OF THE DECISION-
MAKING UNIT

I. Socioeconomic
   characteristics

2. Personality
   variables

3. Communication
   behaviour

PERCEIVED
CHARACTERISTICS OF
THE INNOVATION

I. Relative advantage

2. Compatibility

3. Complexity

4. Trialability

5. Observability

FIGURE 2.2
The five stages model of innovation-decision
process by Rogers (2003, I70).

preventive or incentive benefits—and compatibility with values, beliefs, needs and previous ideas so that the adopter choices the innovation over other options (ibid., 229—257).

The last two stages in the innovation-decision process moves from a mental exercise to involving action and changing behaviour. In the fourth stage, *implementation*, the adopter puts the innovation to use and therefore faces an overt behaviour change (ibid., 179—180). In addition to using the innovation, it can also be re-invented, that is, changed or modified to fit the adopter's needs and values (ibid., 180—188). Innovation diffusion scholars used to think that re-invention is a sign of a weak innovation because then the innovation have not been good enough and "ready" (ibid., 184). Similarly design used to aim at finalised products that ought to stand alone as complete solutions because users' alterations in designed artefacts were often seen as a menace to quality. In practice, users often co-construct innovations to fit their situations, a growing phenomenon that is often supported with design today (Binder et al. 2008; Rogers 2003, 188). To give an example in design of assistive products, it is suggested that personalisation is not valuable only for gaining ergonomic individuality but also should be seen as a means for expressing the self (Jacobson 2014). From the diffusion of innovation perspective, re-invention gives adopters more choices than just adoption or rejection, allows customising the innovation to fit particular contexts, and leads to greater commitment and sustainability (Rogers 2003, 185—186). Moreover, re-invention is valuable when designing complex systems,

because it helps adopters to build personal relation with the innovation (ibid., 187, 257). If design is dealing with complex systems, one of the design tasks is seen to generate starting points for later use, for ongoing design (in use) and future appropriation (Björgvinsson et al. 2012, 115), in which re-invention can be even encouraged with the form of the innovation that allows alteration. *Confirmation* as the last stage of the innovation-decision process completes the process during which the innovation loses its separate identity as it has been fully routinised into ongoing practices (Rogers 2003, 189—192). However, the process actually never ends because in any stage the adoption may be discontinued because of dissonance, that is, the innovation is not seen valuable anymore or simply due to changes in conditions.

Innovation-decision also may happen in broader contexts than as an individual process, in which adopters make *optional innovation-decisions* rather independently from a social system. Individuals have also freedom to discontinue their decision in any stage of adoption, if the innovation is not perceived valuable anymore. However, once a group of members in a social system make *collective innovation-decisions* through reaching a consensus—such as voting for a new system—the individual members of the system ought to follow the decision to sustain the system even though they would disagree later on. The difference between individual and organisational innovation-decision processes is that individuals make their own decisions but in organisations there may occur in addition to individual and collective innovation-decisions also the third type of *authority-driven decisions* that are driven by few individuals holding a high positions of power or other status. (Ibid., 403)

The innovation process in organisations focuses on implementation of innovation, as is illustrated in figure 2.3. The first two stages in organisation's innovation process involve initiation to the innovation by gathering information, conceptualising and planning how to adopt the innovation within organisation. The innovation process is launched in an organisation after it has defined some organisational problem that creates a perceived need for innovation. This first stage of *agenda-setting* can additionally be launched because of identifying an innovation that is perceived valuable for the organisation (ibid., 422—423). The second stage, *matching*, involves trying to find fit between the innovation and the organisation, and ends with the decision to adopt the innovation and to start implementation activities (ibid., 423—424).

The following stages involve various events, actions and decisions that are directed to diffuse the innovation in the whole organisation step by step. The difficulty of the third stage *redefining/ restructuring* depends on the intensity of the innovation: the more radical innovation, the more re-invention is needed to modify the innovation and also the more accommodation is needed in organisation, for example, by establishing a new unit to fit the organisation and the

DECISION

I.INITIATION: information gathering, conceptualising, planning		II. IMPLEMENTATION: events, actions, decisions		
I. AGENDA- SETTING	2. MATCHING	3. REDEFINING/ RESTRUCTURING	4. CLARIFYING	5. ROUTINISING
General organisa- tional problems that may create a perceived need for innovation	Fitting a problem from the organisa- tions' agenda with an innovation	The innovation is modified and re-invented to fit the organisation, and organisational structures are altered	The relationship between the organisation and the innovation is defined more clearly	The innovation becomes an ongoing element in the organisation's activities, and loses its separate identity

FIGURE 2.3
Five stages in the innovation process in
organisations by Rogers (2003, 421).

innovation together (ibid., 424—427). The fourth stage, *clarifying*, the
process continues by making the meaning of the innovation more clear
through social interaction among organisation members (ibid., 427—428).
In the meanwhile, the innovation is being spread in various units to
cover the organisation. The last stage of *routinising* ends the process
from where on the innovation, similarly to individual innovation-decision
process, looses its separate identity and is seen as integral part of the
organisation (ibid., 428—430).

When looking at the innovation-decision process and the
innovation process in organisations in relation to diffusion of inno-
vation—spread of an innovation in a system—these aforementioned
processes are only a part of the entire diffusion. What these processes
show is the steps that lead to adoption or rejection of an innovation.
Innovation-decision processes are thus central in building the body of dif-
fusion: each individual who goes through the process—whether through
optional, collective or authority-driven innovation decisions—and decides
to adopt the innovation, increase diffusion.

2.3.3 Change and the question of commitment

What makes diffusion of innovations challenging, is that people are
more likely to continue with similar courses of actions than changing
one. Especially in organisations, "the difficulty is that once decided,
courses of action become difficult to reverse" (Pfeffer 1981, 290). As
"commitment involves the binding of an individual to a decision, so that
consistent beliefs develop and similar decisions are taken in the future"
(ibid.), a committed person or community tends to sustain behaviour
according to their commitment. Commitment is often seen as this kind
of irreversible loyalty to the prevailing practice but it has similarly an
important role in systemic change. Persistence based on this kind of
enduring and empowering commitment to "the ideal vision of the whole"

(Carr-Chellman 1998, 373) is equally needed when one pursues systemic change (Adelman & Taylor 2009; Joseph & Reigeluth 2010).

The tendency to resist change cannot be ignored though. Business theorist Jeffrey Pfeffer' (1981) illuminates commitment as an effect that builds organisational stability. Organisations are pluralistic, and their members and activities are divided into various interests, subunits, and subcultures (ibid., 28). According to Pfeffer, commitment enables organisations to pursue for collective actions but commitment may also cause organisations to persist in courses of action even though they are not useful anymore (ibid., 289, 327). There are three conditions for commitment in organisations. The first condition for commitment in organisation is about whether its individual members perceive they are free to choose their engagements, that is, *volatile choosing* from among a set of options engages people and increases their commitment. Secondly, as long as commitment is private it is more easy to alter whereas commitment increases, if one exposes her commitment to public actions in the organisation or even get *publicity* to her engagements. Thirdly, commitment occurs if these publicly chosen actions are also *irrevocable*, that is, behaviour cannot be reversed due to formal agreements or unfavourable consequences. (Ibid., 291-292.)

Even though Pfeffer's conditions for commitment do not directly deal with complex systems as such but worker and organisational performance (cf. Pfeffer & Salancik 1978; Pfeffer 1998), the conditions of commitment help to understand the powers that effect change. Pfeffer suggests that commitment deals with institutionalisation of power in organisations, and organisations' reactions to uncertainty and change. For systemic change of complex systems it would mean that each organisation that needs to alter their courses of action, has to go through certain internal processes and adapt to changes in the environment (Pfeffer 1981, 329—332). The change processes are difficult, and often new stakeholders are needed outside the customary set-up to boost change because "change in organizations is largely externally induced" (ibid., 331).

According to the diffusion of innovations theory, change agents (helping in the innovation-decision process) and opinion leaders (affecting attitudes) have an important role in encouraging individual and organisational adopters to make the decision to adopt an innovation (Rogers 2003, 300—364). Especially, if they are dedicated professionals for change—their assignment is to promote change instead of doing that as a secondary task—they can introduce a variety of ways to break prior commitments and create new ones with the innovation by showing the relative advantage and compatibility of the innovation to the adopters (ibid., 229—257). This is also the role of design when it makes proposals for alternative futures. However, current devotees to systemic change in design have a different approach. Instead of trying to work for change from within organisations, like traditional change agents typically do,

they initiate open and collaborative platforms that invite everyday people and professional stakeholders to explore change with creative ways (e.g. Björgvinsson et al. 2010; European Commission 23.9.2013; Koskinen et al. 2012; Verganti 2009).

Despite the approach to promote change, there are many relational factors that affect how innovation is diffused, and whether commitment is channelled to sustaining the existing paradigm or advancing a new one. Prior conditions and adopter's individual characteristics such as socioeconomic aspects, personality and the interconnectedness of the persons communication affect how readily the individual is responding to an optional innovation (Rogers 2003, 170). These individual factors are said to have more importance during innovation generation, whereas during implementation and diffusion, relational and organisational aspects count more (Magadley & Birdi 2012). Organisations that hold lot of knowledge and expertise, are interconnected within the social system in and beyond the organisation, have slack resources for experimentation, and have leaders with an attitude toward change, are more ready to adopt new ideas. These organisations are typically large and operate in a field that is characterised by system openness. Instead, organisations that are centralised and formalised tend to resist diffusion of innovations. (Rogers 2003, 411—414).

Innovativeness can also be a commitment. Design management theorist Roberto Verganti (2009) presents North Italian design firms as an example of organisations committed to continuous change. They build design discourse as a continuous exploration to seek for radical innovations. The design discourse involves a large network of actors comprising of interpreters who detect new possibilities and propose new meanings and product languages, including designers, pioneering projects, research institutions, and lead-users, and interpreters who explore new meanings to things such artists, cultural organisations, sociologists and other humanities, marketers and media (ibid., 117, 120, 125). Here the whole community, including the company and the network around it, is built upon making a change with designed products.

In her research, sociologist Rosabeth Kanter (1972) illuminates the meanings of a community (not an official organisation) in regard to commitment. She studied nineteenth century utopian communities that were able to create sustainable communes that survived crisis, persecution, debt and internal dissension (ibid., 75). These successful deeply religious communities shared a similar social *commitment-building process* with six mechanisms. *Sacrifice* relates to giving up something—in religious communities it was often abstinence from intoxicants, certain food and sex—to show the willingness to belong to the community as sort of a price of membership (ibid., 76—80). *Investment* refers to committing one's profit—economic, time or energy resources—for the community, because it makes commitment irreversible as leaving would

be costly (ibid., 80—82). *Renunciation* of certain relationships encourages loyalty and allegiance to the community as other attachments with the outside world are avoided, which distinctive styles of clothing, language and so on support (ibid., 82—91). *Communion* is about "connectedness, belonging, participation in a whole, mingling of the self in the group, equal opportunity to contribute and to benefit" (ibid., 92), that improves the homogeneity of the community (ibid., 91—103). *Mortification*, assenting to humiliating rituals such as confessions and de-individuating mechanisms, provide a new set of criteria for evaluating oneself according to the criteria of the community (ibid., 103—111). *Transcendence* then relates to "universal human need" (ibid., 112) of belonging to something greater, and taking advantage of religious beliefs to institutionalise power, leadership and tradition in a community (ibid., 111—125).

Even though these utopian communities had a religious focus and strict moral and behavioural codes, and therefore are quite distant to today's design practice discussed in this research at hand, they also shed light to the importance of commitment in complex systems: commitment is a powerful process that helps to pursue what is interpreted valuable based on the ideal vision for the future. Becoming committed is not a rational decision or a simple act of offering and accepting. It is finding that person's self-interest links to mutual interests. The commitment-building processes highlight the humane aspect in systemic change, that is, a committed person is not firstly rational but loyal and involved: "he has a sense of belonging, a feeling that the group is an extension of himself and he is an extension of the group" (Kanter 1972, 66). It is a process, in which power, emotions and participation affects, something that collaborative designers often try to induce (e.g. Keinonen et al. 2013, 20; Lee 2013, 7; 307; Sleeswijk Visser 2009, 198—199; Soini & Keinonen 2011a). In participatory design, both involvement to the creative processes and appropriation of the outcomes are considered dependent to the level of commitment (Braa 1996; Brandt 2007; Den Ouden & Valkenburg 2011; Dervojeda et al. 2014).

In sum, commitment can be seen as a vital part of diffusion of innovations and systemic change. There are interconnected relations between the innovation, and a committed community comprising of individual people and organisations who give meaning to the innovations by using it or making interpretations through re-inventions, which together affect systemic change. Commitment, if it strengthens an existing paradigm, it also seems to enable people to, figuratively speaking, move mountains if they are committed to change.

3. The Empirical Research Approach

The research task in this dissertation is to study how did collaborative design in the IKE project facilitate systemic change of Finnish repair construction towards resident-oriented housing modernisation (henceforth resident-oriented modernisation). That is, the systemic change of repair construction is explored here as a process from a technically-oriented professional field that used to borrow its criteria from new building construction towards an ideal vision of resident-oriented modernisation. The ideal vision was created in IKE in 2004 and 2005, which pictures housing renovation as a practice that puts the residents in the centre with their needs, capabilities and interests, and a culture that considers long-term thinking in developing the built environment. The change process and different project participants' related activities are studied within a timespan of seven years between 2005 and 2011, including the project running time and its follow-up for six years. By analysing collaborative design research activities in the project and following the impacts for six years beyond the project realm, the study builds links between practical actions in project constraints, the emerging change in different vertical levels of the complex system of repair construction, and design's role in facilitating the change.

The broader research interest at hand is facilitating systemic change with collaborative design as an example of design's extending tasks from operative roles towards strategic contribution (Valtonen 2007). Design has reached the point where it is seen as an interesting societal actor that may provide valuable benefit when being incorporated to the innovation system (e.g. European Commission 23.9.2013; Kansallinen innovaatiostrategia 2008). Design is, however, difficult to define and measure, and has therefore earlier on been left beyond the core activities of innovation (Hobday et al. 2012). Often description of design contribution in regard to organisations and society involves more paradigmatic discussion than critical assessment (e.g. Björgvinsson et al. 2012; Mattelmäki 2006). Attempts to make design contribution visible include, for example, conducting assessments for return of investments (ROI) to communicate the benefits of design investments in Finland (dROI 2012). In regard to collaborative design, there are openings to follow the outcomes and learnings of practical design projects to understand what kinds of changes has taken place in organisation-level conditions (Hasu et al. 2014). Another aspect in regards to design and diffusion is studies that examines products as socially constructing entities. Examples of these are dissertations on domestication of design products in home as dwelling practices (Paavilainen 2013) and on fashion design constructing middle-aged women's social age (Iltanen-Tähkävuori 2007). Also the question how to create emotional links with innovation have been studied (Jordan 2000). All in all, evaluation of innovating in societal level and especially in regard to complex systems, that also EDIP is interested in (Thomson & Koskinen 2012, 8—9), has not yet found its form but has been recently taken as a focus.

Hence, this research aims at shedding some light to the contribution of design in regard to dealing with systemic change of complex systems. As the research subject as such would be too broad as well as still lacks a proper research body to be built on (see above), I see limiting this research to a single case with rather long-term research material and multi-method analysis a favourable framing. It enables me to grasp understanding of the quite complex issue, explore it in detail, and to build understanding of a whole through an example.

3.1 CASE STUDY AS A RESEARCH STRATEGY

Through a case study as a research strategy, research is aimed at producing concrete, context-dependent knowledge (Flyvbjerg 2011). It is a research strategy that offers a scene for discoveries from intense observation of real-life events. Case studies arose out of desire to understand complex social phenomena. It is said that cases have been around as long as recorded history, and after law schools showed the value of cases at teaching in the 1870s, the research strategy have been widely adopted within various fields such as sociology, business, psychology,

history, political science, education, social work, and community planning (Breslin & Buchanan 2008, 36—37; Flyvbjerg 2011, 302; Yin 2003, 1).

Following the wide target of application, there exist also various definitions for case study. In design research, the notion case study has mostly been used as an expression for a project with a certain topical theme or a sub-project, which resembles the definition of case study within business referring to business cases as holistically described examples of practice. When case study is considered as a research strategy, the focus is not only general labelling, such as calling any project a case, but drawing of boundaries for the individual unit of study between a case and its context (Ragin 1997). According to Ragin (1997), a researcher revises and refines research concepts during the research process to make the boundaries emerge and to clarify the distinction between the core research subject and its demarcating context. This is called *casing*, which is a conclusion of the research process, and may be the primary and most important finding of the investigation. Also other scholars present similar definitions. For example, Bent Flyvbjerg (2011, 301) states that "the decisive factor in defining a study as a case study is the choice of the individual unit of study and the setting of its boundaries, its "casing" [that is] a choice of what is to be studied".

What separates case study from other research strategies, e.g. experiment or history study, is this ability to retain the holistic and meaningful characteristics of real-life and contemporary events. The definite difference is not the scope of research as any research, according to Yin (2003), can be conducted for exploratory, descriptive or explanatory purposes. Gerring (2004) also defines the case study a particular way of defining cases, not a way of analysing cases or a way of modelling causal relations. When studying real life, the boundaries between a phenomenon and its context are not clearly evident and one of the research interests may involve covering contextual conditions. A case study strategy allows to explain, describe, illustrate and explore links between a phenomenon and its context.

Case study is this intensive study of a single unit for the purpose of understanding across a larger class of units. It means that a case study is about studying a purposefully selected case, not random selections, that unfolds in an explorative process of choosing cases and thorough research. The research process involves in addition to familiarity with a scholarly discourse, also intuitive procedures when selecting and framing cases. In the beginning of a research project, a case is selected on the basis of expectations about their information content. However, a case may turn out upon closer study to be telling about something different from what the researcher thought it would, and the framing of the research needs to be reassessed. This may be criticised as a weakness of the case study, but actually it is its main strength. "The main strength of the case study is depth—detail, richness, completeness,

and within-case variance—whereas for statistical methods it is breadth." (Flyvbjerg 2011, 314.) This kind of depth is considered to gain only through multifaceted exploration.

3.2 FRAMING THE LONGITUDINAL CASE STUDY

The case in this research is the systemic change of repair construction towards resident-oriented modernisation between 2004 and 2011, and examination of the facilitative role of collaborative design in it, as it was conducted during IKE in 2004 and 2005. Therefore, Finnish repair construction is not a study unit but composes the practical context of the project and this research. IKE then represents a project with temporal, resource and relational constraints within repair construction, during which the *ideal vision* (Carr-Chellman 1998, 373) resident-oriented modern-isation (or i*dea innovation* by Rogers 2003, 13) was collectively generated with the help of collaborative design. The extending role of design towards designing for complex systems is neither, strictly speaking, the study unit, but forms the context for the research interest as the identi-fied research gap relates to underdeveloped research body in regard to facilitating systemic change with collaborative design (e.g. Björgvinsson et al. 2012; Buur & Matthews 2008; Hobday et al. 2011; Hobday et al. 2012; Verganti 2009). Research on facilitating systemic change here also includes depiction of these contextual aspects that affect the analysis, but the main contribution of this research focuses on shedding light on collaborative design's role, capabilities and limits in influencing systemic change.

Investigating facilitating systemic change with collaborative design in the context of repair construction is a single case study. Robert Yin (2003, 40—42) lists five rationales for selecting only one case instead of multiple cases. The rationales are that the case should be 1) a critical case in testing a theory, 2) an extreme or a unique case, 3) a representative or typical case, 4) a revelatory case providing an oppor-tunity to observe and analyse a phenomenon previously inaccessible for research purposes, and 5) a longitudinal case to study a single case at different points in time.

This case study fills three of these rationales. Examining facil-itating systemic change with design from within IKE as a *longitudinal case* allows us to specify how connections between collaborative design research and society developed over time. This longitudinal case study is comprised of material from the project activities and a follow-up in the timespan of seven years between 2004 and 2011. The time intervals of two and six years after the project was finished were chosen to cover stages at which consequences should be identifiable in the field of repair construction. I ground this framing on an assumption that the more strategic objectives design deals with, the more complicated the task and therefore the longer should the time-span be for examining its conse-quences in order to understand its relational contribution.

The longitudinal exploration is further positioned in recent changes within the design profession that is extending designers' roles and responsibilities (Björgvinsson et al. 2012; Brown 2009; Gamman & Thorpe 2011; Thackara 2005; Valtonen 2007). Collaborative design of complex systems has become one of the professional design's broadening activities to being responsive through providing insights for various strategic purposes, but there does not however exist in-depth analysis of the contextual value of collaborative design projects. As a longitudinal study this research represents a *unique case* because it allows us to localise collaborative design within the web of society. The aim is to investigate how design may work for systemic change, that is, how collaborative design can be responsive with complex systems. While examining long-term consequences of design-related activities in the project, this research builds ground for discussing collaborative design in regard to systemic change as a temporal process with multiple factors.

Analysis of connections between practical actions and their impacts makes it also a *revelatory case* by providing an opportunity to examine the societal value of collaborative design by learning from the unique longitudinal case. One of the special characters of this research is that it involves my own involvement and experience. While the analysis is based on reflective process that synthesises a maker's self-reflection and input of participants, research builds a bridge of understanding between practical project work to meanings and impacts of it.

3.2.1 Research material from a timespan of seven years

Based on my interest of understanding practical collaborative design in relation to a longer-time progress beyond a project, I have gathered research material from a timespan of seven years between 2004 and 2011. The materials include altogether 63 participant interviews and 136 related documents, 98 project documents and personal experience on IKE's running time (Fig. 3.1). The material cover the project running time in 2004 and 2005, and follow-up two and six years after the project was ended. Eventually material spread over the whole timespan of seven years because material also include documents on developments between 2005 and 2011.

The amount of material is large because of the chosen research strategy. Case study inherently involves material from multiple sources, and longitudinal case study also include material from several points of time (Yin 2003, 97—101). The advantage of using multiple sources of evidence in case studies is that it "allows an investigator to address a broader range of historical, attitudinal, and behavioral issues" and to develop "converging lines of inquiry" in a manner of data triangulation (ibid., 98). Hence, the different materials are gathered in this research in order to corroborate the same phenomenon in analysis at least with two sources.

PROJECT IKE	DEVELOPMENTS BASED ON THE INNOVATION RESIDENT-ORIENTED HOUSING MODERNISATION		

PROJECT IKE | DEVELOPMENTS BASED ON THE INNOVATION
RESIDENT-ORIENTED HOUSING MODERNISATION

PRACTICAL PROJECT WORK as designing researcher and project manager

59 INTERVIEWS for the project IKE participants

4 INTERVIEWS second interviews for key people

98 PROJECT DOCUMENTS plans, graphic design, user study and work-shop material, presentations and reports

136 DOCUMENTS ON DEVELOPMENTS
R&D project plans and reports, publications,
guidelines, decisions, websites, media, and examples of
new services, solutions, practices and communications

2004   2005   2006   2007   2008   2009   2010   2011

FIGURE 3.1
The longitudinal research material is comprised of four types:
project documentation and practical project work in IKE during 2004
and 2005, participant interviews in 2007 and 2011, and documents on
developments between 2005 and 2011.

From the project running time, there are documents and
my personal experience in the practical project work as designing
researcher and project manager. The 98 original project documents
include plans, graphic design, field data from the user study, workshop
material, presentations and reports that I together with my design
researcher colleagues, project group members and other involved
participants generated during preparing and running the project
within 14 months. The project documents are henceforth referred in
the following text with a combination of letter *P* prefix and *identifier
number* (P01—P98). These and all other research material are originally
in Finnish. I have translated the quoted material samples in this dis-
sertation in which I have used the terminology from *the vocabulary of
real estate business* by The Finnish Association of Building Owners and
Construction Clients (RAKLI) when available (D122).

The project material is natural in the sense that the decision to
use IKE as research material in this dissertation was made later. However,
due to the same reason, my personal experience in the project work is
not documented in project diaries or others per se. As a consequence,
the research material may lack some details. Instead, the project
material is without doubt authentic and not biased with encumbrances
of hypothesis or other aspects that might have affected creation of
it. I started the analysis based on my personal project experience and
the project documents the same year the project was ended and even
though many years have passed by before publishing this dissertation
continuous process has enabled me to reconstruct my thinking behind
practical actions retrospectively.

The interview material is a compilation of 59 interviewees' viewpoints and when adding to the interviews also my practical project work experience, 90 percent (60 out of 67 participants) of the IKE participants' perspectives are included in this research, which secures extensive representation in analysis. Altogether 33.5 hours interview material include three social groupings of residents (8 hrs), professionals (20.5 hrs), and design researchers (5 hrs). The distribution of interviews is depicted in figure 3.2 and the interviews are henceforth referred in the following text with a combination of letter *I* prefix and *identifier number* (I01—I63).

Interviewees represent 29 different organisations from construction, renovation and engineering business, communications, governmental and city organisations, housing companies, NGOs, real estate management, manufacturing, and research and educational institutes. The interview material is divided into three social groupings—repair construction professionals, design researchers and residents—that with their different angles help to reach depth in analysis.

The *professional* viewpoint became the main object of analysis as they were mainly involved with the systemic change. 85 percent of the participated professionals (34/40) were interviewed in 2007. Additionally, four key players were reinterviewed in 2011. Professionals represent all roles in IKE: over half of them were invited participants attending single events, more than third represent project and/or steering group members who realised the project, and three professionals are building managers who were interviewed about the replumbing projects in the studied housing companies. Analysis of repair construction professionals' interviews

FIGURE 3.2
59 participants including repair construction professionals, design researchers and residents were interviewed about the IKE project two years after it was finished in 2007, of whom four key people were interviewed again in 2011.

TOTAL 59 INTERVIEWS OF 67 PARTICIPANTS	SOCIAL GROUPING		
ROLE	Professionals	Design researchers	Residents
Project and/or steering group members	13	2	
Invited participants	18	3	
Informants	3		20

and related documents together provide details, richness, completeness and variance (cf. Flyvbjerg 2011) on the project and its follow-up developments at Finnish repair construction. Especially those interviewees who have decades of experience in repair construction, were able to shed light to proportions of collaborative design's role in making change in the field in regard to IKE.

The *resident* viewpoint stemmed from their participation in the project as informants who shared their experiences in renovation projects. The residents are the only social grouping that is fully represented in the research as all 20 residents who participated as informants in the project's user study and following workshops were also interviewed in 2007. The interviewees had participated in different parts of the user study and workshops, some only attending an interview or a focus group discussion while some contributing throughout the process by also attending in a probes study and several workshops. The interviews in regard to this dissertation bring out the laypeople viewpoint that highlights versatile aspects from everyday living, quality of execution, and more general aspects on professional renovation practice.

Us, three *design researchers*, formed the research team in the project who along with other design researchers immersed into the complex world of repair construction. The 71 percent interviewed design researchers (5/7) were either project and/or steering group members or occasional participants in workshops (the representation is 86% if the author is included). The design researchers' maker viewpoint has stayed in foci throughout my doctoral research, particularly from the situated perspective to learn from designers' practical contextual applying of methods and approaches instead of aiming at writing a recipe for a methodological tool box (Lee 2012).

These interviews were conducted by me and a research assistant. I conducted the four key player interviews in 2007, who were reinterviewed in 2011. They were representatives of each partnering organisation in IKE who I presumed to offer the broadest possible perspectives to the situation and on the movements at repair construction and also in wider society due to their executive positions. I wanted to discuss with them quite openly through thematic interviews to cover issues that they regarded important. Other 55 interviews were conducted by a research assistant through semi-structured phone interviews based on a set of questions. The idea of the phone interviews was that, firstly, this way as many project participants as possible were reached to get their feedback (90% of the project participants), which would not probably happened with some sort of a questionnaire that would have been another resource-wise option. Secondly, an assistant conducting the interviews was thought to allow the project participants to speak more freely than directly to me as the person whose work was examined as part of the interviews.

Interviews in 2007, two years after IKE had been finished, concerned interviewees' interpretations on the project and methods, and their perception of the project outcomes and impacts to enquire into commitment to the innovation resident-oriented modernisation loosely following ideas from Kanter's (1972) commitment mechanisms. The set of interview questions included altogether 45 questions that were divided to four main themes (Appendix 1).

- The first theme was about the overview of IKE, how people recalled the project, perceived its outcomes and saw the link with their current organisation or housing company.

- The second theme comprised a cluster of questions about the memories and experiences of each project activity. The detailed inquiry involved the user study, workshops and project and steering group meetings, in regard to the work style, roles, and personal and broader benefits. From these questions, only those questions were asked that involved project activities the interviewee had been involved with.

- The third theme also comprised of a cluster of questions about the impacts of the project and its innovation (the ideal vision). Particularly interviewees' perceived need for new practices, updating training and new colleagues in the organisation based on the insights in the project were inquired. All the possible development projects and novel solutions that were based on or related to IKE were listed with detailed description. Also all sorts of difficulties and setbacks on the hindering development and change were asked.

- The fourth theme was about concluding the interviews by asking about interviewees' interpretations on the ownership of the project, sorts of insight they kept on cherishing, and their assessment on the impact of the project. To get an equal reference point for the interviews, all were asked to describe with their own words what does resident-oriented modernisation mean.

The interview questions were individualised for the three different roles in the project (project and steering group members, invited participants and informants). Each interviewee was asked between 21 and 37 questions according to their roles in the project. The same set of questions was used also as a loose script for the key players in addition to more open

discussions. Additionally I asked the four key people about the developments that had led to launching the project and their considerations on repair construction as a professional field.

Originally interviews were planned to be conducted only once but it is typical in case studies that the original material gathering plan needs to be adapted to findings (Yin 2003, 60—61). During the first interviews it became evident that the progress in repair construction required a longer time to occur, to diffuse, and therefore, to be observed. Therefore, in order to examine diffusion of the innovation at Finnish repair construction, loosely following Rogers' theory (2003), I interviewed the key players again six years after the project was ended. In the second interviews for the key people, I focused on three main themes.

- Firstly, I presented a map of impacts of IKE to the interviewees, which they were asked to check whether the tentative analysis on developments in repair construction seemed right. Some details were corrected and also new examples added that now seemed important.

- Secondly, recent developments were discussed to broaden the analysis until 2011. New development projects and solutions that had occurred after 2007 were asked to be added to the map. Also the connections between IKE, developments by 2007 and the current situation were discussed.

- Thirdly, the interviewees were asked to elaborate design researchers' role in development at repair construction. Many insights supported findings from the research material in 2007 but also new aspects were raised that not only involved practical activities but also the intangible issues such as mindset.

Interviewees in both moments were asked to give, send or refer to documents that would support their story on developments at repair construction. Additionally, I and the research assistant made several Internet searches to collect further documents based on references during interviews in order to get another source of evidence and to get more detailed background information on issues that were only often briefly mentioned in the interviews especially when conducted by research assistant. Eventually the list of documents includes 136 documents about various R&D project plans and reports, publications, guidelines, decisions, websites, media, and examples of new services, solutions, practices and communications. The documents on developments are henceforth referred in the following text with a combination of letter *D* prefix and *identifier number* (D001—D136).

The research material and my analysis tell mostly about people, their viewpoints and activities. Therefore, as a result of ethical considerations in this research, I have ended up with two-sided treatment. Firstly, residents are treated anonymously, similarly to how they were anonymised in IKE, in such a way that all the identifications in regard to the individuals and their housing companies are hidden. One might wonder whether the residents would have wanted to have their voices heard as persons but as many of the residents whose quotes are included in the text forbid the use of their identifications in this thesis, I decided to treat all the residents similarly as anonymous representatives of residents. They are private people who I do not wish to put at risk of any inconvenience. Secondly, professionals are being openly referred to with their real names and affiliations with their informed consent (Koskinen et al. 2005, 281). The interviewees originally agreed with talking openly with their own names. They were told that the research subject is to examine the systemic change of repair construction towards resident-oriented modernisation and the role of collaborative design in it, which is not aimed at scrutinising individual interviewees but the whole. Those interviewees whom I have quoted, some of them having strong characters in this book, were sent copies of the respective parts of the manuscript and gave their permission to publish with slight corrections. The reason behind openness is that the project and following developments is a public matter that, particularly, in a small country like Finland makes the constellation of involved professionals easily recognisable. If the interviewees would have been anonymised, the analytical precision would have been lost because it is not enough to change names and organisations, but it would have required changing all details, including references to the original documents, that could have referred to the context and eventually revealed the people. (Koskinen et al. 2005, 285.) This treatment would have lost the original aim to deliver a rich and detailed description of the systemic change, and prevented to build the research body on investigating developments in Finnish repair construction.

3.2.2 Multi-method analysis

My main method of the qualitative analysis is the detailed description of the changes that have occurred at repair construction in regard to the design research activities in IKE, in which the evidence is the long-term impacts. When having a vast array of research material, the main challenge during analysis has been on deciding upon how to combine a diversity of perspectives and proximity to particular people that seemed to have a special relation with issues under study. The analysis follows loosely analytical induction as my analysis alters between focusing on detailed analysis of few individuals' perspectives and testing the first interpretations with the entire research material (Koskinen et al. 2005, 235—237). Taking a closer analysis to key players' interviews, expanding

the analysis to include all other interviews and documents, and carrying out my personal reflection-on-action in IKE allows me to examine both diverse perspectives and also gain descriptions of distinctive perspectives. This multi-method analysis comprises of six stages that are described in the following.

The *first stage* of the analysis involves personal reflection-on-action immediately after the project was finished and I had decided to study the case. My reflection related to four particular project events, the three user experience workshops and the synthesis workshop. The objective was to understand workshops as a method and the role of facilitation in those. In the first analysis, workshops appeared to be a collaborative arena where sharing perspectives and creating shared visions became possible (Soini & Pirinen 2005). The workshops provided means for generative research that in addition to knowledge creation created concepts for follow-up development work. The workshops were events that gathered various actors to face-to-face collaboration and challenged them to perceive anew the ordinary ways of thinking to design for the future. I also analysed the facilitation practices in IKE based on John Thackara's (2005) seven design frameworks. It seemed that the design researchers emphasised in their workshop facilitation as a means to generate actively with others a novel vision for repair construction through re-combining varying people's experiences (Soini 2006). They aimed at creating situations where the statement "share the goal; share the work; share the results" (ibid., 221) would become fruitful. With this first stage analysis, I came up with a working hypothesis that the events were important milestones in IKE but they belonged to a more complicated process that was not to be explained simply by looking at the events but there existed other levels such as regular project and steering group meetings and personal activities that were important part of the collective work.

In the *second stage*, my analysis moved from the perspective of my own experience to looking at the whole project and its connections with developments at repair construction. The amount of research material was exhaustive, including 59 interviews and 28 related documents (that was about to grow), and I decided to follow induction (Koskinen et al. 2005) and first analyse the four key player interviews (I01—04) to form an initial analysis that later on would be tested with the rest of the research material. The key players initiated the project, were leaders in their organisations and as such high-level representatives who also had a vantage point at repair construction through their networks. I analysed their narratives, how they talked about IKE, and its links to the field. The narratives focused on their personal viewpoints in relation to developments in the domain, and highlighted their personal commitment to the project and its innovation (the ideal vision). The initial analysis comprised of two aspects: the account of developments based on and

related to IKE, and the meaning of commitment in changing repair construction. The initial analysis included many sorts of timeline analysis that highlighted innovation consequences (as they were called that time based on Rogers 2003 thinking), that encompass 1) raising general awareness of residents and modernisation within housing renovation and public, 2) creating new practices to respond to orientation for serving residents, and 3) a variety implementations of the innovation within organisations and activities (Soini & Keinonen 2011b). The key players' commitment processes were analysed following Jeffrey Pfeffer's (1981) ideas on commitment: technical and social pressures inspired the key players to try out a novel approach of empathic and participatory design research; the key players interweaved the project ideas in their development networks and so pronounced on the vision as their public opinion; and the unique engagement of residents and professionals in workshops provided them new insights (Soini & Keinonen 2011a). In this key player analysis, it became visible that IKE seemed to have exceptionally extensive impact for a preliminary study. Much seemed to rest upon the key players, who also initiated the project, and were motivated to develop repair construction practices. They were personalisations of the commitment to the resident-oriented modernisation who had been able to take advantage of the innovative project methods design researchers had applied in the project.

According to the representative from the Ministry of the Environment (I04), changes would take decades to be implemented and therefore interviews two years after the project finished did not tell about the real situation. To study whether the development direction was sustainable, I interviewed the key players four years later, six years after the project had finished. At this *third stage*, the initial analysis was approved with slight revisions and additions of the recent developments. The ideal vision resident-oriented modernisation was still regarded useful, and the development direction continued and activities extended.

It was not yet apparent whether the developments were to the key players' credit or were there other project participants also involved. Based on the analysis on developments until 2011, I launched the *fourth stage* of the analysis. When testing my initial findings with the rest of the interviews (I09—I59) and the final amount of related documents (D001—136), I built a map of links between the project and its innovation in regard to repair construction with help of another research assistant by using *Gephi* that is an interactive visualisation platform for complex systems networks. It appeared that there existed several professional individuals, organisations and projects that were continuing the work we started in IKE, but the network analysis did not seem to depict reasons for appropriation. I applied *innovation-decision process* model (Rogers 2003, 168—192) to conduct a detailed analysis of decisions and relations of activities in IKE and later activity, that is, I analysed each interviewed

participant's decision process. Whereas majority of diffusion research typically involve variance research as a type of quantitative data gathering and analysis, the analysis of the innovation-decision process borrowed from Rogers' (2003, 196) diffusion of innovation theory is qualitative in nature. It focuses to the sequence of events and "the nature of the process" (ibid., 196), which is thought to require "less structured [data gathering methods] and might entail in-depth personal interviews" (ibid.). Following these ideas, I tried to depict the temporal location of particular innovation-decision process stages in regard to the project (before, during or after), and the outcome of the process (rejection or adoption) based on the interview material. Based on the analysis of the individual adopters, I built a categorisation of adopters, which depicted the typical links between prior, project and after activities in regard to the innovation. I also executed some simple quantifications (e.g. the ratio of adopters and rejecters) to help the qualitative analysis through finding repetitive connections and typicalities for qualitative inspection. In this way, the entire theory of diffusion of innovations is not applied here (e.g. adopter categories Rogers 2003, 267—299; cf. Moore 2001), but only the innovation-decision process is used as an analytical tool within the multi-method analysis.

By this far, I had conducted my personal reflection-on-action on particular project events, initial analysis on project impacts and related commitment based on the key players' insights from 2007 and 2011, and a partly quantified analysis of the innovation-decision processes. The narration was not yet pulling together but there still seemed to be some unexplained discontinuities in the story. Therefore, I conducted a thematic cross-analysis for the entire interview material with *ATLAS. ti*, which is a qualitative data analysis software. I chose central concepts from the analysis with which I categorised the research material to complement the narration. These concepts were the innovation resident-oriented modernisation, repair construction as a professional field, project events (workshops and meetings), user study, and the role of collaborative design. This analysis hid personalities and organisations that had been earlier on seen as the reference point to interpretations, and allowed the material talk in terms of the thematic content. Additionally, I deepened my analysis with building links between the project premises, project work, the innovation and systemic change by cross-checking all documents also. In order to find the balance between details and the whole story, I needed to analyse some contextual issues, such as the interpretations of the limited housing company system among residents or phases in project activities, in detail that have not been presented in the final version of this dissertation. Many details although helped me to build the story that in the end aims at delivering an explicit and easy-to-follow interpretation that describes the research material comprehensively (Koskinen et al. 2005, 231).

The *sixth stage* was to go back to reflection-on-action. It meant at this point that, in addition to reflecting the findings with literature, I have tried to elaborate the analysis through using my own memories and experience as a tool to cross-check whether I have considered all central aspects. In this final stage, the main emphasis was though in finding sort of a balance in the narration that it would convey details, richness, completeness and within-case variance (cf. Flyvbjerg 2011), in which the analytical tool was my own experience.

3.2.3 Tension between personal interests and objectivity

The six stage analysis in this dissertation has been a journey moving between my personal insights and an objective analysis. Within that process, there is a certain tension underlying this analysis between personal interests and objectivity. This tension foremost situates between personal experience as a designing researcher in IKE and the norm of objective analysis of research material.

This kind of a research strategy that embraces the maker perspective as part of the analysis is quite typical in design research not only in Finland but internationally (Brandt 2001; Gaver & Pacenti 1999; Halse et al. 2010; Heikkinen 2013; Koskinen et al. 2003; Sanders & Stappers 2012; Thorpe & Gamman 2011; Vaajakallio 2012), even though it wouldn't be acceptable in some other research fields. The researcher's stance on research subject is more generally a fundamental issue that needs to be addressed early on in the research process because it will affect decisions during the research (Dobson 2001, 284). Flyvbjerg (2011, 310) adds that research is a form of learning like any other human learning process, and therefore the proximity of the researcher and the research subject needs to be taken into account. When a researcher is placed within the context being studied, she can achieve the most advanced form of understanding, which means understanding the viewpoints and the behaviour characterising social actors (Flyvbjerg 2011, 303).

In this research, I took the proximity as a starting point for my research process and knowledge creation. I have certain professional background that lends me perspective and motivation to this research. I got educated as an industrial designer who minored in user-centred design, and have later on applied my training to more complex and open-ended issues such as repair construction. I am dedicated to empathic and participatory design, and it has affected my research framing as well as choices in analysis and documentation, as can be seen on the pages of this thesis. In this book, I have accepted my stance as a maker who wanted to learn from her past work through getting feedback from others. This kind of contextual depth in examining practical actions of design and its products is the key to understanding design because design, according to Penny Sparke (2004, 8), is an activity that should be

considered as a relativistic, pragmatic and contextualised phenomenon. Maarit Mäkelä (2009) says that own experience is vital to understanding of the essentiality within art and design where "the process of making and its products are strongly connected with the source of knowledge", and therefore also the ideal vision, that turned out to be an adopted innovation, is one part of examining the making.

Even though personal perspective as part of knowledge creation may be justified, it does not clear away the fact that it has been quite difficult. I have tried to find the balance between personal interests and objective analysis through the extensive six stages analysis that has helped me in moving about between different analytical stances. A difficulty in this process has been in dealing with the emotions that the analysis has aroused in such a way that it would not have hindered a balanced narration. During the analysis process, my feelings have shifted between being naively proud of the vaunted work we did in IKE, feeling our way of working useless in the complexities of systemic change, and eventually, becoming contended with the realisation that there exists a role and contribution for design that locates in facilitation. It was healthy to start seeing our work within a bigger picture, and it felt necessary to find the emotional balance in order to finish the research.

My aim is to depict this as balanced as possible understanding in the pages of this dissertation. With the analysis that combines material-based qualitative and quantitative analysis, and reflection-on-action of a longitudinal single case study, I aim at attaining a multiple wealth of details, and thus unfolding "a nuanced view of reality" (Flyvbjerg 2011, 303). I pursue this nuanced view of reality through narratives that according to Flyvbjerg (2011, 312) develop descriptions and interpretations of the phenomenon under study from the perspective of participants and researchers. According to him, this kind of narration cannot start from explicit theoretical assumptions, but instead they begin with an interest in a particular phenomenon that is best understood narratively. Moreover, narratives provide a method and a process for this descriptive case study. The narratives help to move between an individual and a nation, a maker and a spectator, within and out. It means that during the research process I have changed perspectives between *from within* my personal work experience as a design researcher, and *out* from partners' multiple perspectives.

4. The Complex System of Finnish Repair Construction

This is the story of collaborative design becoming immersed into the complex system of Finnish repair construction. The story evolves from establishing the partnership between repair construction professionals and design researchers, to designerly ways of working within project constraints, generating a starting point for change in the professional field of renovation, and eventually to consequences beyond the project.

The story relates to a similar situation that we had in the 1970s when Rittel and Webber (1973) published their acknowledged article *Dilemmas in a general theory of planning*. The article highlighted the need to reframe the planning practice. Planning for large social systems such as roads, sewer systems and housing had before been seen with rather clear boundaries and therefore involved clearly defined planning tasks, but the public criticism had become to press the profession to re-examine its values, goal-formulation, problem-definition and equity issues. Repair construction in Finland shares many aspects with the 1970s planning in the USA. Repair construction is structured in the Finnish society as a professional practice whose actions concern planning large socio-cultural systems of renovating the existing building stock that lay out long-term consequences. It relates to, at least, construction industry, environment, housing markets, national wealth, affluent society and people's everyday life (D018; D061; D073; D103; D116).

Repair construction of housing also received a lot of criticism in the early 2000s. Public discussion had defined the professional practice unjust, greedy and of poor quality. Similarly to the need of reframing the planning practice at the time it was beginning to acquire professional competence (Rittel & Webber 1973, 155—156), the criticism toward repair construction also took place when it was only beginning to form a professional practice to deal with the renovations (D119, 3). Due to the young age of the Finnish housing stock, the first wave of renovations took place in the 1990s when the facades were renovated, while replumbing projects started to become frequent in the beginning of the 2000s (P92, 9—11). Replumbing surfaced the criticism because the professional and everyday realms crossed when renovations entered people's homes. The emphasis of the professional practice was very much in technical and measurable aspects such as technical execution options, budget and schedule, but professionals were unfamiliar with service orientation.

IKE was established to deal with the perceived needs concerning the criticism combined with pressures in executing renovation projects, and also anticipated opportunities for improving the professional practice (P03; P92, 6—7). For the first time in the project, repair construction professionals wished to explore the system as a combination technical and social dimensions (I01—02). Even though the professionals who initiated the project had experience for example on improving accessibility of the existing built environment in regard to retrofitting elevators and social aspects in regard to suburban development, inducing housing companies to launch renovation projects, and considering holistic real estate management (I01—04; I56; I60; D048—049; D052—053; D066; D093; D123), they needed external support for their exploration. They ended up in collaboration with design researchers from the Future Home Institute at the University of Art and Design Helsinki who were known to have focus on user-centred design (I01; I56).

The collaboration resulted in the ideal vision (idea innovation) resident-oriented modernisation that was used for changing Finnish repair construction in dimensions of public discussion, research and development, business, and governmental guidance. A building manager describes the change of perspective that permeate the progress:

> "Renovation was carried out in the past pretty much
> on technical grounds. Technology dictated things, the
> technical result and by no means the residents. The
> most important thing used to be to look at the result:
> keeping to the schedule, meeting the cost estimate,
> and whether the technical work was good, reasonable,
> expected. We did not care how these three was
> achieved, but our approach was like being a bull in the
> glass shop. It was the most important thing [in IKE]
> to take the resident perspective as a strong aspect."
> (Building manager Arto Huttunen, I21.)

The building manager was one of the people who participated in IKE and committed to continuous development of repair construction with a shared agenda based on the ideal vision. How did this happen? What were the motivations behind participating in the project that eventually led for some participants in implementing change? How did collaborative design get involved in changing Finnish repair construction? This chapter illustrates the premises of the encounter between technically-oriented repair construction professionals, collaborative designers who emphasised empathic and participatory approach, and everyday people, residents who ultimately were the experiencers, users and clients of housing renovation projects.

4.1 CHALLENGES AND OPPORTUNITIES IN FINNISH REPAIR CONSTRUCTION

Repair construction has quickly become an important professional field in Finland. Repair construction is not an industry itself but is a particular application field within construction industry, with a purpose to maintain a building or a space within a building or to improve its condition to a preferred one (D130, 5). Repair construction, according to *the vocabulary of real estate business* (D122, 37), is "construction that alters a previously constructed entity towards the desired result. Repair construction can be carried out as a separate project or in the style of annual repair. The aim of repair construction can be e.g. to make the target more suitable to its use (modernisation), to preserve or restore cultural values (restoration (1)) or to change the target's purpose of use (rebuilding)." Different related words include renewal, rebuilding, restoration, refurbishing, maintenance, annual repair, repair, and demolition (D130, 5).

When considering practically, repair construction of apartment buildings mainly concerns two the most necessary repairs: the building

envelope (roof, facades, balconies and windows), and the water and sewer lines that are professionally called HPACE systems (heating, plumbing, air-conditioning, electricity) or more casually, replumbing. The first larger professionally executed wave of apartment building renovations—mostly envelope repairs—took place in the 1990s making renovations a rather recent practice for construction industry (I01; I04; D119, 2). Before that repairs were mostly conducted by building owners themselves or by their own organisations, or related to public buildings (D109; D119, 2). The second wave of renovations started at the verge of the new millennium when the housing stock built in the 1950s and 60s entered replumbing (I02; P92, 11). Moving closer to the 2010s, the main difference was broadening the interest from the condition of the buildings towards holistic real estate development including considerations on those people's wellbeing who are inhabiting the buildings (I01—02; 104; D119, 3; D125, 3). It was becoming clear that buildings and apartments were built to meet needs and values from half a century back and while needs have changed and continue to do so, the environments had become functionally and culturally outdated. As housing preferences are becoming more diverse, also buildings should be proactively developed to better meet contemporary residents' needs (P92, 6; D125, 7).

The value of repair construction has increased steadily since the mid-2000s and has almost equaled new building construction with its value of 9.6 billion euros per year, of which over half comes from housing renovations (D105, 3; D117, 11; D018). Repair construction employs 80,000 persons in the construction sites and 70,000 persons in the construction industry, services and commerce (D116, 9). According to a specific repair construction community website (D127), repair construction products and services are offered by about 900 companies, of which there are about 600 firms and product manufacturers around 300. In addition, there exist a couple of hundred related energy efficiency products and services. When making a search for the business area "construction and renovation" in a specific Finnish construction business network site, there are 12,945 companies listed also including SMEs and micro firms offering their services for repair construction (D131). The most obvious disciplines working within renovations are engineering, architecture, construction, and specialised construction for different process phases involving such as demolition, plumbing and electrics. Their professional pride is typically in technical know-how and straight forward execution of their tasks (I60).

Even though the business aspects grew rapidly in the early 2000s, the construction professionals did not appreciate repair construction, especially housing renovations, as a feasible application field. It was not even identified as a separate activity of construction industry, until the Statistics Finland published its first release on housing repairs in 2003 at the same time when HPACE systems reached a quarter of total

repair costs of housing, an increase from the previous year by as much as 82.6 percent (D128; D129). The construction industry developed its practices based on new building construction that is a techno-economic system, where co-operation, decision-making and financing are typically negotiated business-to-business. That is contradictory to the reality in apartment building repair construction sites where laypeople—residents—permeate everything especially in limited liability housing company (housing company) renovations; they are the clients paying the professional renovation activities, people who need to cope with changes in their duly routines during construction, and end-users living with the final results. (I01—02; I04.)

In the early 2000s, the construction industry was thus not used to take into account the particular characteristic of private owning or other more complicated aspects involving housing and people's individual aspirations. The issue was however unavoidable. Majority of Finnish apartments are privately owned according to a specific form of limited liability company regulated in the Limited Liability Housing Companies Act (D094). It is a form of shared owning, which makes renovations more complicated decision-wise because of the required majority rule that decisions shall be made by the majority of the votes cast. The difficulty of housing renovations of housing companies is that decisions are made by laypeople who do not understand the principles of renovation and maintenance of the built environment (D018, 3).

Moreover, one of the biggest challenges is that housing companies are "single-project-developers", meaning that people who lead a renovation project in a housing company face such a large construction project for the first time in their lives, and additionally many times with none what so ever experience on construction work, and are not likely to involve another similar project in their life time. Those people gain a lot of experience during a replumbing project but once the process is finished, the acquired know-how is seldom reused. For the professionals' part, they move to another project where they need to start everything from the scratch by repeating the terminology, principles of the renovation process and other basic issues. (I21—23.)

In sum, repair construction is a complex system of its own that vertically incorporates relevance in regard to maintaining the affluent society by governmental and shared activities, an emerging professional practice actualising in private and public organisations, and consequences in everyday life among residents. All these aspects pose serious societal challenges that also open new opportunities (I02; I04; I07—08). The greatest challenge is that many renovations have been postponed and the approximate renovation debt (calculated as the depreciation less than 80 percent of the replacement price) has grown to 30 to 50 billion euros (D116, 7). It means that more renovations should be conducted but there does not exist feasible practices and solutions that would enable it. This

is a societal matter also because the built environment is seen as the national wealth. The value of the residential and non-residential buildings was in 2009, 263 billion euros, a third and the biggest single factor of the total 770 billion euros national wealth (D117, 2). The fundamental opportunity is then that repair construction has been able to steadily offer increasing employment while the volume of new building construction has fluctuated and decreased over the years (D103, 25). The sustainable growth trend is built on the technical fact that the Finnish housing stock is ageing. The peak years of building apartments were between the 1950s and 1970s, while today the building stock grows less than two percent yearly (P92, 9; D116, 9). The technical erosion of the existing buildings require significant renovation and improvement that are calculated to quadruple the envelope repairs, and to reach twentyfold water and sewer line repairs between the 2000s and the 2020s (P92, 9—12). Repair construction is a complex system, in which challenges and opportunities interweave, and the essential question is how to deal with this complexity.

4.2 BUILDING A SENSE OF OWNERSHIP DURING THE IKE PROJECT PREPARATION

While the rapid and steady growth of housing renovation anticipated opportunities for the construction industry and even though serious problems and needs for development had been perceived, there was a decade long period when there was not any significant research and development or allocation of business resources going on at repair construction. However, there was also a small group of experienced people who wished to revive investing in development and to do deal with the growing amount of housing renovations. Juha Salmi, Jouko Taskinen and Risto Vahanen had a casual meeting in autumn 2003 where they came up with the idea of a development project in which the population trend and ageing of buildings in Finland are combined.

> "There and then we found the basic idea of IKE that people are getting older and buildings are ageing, and—lo and behold—they have been observed from quite different perspectives. There exists the aspect of social mantra and then the laws of physics point of view, engineering point of view. And they have never encountered. We thought that, yes, they will [...] come across at large renovations." (CEO Juha Salmi, I01.)

In this basic idea of uniting technical and social aspects of renovation, the trio joined their extensive experience on repair construction and the first wave of developing repair construction in Finland (Fig. 4.1). Their experience stemmed mostly from the era of the Great Depression of 1990 that had had a great impact on the Finnish construction industry: it had paralysed new building construction. Repair construction was

used to save the industry when the recession affected the Finnish construction industry between 1990 and 1996; almost all new building construction was stalled, and the main income came from building state subsidised apartment buildings or renovations of housing companies (D073, 27; D109, 48). To give an example, chairman of the board Risto Vahanen saved his company Vahanen, a family business he continues after his father, during the recession by focusing on facade renovation projects with housing companies on by applying their construction engineering expertise and facility renovation experience from a half a century (D109, 47—48).

CEO Juha Salmi of construction communications company Image Builder and his associate Jouko Taskinen then had been involved in the first developments for repair construction in the 1990s, which the state of Finland and municipalities had launched to boost construction industry during the recession. One of the first projects was the national R&D program on repair construction called "Remonttiohjelma" that introduced new practices for long-term real estate management such as condition assessment and condition survey between 1992 and 1996 (D006, 15; D032). At the same time the city of Helsinki granted 50 percent renovation subsidies in two different projects, one called the "A" project for tenement blocks in 1993 and 1994 and the other "As Oy" project for housing companies in 1996 and 1997 (D049; D053). In addition to realising the communication of these projects, Juha Salmi also led the communications program on suburban renewal called "Kotilähiö kuntoon" that promoted accessibility when making renovations between 1995 and 1999 (D093). The multichannel communications took advantage of magazines, television programs and training events, and even launched the national suburb day.

FIGURE 4.1
The first wave of developing repair construction in Finland arose from the Great Depression of 1990 and withered along with the economic boom. The proposal for the IKE preliminary study and following program aimed at reviving development.

The period when the Great Depression of 1990 impacted on the Finnish construction industry

"REMONTTIOHJELMA"
National r&d program on repair construction

Proposal for IKE preliminary study and program

"KOTILÄHIÖ KUNTOON"
Communications program on suburban renewal

Accessible residential quarter study

Inquiry on retrofitting lifts

"A"
Subsidy projecy

"AS OY"
Subsidy project

1990   1995   2000   2005

Even though the first wave of R&D on repair construction quickly subsided for almost a decade, when the economic situation started to improve after the Great Depression of 1990 and new building construction started to grow again (D073), Salmi, Taskinen and Vahanen did not forget their experience but wished to seize it.

> "We were bothered by the fact that the economic boom cut the developments. [...] It had fallen, it was in a quagmire. We kind of dug it up. Repair construction went on, and increased its stake all the time but it had been divided to two sides. Facility construction has much involved changing the purpose of use, in which the professionals are dealing with each other. Then, at housing, as we saw in the suburb program [Kotilähiö kuntoon], that the rental houses were repaired meticulously by professional facility management such as VVO and Sato. Housing companies envied them from aside, and ordered a condition assessment tops." (CEO Juha Salmi, I01.)

The trio built their sense of ownership on the cause through their vision of improving repair construction of housing companies by putting ageing of people and buildings in parallel. Based on his experience from those projects, Vahanen knew that there were not proper processes that would support renovation projects. On the other hand technologies were outdated and the business field was out of control. On their part, Salmi and Taskinen had learned that housing company renovations involve the most difficult clients and the worse professional actors in the construction industry. Together they understood that the oncoming growth of repair construction required more powerful actions than developments by themselves in their own organisations. The trio offered their idea as a discussion initiative to the Head of Building Unit Helena Säteri in the Ministry of the Environment (ministry). Säteri thought the initiative was timely and started to prepare with the trio and her team in the ministry a project that was called at the time "IKE - Ihmisten ja kiinteistöjen elinkaari" (in English the life cycle of people and buildings). (I01—02; I50; I56.)

One of the corner stones during preparing the project was to find a suitable research partner for which several suggestions were made. Along the discussion it was agreed that the project would need an alternative approach than their previous technically-oriented partners, such as represented by the technical universities or the Technical Research Centre of Finland (VTT), used to have (P02). Säteri and others wished to invite a new partner who could open fresh perspectives. Juha Salmi had worked before with Kimmo Rönkä who had been conducting research on accessible residential quarter and retrofitting lifts to apartment buildings (D048; D052; D123). In these projects, Rönkä's approach had emphasised the humane

aspect. At the time of preparing IKE, he was working as director of Future Home Institute that was known for user-centred design approach. The combination of a well tried partner and an interesting approach that was further worked together for the purpose of the project at hand resulted in partnership in innovating repair construction. (I01—02; I50; I56.)

4.2.1   Collaborative design at a design university

At the time IKE was prepared, I was working in Future Home Institute (henceforth Future Home) at the University of Art and Design Helsinki (henceforth design university; nowadays Aalto University School of Arts, Design and Architecture) as a designing researcher and was invited to join in the project preparation. Originally Future Home had been launched as a research and development project on meeting the challenges of change at the design university in 1997. The aim was to act as an enabler of collaborative development of living environment solutions by applying qualitative design research approaches. The project related to greater developments in society including building the new district Arabianranta in Helsinki, European Capital of Culture 2000 Helsinki project, and the Helsinki city's 450th anniversary. (D132.)

Later on Future Home became a research group that expanded its research and development tasks to tens of projects involving research, design and development of dwelling and working in the living environment until it was renamed to Living Places research group in the beginning of 2012. At the time of preparation and running IKE other ongoing projects were "ASTAT" to develop user-driven technical building services and systems, "TSA" to study future senior housing requirements, "Living trends" to study housing trends and phenomena from the consumer point of view, "Common Ground" to explore living logistics and neighbourhood integration in Arabianranta district, "Intel Cities" to enable electronic and mobile participation in city planning and management, "Active @ Work" to develop individual ways to promote ageing workers' conditions, "Smart Store II" to create a retail facilities and service concept for a hybrid shop utilising information technology, and "Getting a lift" to develop user-centric ways to promote the construction of lifts in existing apartment buildings that was more or less a continuation to IKE (D027; D132; D133; Mattelmäki et al. 2007; Soini & Pirinen 2005).

In all of these above mentioned and other projects at Future Home, there was strong emphasis on collaboration to incorporate stakeholder aspects including businesses, users and the public sector in the research, development and design work. Collaboration was actualised through an intensive collective process where several workshops were organised to create shared visions and build commitment to enable continuous development beyond projects (Soini & Pirinen 2005).

The target-oriented involvement in the projects tried to ensure that new ideas would actually diffuse to partner organisations and their practices.

> "My main task is to make sure in these projects that the customer and user orientation is properly understood, and it will not be run over with the aspects of business. It is important to highlight that we are not necessarily only involved in terms of research. Research at the design university is qualitative in nature, and when you set it against the quantitative business figures, the importance of qualitative research becomes easily wore off in firms. [My main task is to] highlight this kind of an issue: for what and how should be the qualitative data used in business." (Professor Jarmo Suominen, I53.)

> "We strive for close involvement with the partner companies within the progression of the project, so that the new knowledge is immediately available for them to be applied in practice, instead of publishing a report few years later in the end of the project that probably none of them would have time to read so carefully anymore at that point." (Researcher Susanne Jacobson, I46.)

These quotes tell about collaboration that involves careful listening to the partners of research in a similar manner to consulting that contributes to a design discourse with their interpretation on a subject provided by a client organisation (Verganti 2009, 117, 120, 125). The group director started his own consulting business later on, in which he described his tasks as being a questioner, knowledge transferrer, builder, user knowledge implementer and awakener at firms, which I recall being emphasised also throughout Future Home projects (I03). This kind of approach was applied to ensure that the results of research are being incorporated to organisations' actual developments, and to find meaningful research problems. Meaningful research problems were in a similar manner defined by preparing projects based on the needs in organisations, customising project processes to meet organisations' interests, and during the projects by seizing on issues that rose during encounters in workshops and other events.

Because social impact was the all-encompassing aim at Future Home, the goodness of research results was not therefore assessed based on the typical academic quality, for example according to contribution to the academic community, but the analysis and interesting conclusions needed to be capitalised in partner organisations. The research interest at Future Home was neither in methodological aspects as is typical to collaborative design in general or to develop theoretical

models but applying existing methods in a particular context. For example, extensive user studies following the empathic approach developed in the design university were used to facilitate collaboration (Koskinen et al. 2003; Mattelmäki 2006; Mattelmäki et al. 2014). These user studies at Future Home, though, had a particular focus that was different to what I was used to when being involved with concept design of products and interactive systems (e.g. Keinonen & Jääskö 2004) in that we applied the basic principles of architecture and interior architecture about place as a concept: many of the user studies were strongly located to particular places, and the idea of context was more likely a point of reference instead another factor of user experience. When exploring these contexts in places, user perspective provided a neutral and easy-to-understand ground for encounters of people from different backgrounds (Soini 2006; Soini & Pirinen 2005). This was not however developed to a theoretical framework or presented as an academic contribution. Instead, one of the indicators of successful research was that the research subject would find its continuation in a new project but with a new framing based on the learnings in the preceding project. Therefore, the criticism that participants pointed out towards research findings were taken as an opportunity to more carefully define the research problems in the following projects based on which new project drafts were created. (I03; I53.)

The knowledge capital of our research group was thus built on a collection of projects at the time of IKE. Even though during the follow-up interviews, theoretical developments started to take form through doctoral research (Heikkinen 2013; Jacobson 2014; Pirinen 2014; dissertation at hand), the emphasis on practical aspects of research knowledge permeated the culture of Future Home throughout its history. The philosophy of practical objectives were shared by the leaders of Future Home, namely director, M.Sc. Kimmo Rönkä and professor, architect Jarmo Suominen, and the personnel comprised of design researchers having backgrounds in some sort of planning or designing (degrees in industrial design, interior architecture, architecture, and engineering). The skills we shared included user study, concept design, housing research, accessibility studies, and mass customisation that were applied in different mixtures in projects. (I03; I09; I45—46; I53.)

What was common with the Future Home personnel was that none of us were experts in repair construction or many other subjects we got involved with. The common denominator was to apply design as the universal skill that can be applied in any field (Buchanan 1992). Despite the universal scope, personally the leap from user studies, methodical development and concept design in regard to industrially manufactured products to designing complex worlds felt quite long. To build a bridge between these worlds of tangible products and complex systems, I applied my professional experience. Firstly, I applied the empathic and

participatory design approaches that allowed me to go about researching the phenomenon in an open way. It allowed me to be as holistic and unprofessional as users. In other words, empathy and participation gave us a lens that we took as our tool to handle the issue at hand. Secondly, industrial design education had taught me to think about large series of production. Housing stock, for example, is comprised of apartment buildings that are just another, yet massive, set of products. Even though we did not consider the industrial process, the perspective helped me to grasp the challenge through physical products. Thirdly, I counted on the project team that always comprised in addition to us design researchers also representatives of partner organisations. These people were experts of the subject at hand that by being directly involved to the process helped us to perceive the bigger picture.

Taking a particular perspective was not only our tactics but also our common way to handle the complexity of the real world. The perspective was typically selected from the point of view of users within their everyday contexts, following loosely the design for all and empathic design approaches.

> "I used to be accessibility researcher at the Technical Research Centre of Finland, later on a consultant, and then at the design university. At the university people were not interested in accessibility because it is boring, and I realised it is not worth pursuing. Then I realised, that this 'user' thing works. So, not 'design for all', but 'design for me': apartments should resonate with people, each with their own way." (Research director Kimmo Rönkä, I03.)

Following the idea of "designing for me", Rönkä (I03) stated that choosing a perspective was a way of being creative at Future Home because it gave us the possibility to look at ordinary things anew. Rönkä thinks this act of creativity requires trading off customary perspectives and asks for intuitive exploration where the mind and the heart are being listened, similar to the story of *The Little Prince* by Antoine de Saint-Exupéry (1943) telling of encounters of the prince and a pilot. According to the story, Rönkä points out, the adult pilot gets surprised that the little prince recognises a drawing he made when he was a child. The picture was of a boa constrictor with an elephant digesting in its stomach but every adult who saw the picture would mistakenly interpret it as a drawing of a hat. The little prince explained why he recognised the drawing by saying that you should look with your heart to see the true being. Referring to the story of the little prince, Rönkä wanted to share his vision that by focusing only on intellectual analysis you cannot grow your empathy on people's situations. Being open to new perspectives

and fresh interpretations nourishes creativity, and by capitalising creativity in research we may discover new vistas for a wicked problem.

4.2.2 The role of collaborative design in problem-definition

Taking a new perspective became the foundation of the IKE project preparation. Uniting technical and social aspects of renovation was the basic idea in preparing the project that started to alter the overall perspective towards repair construction that had been formerly seen as a techno-economic professional activity. Forming IKE was the first step in problem-definition that run through the project and was eventually finalised in the final report that presented the development requirements for repair construction (P92, 61—72).

This takes us back to the beginning of this chapter where reframing the planning practice in USA in the 1970s was paralleled with the need to develop repair construction in Finland in the new millennium. The result of reframing planning ended with the famous conceptualisation of "planning problems are wicked problems" (Rittel & Webber 1973, 160) incorporating the ideas of openness, relativity and continuous change. The actual challenge of a wicked problem is its formulation: "one of the most intractable problems is that of defining problems (of knowing what distinguishes an observed condition from desired condition) and of locating problems (finding where in the complex causal networks the trouble really lies)." They continue that "[i]n turn, an equally intractable, is the problem of identifying the actions that might effectively narrow the gap between what-is and what-ought-to-be." (Rittel and Webber 1973, 159.) Choosing to focus on the socio-technical perspective at repair construction profoundly opened considerations for this kind of a wicked problem. Repair construction could not be seen purely as a technical act anymore but seemed to embody far more diverse dimensions. The socio-technical combination was a new perspective for repair construction professionals, for which collaborative design was invited to offer the means.

One of the basic aspects in the IKE preparation was that research and development on repair construction was divided in distinct phases. I remember the project plan suggested initially quite a direct development without proper research first, in which I saw a potential threat in regard to careful problem-definition. With the ISO 13407 (1999) standard for human centred design processes for interactive systems, I argued for the project preparation group the importance of understanding the problem and finding the right question to guide the development efforts to a fertile direction (I03). This would spare from wasting resources because funding and resources would be allocated according to the best possible way in a complicated and partly-open ended process that was about to involve many different stakeholders, and also eventually speed-up progress of repair construction.

The ISO standard emphasises continuous development in an iterative process that comprises of five steps involving user study, design and evaluation. The process is supposed to be continued until requirements are met but typically it is not possible to find a definite solution for a wicked problem but considerations that the exhaustion of resources or other external considerations to the problem stops the process (Rittel & Webber 1973, 162). The standard was accepted as the basic principle in preparing IKE that was respectively defined to incorporate three iterative phases: 1) preliminary study, 2) development of the user-centred IKE process, and 3) testing the process (P03). The first ISO standard step, planning the user-centred process, was actualised during preparing the project as described through in this section. The second step, building understanding of the context of use, and the third step, specifying the requirements, then were conducted in the preliminary study through identifying the status of repair construction, especially from the resident perspective, and including analysis of the technical and population trends. The fourth ISO standard step, producing design solutions, was planned for development of the user-centred IKE process model that would consider different types of renovation, process management, decision-making, resident involvement, interactive communications and development of new required technology based on the learnings from the preliminary study. The fifth step, evaluating design against requirements and continuing iterative development, was taking place through piloting the IKE process. In this phase, as in all other phases, the special focus was in communications that would take advantage of different media such as television, press and the Internet. (ISO 13407 1999; P03.)

When we were preparing IKE, we also framed the direction where potential solutions will be found. A wicked problem cannot be detached from the reality to be explored but building understanding of the problem unavoidably frames the potential solution spaces (Rittel & Webber 1973, 161—162). Originally the framing involved studying ageing people and accessibility but it was found out during discussions that this subject had been studied often and when the discussion turned to repair construction processes, we realised that they had never been analysed. Instead we decided to focus on in-depth study of renovation process experiences, and particularly on one of the renovation types, replumbing that was seen as the most difficult renovation target in an apartment building because it enters people's homes and creates extensive distraction to normal living. The research subjects were selected to be housing companies that are the most challenging client for a renovation work. We reasoned that by selecting the most challenging client—housing companies—and the most difficult renovation target—replumbing—for the subject of IKE, we would learn more and have a robust starting point for a variety of housing renovation future developments. While focusing on replumbing processes from the resident perspective, it became even

more obvious that the issue actually resonated with all age groups and the more inclusive approach, instead of focusing only to the accessibility, seemed appropriate in creating a basis for future developments. (I01—03; I50; I56; P01; P04.)

With applying empathic design ideology, the problem started to involve building rapport with residents and their renovation experiences in a holistic manner where the point of reference would be residents' everyday life, instead of considerations of physical alternatives for accessibility. This approach we offered for the IKE preliminary study was very new to the professionals repair construction because it involved a qualitative method exploring the everyday of a small group of informants, and it included creative tools and explorative workshops, but it supported the basic socio-technical idea and offered the needed fresh approach. (I01—03; I50.) Focus on user experience related to the design zeitgeist of the 2000s, but I think that in other eras some other approaches could do the trick as long as it helps to choose a shared point of reference. For example, if the project would have started in the 2010s, the approach would have more likely related to service design that offers an elaborate approach for specific research of service processes, including the service ecology and the customer journey comprising of service moments and touch points (e.g. Sundbo & Toivonen 2011).

In addition to framing the objective to deal with empathic understanding of residents' renovation experiences and the method as an iterative development process, collaborative design approach also helped to find new vocabulary for socio-technically oriented repair construction. The new vocabulary included basic concepts such as *user* that I defined in the housing company renovation context to be a dweller, a shareholder, an investor, and a tenant representing the real end user who does not necessarily is the client following the basic user-centred design terminology (Keinonen & Jääskö 2004; P07, 3), and *life cycles* comprising of experiences, current situation and anticipated needs following the idea of user experience as a spark of a moment (Sanders 2001; P07, 9). Additionally, new vocabulary was created to crystallise the project agenda. Kimmo Rönkä raised the issue in the last moments of preparing the project and the original project name *Life Cycle of People and Buildings* was changed to *Living Cycles of People and Buildings* to emphasise the complexity of the issue (P05). Rönkä argued in a project group meeting that the life cycle means that there is a turning point in a pre-determined time after which the apartment building would not have hope for better times but would inevitably deteriorate. Instead, the suggestion of living cycles wished to highlight multiple cycles in life having many new beginnings with new hope and opportunity: "cycles give pulse to life" (I03). It verbalised the positive expectation of renovations and better lives, and allowed people to dream for the better future that the project planning group was dreaming about. The idea was

welcomed, and Rönkä was pleased about the explorative atmosphere in the project meeting and the unusual readiness of repair construction professionals to seize new ideas. (I03.)

Collaborative design with its focus on users' everyday world thus offered for IKE preparation a more robust perspective to locate and define problems, and to find means to build a bridge between what-is and what-ought-to-be based on user orientation in design. For collaborative design, preparing IKE was the window for Future Home to immerse in the complex world of repair construction, and to start building its sense of ownership in user-oriented repair construction.

5. Collaborative Design in the IKE Project

The three year research and development project on user-centred repair construction processes was planned to be conducted in three phases under title *IKE—Living Cycles of People and Property*. The first phase was the preliminary study commissioned by the Ministry of the Environment to examine holistically the critical points and best practices relating to renovation of residential apartment buildings in Finland, especially from the previously trivialised perspective of residents.

"The aim is to analyse the existing repair construction processes from the perspectives of those, especially from residents, who are involved. The IKE preliminary study builds an experience-based overview of current practices by identifying the various stages of the process, the bottlenecks and successful work practices.

THIS STUDY HAS FOUR COMPONENTS:

1. Assessment of repair and modernisation needs of apartment buildings

2. Residents' needs and experiences in modernisation projects

3. Project follow-through, process management and technologies in modernisation projects

4. Communication and interaction in modernisation projects" (P92, 7.)

The main outcome of the preliminary study that is here called *IKE* was the vision of resident-oriented modernisation for Finnish repair construction, which opened a new opportunity window for improving professional practices by considering residents as equal partners in developing the living environment during renovation.

IKE was a preliminary study that evoked hope among professionals who were concerned about the situation at repair construction. IKE served its purpose as a preliminary study to activate development on a societal issue through focusing to residents' renovation experiences in a reflective process that was, moreover, timely. Perceiving the challenges and opportunities of repair construction was becoming more common, and the expectations toward the ministry and other core organisations to announce their opinion on dealing with the topical societal issue of repair construction was growing.

The user-oriented collaborative design approach was introduced to the field just in time when radical changes were needed. The preliminary study was reflection between everyday and society that actualised through a unique combination of the collaborative design approach emphasising empathy, participation, collective creation and envisioning of new futures, and awareness of the challenges and opportunities for repair construction. (I01—02; I04; I47.) It was reflection in the way Donald Schön (1983, 302) presents: stakeholders joined in collectively making sense about repair construction instead of just counting on the research partner. Collaborative design acted here as the professional discipline that helped to grasp the complex world of repair construction from a fresh perspective. The sense-making was actualised through the involvement and action of 67 people representing different relations to repair construction.

Practically, the preliminary study took advantage of the ideas of collaborative design in a project process that was comprised roughly of three phases: opening, user study and workshops, and closing (Fig. 5.1), in which user study and related workshops built a backbone for the whole preliminary study (P03—04). After getting quickly through the usual project launch activities such as completing the project organisation, preparing a press release (P97), and agreeing upon the detailed schedule in the first phase *project launch* (P04—05; P50), we immediately entered into practical actions in the second phase *user study and workshops* that took over half of the project running time. During the ensuing months, design research tasks were organised in consecutive phases of contextual interviews, focus groups, design probes, and user experience workshops that were conducted in three different housing companies in parallel, and a synthesis workshop (P04, 4; P07, 11; P13, 6—19; P15, 2). Throughout the process there was intensive reflection of the recent findings in the user study with topical issues that affected repair construction and the affluent society in large.

The final phase of the preliminary study, *closing*, started three weeks after IKE had reached its middle point. At that time, the aim was to finish the project within six weeks and to publish the report within

FIGURE 5.1
The IKE project comprised of three main phases: project launch, user study and workshops, and closing. The project group and steering group meetings were organised frequently to support the project process. Publicity and public discussion was highlighted in IKE.
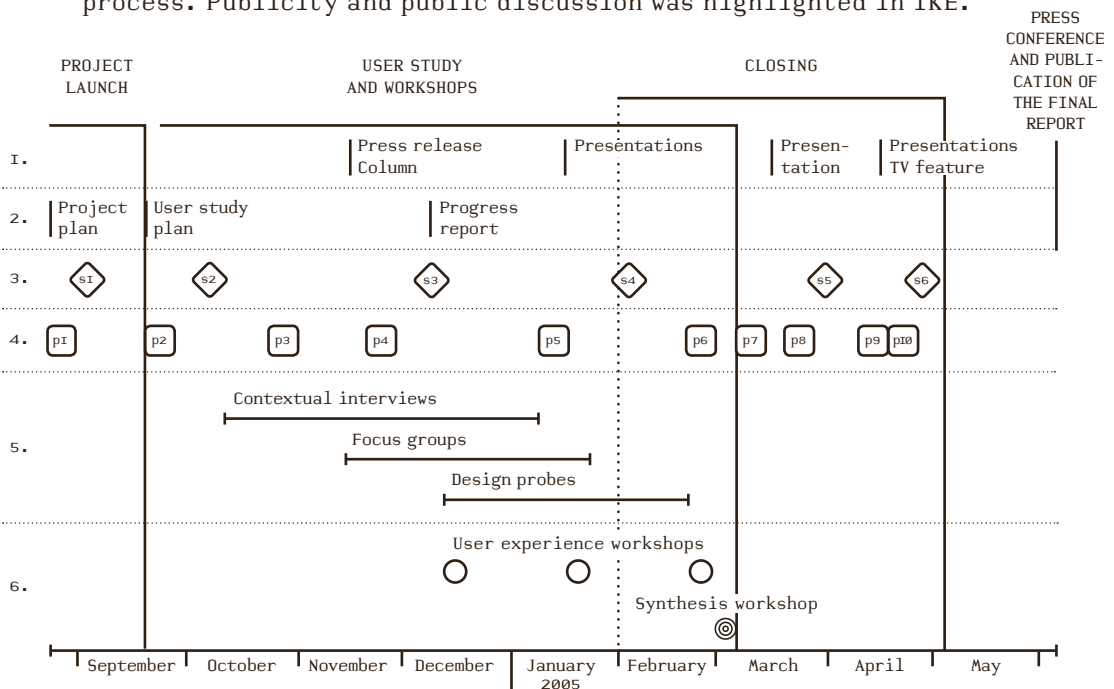
1. Publicity
2. Plans and outcomes
3. Steering group meetings
4. Project group meetings
5. User study
6. Workshops

three months (by March), but the schedule was postponed because the subject at hand was found to be more complicated than was expected and finalising the message for the report needed more time than planned. Therefore, instead of the official time framing for the preliminary study that was set by the ministry between September 2004 and March 2005 (P04, 5), the project group was actively involved to execute the set objectives for 41 weeks between August 2004 and June 2005 (P04; P11; P33; P66; P71; P84; P89—91). The project ended in June 2005 when the final report was published in a media event organised by the ministry (P89—92).

5.1 GROWING NETWORK OF CONTRIBUTIONS

There were many sorts of contributions involved in making IKE happen within the 41-week-long project. Altogether 50 participants beyond the project organisation were invited to get involved in the user study and workshops to share ideas and to define collectively the development requirements for repair construction. Design researchers brought in residents' experiences to evoke empathic understand and to offer a mutual discussion platform. They also reified the project outcomes for later use with other project group members. Professionals working in government, trusteeship and business linked the project work to their everyday work life. Communications professionals told about the findings in media and edited the preliminary study findings in the form of the final report. Everybody were involved in the mutual learning process by bringing in their differing expertise. IKE was thus a platform for various stakeholders from the repair construction system to join in and prepare themselves for the future of repair construction.

The official partnerships in the IKE preliminary study were settled between the ministry, Vahanen, Image Builder, and Future Home. This kind of multidisciplinary collaboration was written in the research plan to get a holistic understanding of the status of repair construction in Finland. The preliminary study was conducted collectively to examine the status of repair construction from different perspectives.

1. Future Home Institute at the design university focused on studying and sharing residents' renovation experiences and needs as the point of reference to the preliminary study,

2. Vahanen Oy as a leading engineering consultancy surveyed the nationwide need for apartment building technical repairs, and the status of the housing renovation processes and technical management, and

3.   Image Builder Oy examined communication and interaction relating to apartment building renovation and modernisation, while

4.   the Ministry of the Environment commissioned, funded and steered the preliminary study (P03).

Five people from Vahanen, Image Builder and Future Home formed the core team in that they were members both in the project group and in the steering group as is presented in figure 5.2 (P09). Three of them initiated the project, including the director of the project, chairman of the board at the engineering company Vahanen, Risto Vahanen who is a reputed actor in repair construction. Two other core team members who were involved in initiating IKE were communications professionals from Image Builder Oy. Juha Salmi is a public figure having an extensive experience on media, for example by producing a TV-program and an annual executive seminar on housing markets, and Jouko Taskinen as his partner (D033). Taskinen was secretary of both groups in IKE, which he saw as a focal position to facilitate the project in collaboration with chair (I56).

Two more core team members were design researchers working at Future Home. Director Kimmo Rönkä had long experience on research in housing domain and had the best understanding on the issues at hand of the design researchers (D048; D052; D123). I was project manager (Katja Virtanen at the time) and responsible of the practical research work focusing on residents' experiences, and now the author of this thesis (A in Fig. 5.2). By having membership in both groups, the core group was able to channel insights in both directions: to share findings from the research work and to instantly focus their following activities based on the discussions and decisions in the steering group meetings. All of them had been involved in preparing the project and had affected the content and focus of IKE, as has been already described in previous chapter.

Steering group is a focal activity in these kinds of preliminary studies that the ministry commissions because they represent the parties that are considered to have an impact to the issue in society (I04; I08; I47; I63). In addition to framing the project objectives, discussions in the steering group were most of the time linked to ongoing practical work in regard to user study and workshops or considerations on dissemination of results. The steering group had officially ten members (one of them being substitute) from five different governmental units, business perspective, communications and design research (P08—09, P62). Additionally during the process there were three more attendees representing the ministry and the Housing Finance and Information Centre of Finland who involved preparation of the preliminary study or provided expert opinions (I50—51; I62). One of them lived in an apartment building that was having a replumbing project at the time, from where she brought personal experiences and insights into discussions;

PROJECT AND STEERING GROUP MEMBERS · INFORMANTS · INVITED PARTICIPANTS
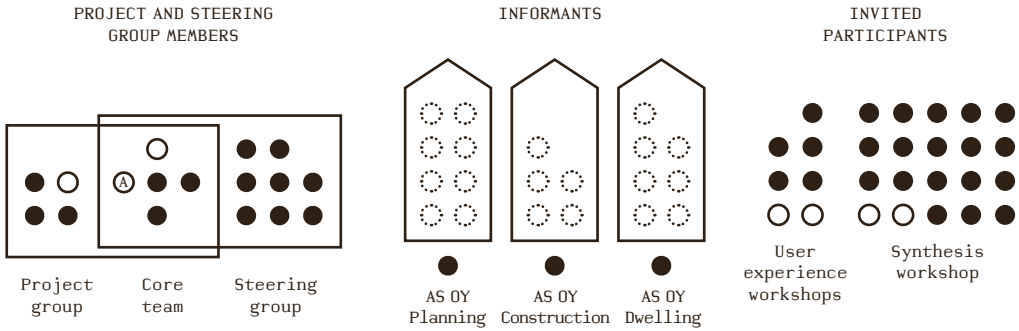
FIGURE 5.2

Participants according to their roles in IKE. Dashed circles indicate residents, black circles renovation professionals and white circles design researchers. Author is marked with letter A.

for example, by emphasising the financial aspect that eventually defines what will be done in the housing companies (I62). CEO Ukko Laurila from the Finnish Real Estate Federation was invited to be the chair of the steering group to represent the federation that is the central association of property owners and landlords in Finland, and as such the institutional representative of residents who were about to face housing renovations financially and in their home environments (D108). Erkki Laitinen, building counsellor at the ministry, was the vice chair. He was also chair of the working group at the ministry that had recently started its work to form a national strategy for repair construction, and had thus the opportunity to influence societal decision-makers directly (D065).

The function of a project group in a preliminary study then is to execute the assigned research work based on the best possible knowledge. In IKE, the project group from four multidisciplinary organisations was comprised of five members in the core group and four more members to provide work force at desired perspectives (P11; P22). From Future Home there was also a third person, Riikka Rahtola, who was involved as the research assistant. Two engineers from Vahanen and CEO of their partnering engineering organisation Kiinteistön tuottoanalyysit Oy brought in expertise on engineering, contracting and construction work as they were closely involved in housing renovations and process management in their everyday work life. These partners met regularly to work out objectives, to discuss findings, and to interpret material in a form that could be communicated to people beyond the project group. The group also analysed the vast amount of material generated in the project and documented the findings in the final report (P92). (I01—04; I47; I56; I61—63.)

The project group and steering group meetings were organised frequently to support the project process along with the activities at the user study and the workshops (Fig. 5.1). There were altogether ten project group meetings and six steering group meetings to intentionally knot

together separate practical actions and phases of IKE. The steering group meetings were said to have been held more often than in typical preliminary studies. As it is typical in preliminary studies commissioned by the ministry, the principal division of roles was the following: the project group did the practical project work while the steering group guided that according to the societal circumstances, governmental objectives, and to meet the common good. The project group meetings were organised to plan practical actions during the process, to share and analyse research findings, to get prepared for the steering group meetings, and to finalise the preliminary study into the form of the final report. Repair construction professionals of the project group were particularly motivated to find justification for long-term, meaningful and systematic renovation instead of the unorganised prevailing practice. The steering group meetings were then organised to assure that the objectives were being met and practical actions were refocused whenever needed to meet the overall objectives relative to the ongoing work in the ministry and other instances. During the process, members got inspired from residents' renovation experiences, which provoked enthusiastic discussions on practices and structures determining repair construction. One of the most discussed issues was the Finnish limited liability housing company system that seemed to make the decision-processes in renovation complicated, and how it should be developed to simplify processes. (I01—04; I47; I56; I61—63.)

This kind of collaboration that involves different stakeholders from society is rather typical in regard to preliminary studies commissioned by the ministry or other public research and development in Finland.

> "That is the good thing about the Finnish working groups that the idea of public-private partnership has gone through. There are ministries and representatives of the various parties trying together to find solutions. It is not about political pressure and lobbying, but joint development of ideas; lobbying happens within government. It is the strength of the Finnish society that we can work this way." (CEO Ukko Laurila, I47.)

It is quite typical that public and private parties work together to find real societal questions and solutions together in Finland (e.g. D070). Even though this kind of mixture of different stakeholders was not unique, in IKE the idea of multidisciplinary work was taken a step further with practical activities based on collaborative design methods that are described in the following. Additionally to the commissioned tasks for project and steering groups, the network of individuals and organisations who contributed in IKE grew throughout the project process. In the end, the network included 67 individuals from 30 organisations representing housing companies, construction, renovation and engineering business, communications, governmental and city organisations, NGOs, real estate

management, manufacturing, and research and educational institutes.
I recall that our aim behind involving a large variety of representatives
from repair construction, was at building shared empathic understanding
of residents' experiences and synchronising visions for the field among
different stakeholders that would in our thinking vertically comprise the
renovation practice. This way we instinctively tackled a challenge that has
been identified in more recent literature (Buur & Matthews 2008): as the
outcomes of the project were collectively produced among those people
who were seen to be the implementers of change at repair construction,
there did not brew up a gap between creation, adoption and implementa-
tion of the innovation. On the contrary, by contributing to the outcome,
many project participants became committed to implementing change, as
is illustrated in the following chapters.

5.2 USER STUDY ABOUT RESIDENTS' RENOVATION EXPERIENCES

Residents' world was explored in an extensive user study, which design
researchers conducted in three housing companies. The replumbing pro-
jects in the three studied housing companies were in different phases to
cover residents' experiences at the very moment and in situ (P07; P16—17;
P92, 13—14). The housing companies were studied in the reverse order to
the real world sequence of events to move about from a holistic picture
of an entire renovation process to explore the details in the beginning
of the renovation process. The order enabled us to share learnings from
the housing companies that were further in the process from the others.
The retrospective reflection also let professionals revisit earlier work in a
more holistic manner.

First, we entered to As Oy Dwelling that had finished their
renovation a year earlier and had experienced the whole process from
preparation and planning to execution of a replumbing project. The
housing company had finished its plumbing and HPACE renovation, and
also renewal of the courtyard paving. Professional experts had led their
preparatory and planning phases in a systematic manner but the initial
serenity turned into doubt and fears as the contractor turned out to
be unreliable and inflexible. Difficulties during execution scarred some
residents for a long time. Despite the difficulties, the end result quality
and final costs were pleasing to residents. (P92, 35—38.)

Secondly, at As Oy Construction, we learned about the most
tangible phase as the construction work including demolition work,
building and installation work are executed in their premise to actualise
the plans. The apartment building was amid the execution of HPACE,
bathroom and shared spaces repairs. The preparation and planning phases
had been characterised by friction and rivalry. Residents told that a few
older residents' life situation would not have allowed a heavy renovation
and their resistance slowed down the process. Due to technical reasons,

USER STUDY – REPEATED SEPARATELY IN THREE HOUSING COMPANIES				SYNTHESIS WORKSHOP
CONTEXTUAL INTERVIEWS	FOCUS GROUPS	DESIGN PROBES	USER EXPERIENCE WORKSHOPS	
Background information of the housing company and basic information of its renovation project	Collective experiences and expectations for the housing company and its renovation process	Self documentation on dwelling histories and dreams and experiences of renovation process	Sharing residents' insights from the probes study and exploring the user experience of renovation process	Sharing preliminary study findings and gathering development proposals for repair construction

FIGURE 5.3
User study and workshops. Dashed circles indicate residents, black circles renovation professionals and white circles design researchers. Author is marked with letter A.

however, the majority of residents wished to enter renovation. At the time of user study and workshops of IKE, the construction phase was running well, thanks to a flexible and well-qualified contractor. (P92, 28—32.)

Thirdly, we got to know As Oy Planning that was in the first stage of an official renovation project where professional renovators are being hired to work for the company. By early 2005, the housing company had had a long preparation phase before a pipeline leak that had led to an acute partial repair that was now planned to follow by a larger replumbing project covering the whole apartment building. Initially the board prepared a holistic project to lump together also repair of the building envelope, but residents started to feel the project would become too heavy, both financially and emotionally, and eventually they supported only replumbing. (P92, 22—25.)

Altogether, 20 residents attended the user study from 139 apartments in these three apartment buildings (14% representation). We did not get as many contributions as we planned because we did not find more people from the three housing companies who would be interested even though we used several recruiting methods including general invitation, personal invitations, recommendations, and the process was planned so that it would help in recruiting participants for the following phases. The amount of informants was discussed and was not eventually regarded a problem as qualitative methods are typically used for studying

a relatively small group of people. According to Hugh Beyer and Karen Holtzblatt (1998), six people from each group of users is a sufficient sample even to study complex systems. With its five representatives, As Oy Construction was the only one below the eligible six representatives, which we tried to compensate by compiling rich experiential stories.

The three housing companies were studied with a similar set of user study activities. The set comprised of contextual interviews, focus groups, probes study and user experience workshop, and was conducted during roughly a two-month-long process in each three housing companies (Fig. 5.3, Table 5.1). The basic idea of this user study process followed learnings from a previous project, Mass.Be, which was conducted at Future Home recently and had aimed at holistic examination of user experience in order to co-create a mass customisation model for enabling work-life balance of mobile workers (Soini & Pirinen 2005). The Mass.Be process included thematic interviews to create an overall impression of mobile work, focus groups to understand the working communities' particular viewpoints, probes study to get access to personal experiences, and a series of workshops to interpret the user material and to co-create new futures. In IKE, we applied practical learnings from the project Mass.Be to similarly streamline the process of material gathering, collective interpretation and dissemination of outcomes, but the content of the user study and the form of the tools in IKE were re-designed. Similar to innovative methods that are created to fit the particular purpose (Hanington 2003), re-design ensured that the study would serve the needs of the particular context where residents and professionals had great differences in their roles and responsibilities, which had not been an issue among knowledge workers studied in Mass.Be (I03). Moreover, the user study was contextualised within the long continuum of housing to explore the original idea of living cycles of people and buildings according to which people grow old and buildings need repairs in parallel. This approach followed Sanders' ideas on accessing people's experiences through applying a three-level framework of *say* to study of the explicit issues that can be discussed, *do* to study observable ways of using and acting, and *make* to study tacit and latent feelings and dreams that cannot be directly explicated but need convivial tools to be explored with creative make-tools (Sanders 2001; Sanders & Dandavate 1999).

5.2.1 Getting to know the apartment buildings in contextual interviews

In the first user study phase, *contextual interviews*, I gathered background information about the housing companies through thematic interviews and observing (Beyer & Holtzblatt 1998; Sanders & Dandavate 1999; P15). The interviewees, a housing company manager and a representative of the housing company board, were asked to tell about the

	CONTEXTUAL INTERVIEWS (Beyer & Holtzblatt 1998)	FOCUS GROUPS (Morgan 1996)	DESIGN PROBES (Mattelmäki 2006)
AIM	To gather background information of the studied housing companies To gather basic information of the replumbing projects	To explore collective experiences and expectations on the housing company real estate management To outline the renovation project process from the experiential aspect	To reflect on resident's individual dwelling histories and dreams of dwelling To explore individual experiences of renovation process
INFORMANTS (TOTAL)	3 buildings managers and 3 housing company board members	15 shareholders and investor residents	8 residents
STUDY UNIT	Housing company	Resident community	Individual residents
TOOLS AND PROPS	Presentation on the estimation of upcoming renovations of housing companies	Star boards for assessment Timeline of the renovation process Layout of the real estate and Playmobil dolls	Assignment: Experience cards for daily thematic documentation Assignment: Home album to fill in the dwelling history Assignment: Collage to present the secret of good dwelling Assignments were packed with instructions, stickers, disposable cameras and stationery in the My home -toolbox
PROCESS	1. INTRODUCTION Presentation of the IKE project and estimation of upcoming renovation; and interviewee's background information 2. INTERVIEW Apartment building history, the structure of the occupants and the housing company board, the prevalent spirit at and the image of the housing company, maintenance and renovation history and process of the studied renovation project 3. HOUSE TOUR Half of the interviews were conducted at interviewees' homes, which was followed with a tour at the premises to get an overview of the activities in the housing company	1. INTRODUCTION Presentation of IKE preliminary study and the objectives for the focus group 2. HOUSING COMPANY residents assessed their housing company by giving one to five stars, additionally discussion on memories, and pros and cons of the resident community 3. RENOVATION PROJECT the renovation process from the resident point of view was compiled on the timeline that was precompleted with information from the contextual interviews, additionally discussion on the emotions the process evoked and impacts to everyday life; some situations were played out with Playmobil dolls 4. FUTURE Expectations for dwelling and real estate development after the replumbing	1. DELIVERY Design researcher visited residents homes and handed over the probes packages with description of the assignments 2. SELF-DOCUMENTATION Residents had two weeks to fill in the assignments; different assignments were designed so that they can be completed separately but that together they helped residents to reflect on dwelling and renovation, and to form their personal insight on the subject 3. RETURN BY MAIL 4. INTERPRETATION took place at the user experience workshops
OUTCOMES	Background information on the studied housing companies The official description of the renovation process Photos from the house tours Research questions for the following user study	Experiential assessment of the housing company Residents' positive and negative experiences of the replumbing process Hopes for the future real estate development	Experience cards documenting replumbing experiences (photos and text) Home albums telling about residents' dwelling histories since their childhood Collages of the secret of good dwelling

TABLE 5.1
Summary of the user study that was conducted
in three housing companies in parallel.

apartment building history, current situation and development plans to create a neutral picture of the situation to be later studied from the emotional perspective. In addition to these interviews, I was given a tour around the premise to discuss contextually about plans and solutions (Fig. 5.4). With these formal representatives of the housing company, we also made agreements for the user study material and sharing the information in regard to the housing company to avoid additional disagreements that often disturb housing renovations, sometimes even ending up to district court. To promote a good partnership further, we agreed on the practical arrangements on the different user study phases and practices for informing the residents. (P04; P07; P13—15; P18; P21; P24—27; P45; P51; P63.)

Contextual interviews shed light to the premises of a renovation project and built understanding, for example, about the difficulty of decision-making at a housing company. We started to see how difficult the process is already before repair construction professionals enter the apartment building: at As Oy Planning, it took as much as 14 years before the professional renovation project planning was started. According to the story told by both the building manager and the chair, a former chair of the housing company board had anticipated the renovation and moved out from the apartment building to flee their replumbing already in 1990. Nothing was however done before the housing company was overtaken by a pipeline leak in the late summer of 2001, when a resident noticed that water was running out from a power socket in his living room. What the former chair had anticipated, actually happened when the corroded water pipes led to an acute and expensive repair. Year later the Annual General Meeting (D095) authorised the housing company board to prepare a holistic renovation project covering both pipeline and building envelope renovations. Despite the decision, the preparation was prolonged because the board members' and the building manager's exhaustion over the emergency renovation and their lack of time due to other commitments. Two years passed by before the next phase was initiated in 2004. (P67; P83; P92, 23—25.)

Conveying the basic understanding of the studied housing companies and the stories was my responsibility as I solely conducted the contextual interviews. I shared notes from contextual interviews, and first impressions with project and steering group members, and also some of the insights in a presentation at an annual seminar for housing market (P21; P33; P45; P48; P51; P60; P63). With this background information we were able together create ideas for further interaction with the residents.

Two years later when being interviewed in 2007, the building managers did not have a clear memory of the contextual interviews because they felt it had neither affected their work nor the ongoing renovation projects in the housing companies. The interviewed housing

FIGURE 5.4
Snapshots from the house tour during the contextual interview at
As Oy Construction (1). The old bathrooms are completely replaced
along with the HPACE system (2). Work in progress (3). Residents had
the opportunity to choose tiles for their new bathrooms from a set
of options presented in the basement (4). (P27, 7, 23, 44, 54.)

company board members instead even recalled questions and issues that we discussed two years back. The style of the interviews had been casual and informal, which had allowed people to talk freely. One of the housing board members got afraid that she had caused more trouble by talking too freely in a situation when there was already friction at the housing company (I14). We tried to avoid friction and be sensitive, for example, by not releasing our sources. To my knowledge, we had not caused any trouble. However, contextual interviews gave an overview of the activities and plans in the apartment buildings, which helped us in discussions with other residents later on, and in formulating stimulating questions in the focus groups. (I14; I19; I22; I27; I38; I41.)

5.2.2 Exploring the resident community views in focus groups

In the second phase, all the residents dwelling in and owning shares from the housing company were invited to a *focus group* where the objective was to discuss how the community experienced the dwelling quality in their apartment building and the renovation process, and what where their expectations of dwelling after the renovation project would be ready. Altogether, we had 14 participants in the focus groups, six from As Oy Dwelling, three from As Oy Construction, and five from As Oy Planning of whom majority were long-term residents who were used to watch out for their home building. Me and research assistant Riikka Rahtola followed the traditional focus group facilitation methods to create a discussion-inducing group dynamics and also introduced design-oriented props such as Playmobil dolls to act out the most interesting social situations concerning renovation in the housing company such as presented in figure 5.5 (Mattelmäki 2003; Morgan 1996). (P04; P07; P13—14; P19; P23; P29; P31; P47; P57; P42—43; P54; P56; P67; P69.)

Playmobil dolls were used, for example, to illustrate and discuss a situation in renovated bathroom (Fig. 5.5). Residents told about an elderly resident who had lived in the same apartment at As Oy Dwelling for almost half a century and was very much accustomed to its features and proportions. Once the plumbing and bathroom renovation was finished, she had trouble with the floor heating. It seemed malfunctioning and the floor was constantly cold. A friendly neighbour visited by and adjusted the thermostat to an optimal level. Few days later the floor was cold again and the neighbour came to the lady's rescue. After a couple of such visits, they realised together that the lady had been turning off the thermostat over and over because it was in the same spot as the previous light switch with a similar operating system had been. The lady's half a century long patterns had been interfered with, and even though this was not a matter of life and death, it affected her total experience concerning
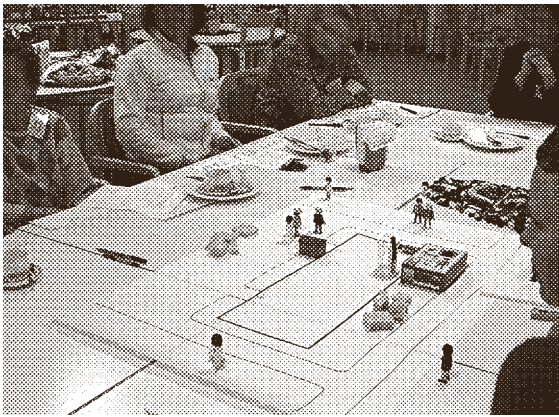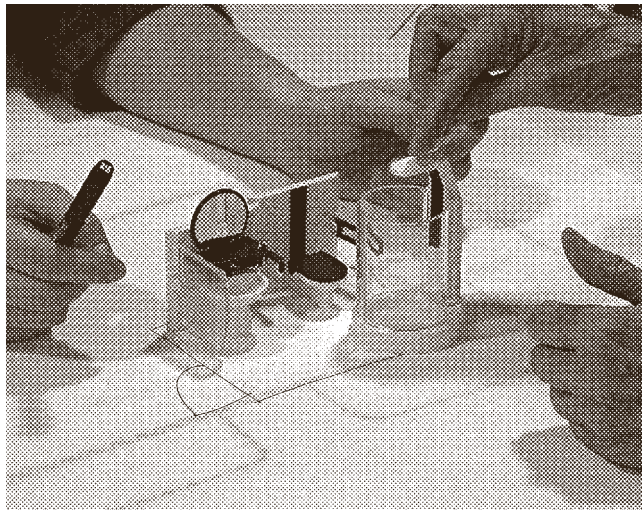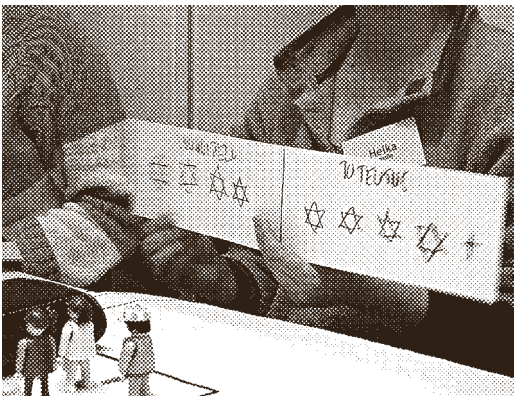
FIGURE 5.5

Focus group activities. The group is interested in someone taking the floor (1). Research assistant making notes from the discussion on a timeline board (2). Acting out a situation where there was an interaction problem while planning (3). Assessing the renovation project with stars (4). (P31, 4, 12; P47, 20, 22.)

replumbing. Other residents shared similar practical aspects that could have been better thought already before renovation. (P72; P92, 39.)

When being asked two years later in 2007, residents still remembered the atmosphere of the focus groups where an outsider came and asked questions and they had the opportunity to share their thoughts on housing and renovation without a fear of dispute or stigmatising.

> "The best offering was that [the focus group] was organised by a third party. All parties representing residents from our housing company, maybe someone also from the board, kept the conversation matter-of-fact. At the Annual General Meetings, it tends to turn to quibbling or even lead to inappropriate remarks when you are with your own people. It was a very good thing that an outsider came to ask and discuss exactly the same things, and people were able to talk matter-of-factly and even have a profound conversation. It left me a positive memory. This kind of forum could be useful also beyond research purposes." (Dweller, shareholder, I20.)

Interviewees appreciated the matter-of-factly atmosphere in the focus groups that they would have wanted to see also in the Annual General Meetings. Focus group was an event where people had a proper opportunity to talk about their important issues without emotional excesses. According to my memory, we design researchers had not considered the matter-of-factly aspect. We more likely tried to create an open atmosphere in the focus groups to talk whatever issues seemed interesting in relation to housing renovation experiences. However, everybody did not find the conversations useful or feel free to share their experiences. For example, one of the interviewees told she had refrained from telling about her experiences on their replumbing project during the focus group because she "didn't want to falsify the research" with her personal experiences (I15). The renovation project was just recently finished and she felt her emotions were too difficult to be shared with others and she instead struggled hard to retain her composure. During the event I remember she however did unveil interestingly some of the difficulties she had faced and while being impressed by them, I invited her to attend the following probes study to have the possibility to share her experiences. She declined the invitation for the same reason of having too much an original perspective. The irony is that we looked for unique, even extreme cases to be explored in the probes study. (I10—12; I15—17; I20; I25; I28; I31—32; I35—37.)

5.2.3 Self-documenting dwelling and renovation experience with design probes

In the third *probes study* phase, we dug deeper into individual experiences by giving eight residents a self-documentation package for a couple of weeks to gather their personal experiences and views on the renovation and dwelling. The main influence for the IKE probes package came from Mattelmäki's (2003) earlier work on design probes that I had experienced first hand as her research assistant and applied in several projects and teaching (Virtanen 2005; Virtanen et al. 2004; Soini & Pirinen 2005). Design probes put the user in the centre of activities with user participation and self-documentation, look at user's personal context and perceptions, and are meant for exploration instead of finding answers (Mattelmäki 2006, 39). Additionally, the IKE probes study took inspiration from the experience sampling method that is used for studying the quality of subjective experience with contextual samples (Csikszentmihalyi & Larson 1987; Hulkko et al. 2004; Palen & Saltzman 2002). The physical probes package in IKE was called My Home toolbox to follow the renovation theme. The three main tasks aimed at allowing residents to share their views and experiences about dwelling and replumbing by taking photos that were explained in experience cards, sharing dwelling histories in the home album, and presenting the secret of good dwelling in a collage (Fig. 5.6). (P04; P07; P13—14; P32; P34—40; P42; P52—53; P65.)

The probes study is a time-consuming process, in which each phase refine and deepen understanding of the user experience to increase the feeling of empathy (Mattelmäki 2006). In IKE this process was adjusted to emphasise a collective understanding of user experience among multiple stakeholders, and to streamline the process. Reading notes from the contextual interviews and browsing summaries of the focus groups had already started tuning into the users' world that was continued in planning the objectives for probes among project and steering group members. The logistics were built into the user study process, and had started already during the focus groups where we recruited participants, counting that there would be enough time for two weeks self-documentation, returning the packages, first interpretations and preparing the material (e.g. to develop the photos) for the user experience workshop. In the user experience workshop the repair construction professionals had the opportunity to encounter the residents alive and to deepen their understanding on residents' world. (P04; P07; P13—14; P32; P34—40; P42; P52—53; P65.)

Especially in the probes study we had followed the idea from design for user experience that residents' renovations experiences are built layer by layer over time as the past experiences and future expectations influence the experience people have in the moment, and therefore
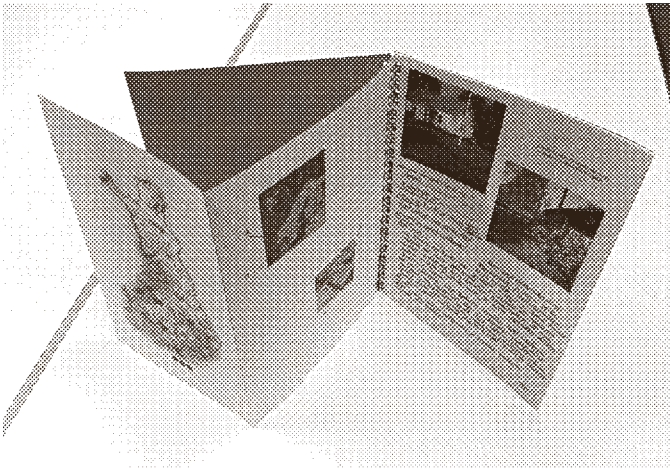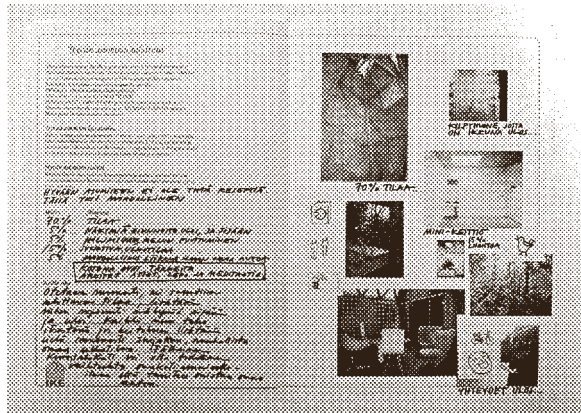
FIGURE 5.6
The probes package called My Home toolbox as it was delivered to
the residents (1). Experience cards documenting experiences and in-
sights with seven daily themes (2). The home album was for telling
about dwelling history (3). A collage to describe the secret of good
dwelling (4). (P40, 3, 7, 14, 17; 30–32.)

explored the life cycles through histories, dreams and meanings of dwelling in parallel with the progress of the renovation process in its various phases (P92, 14—16; Sanders & Dandavate 1999). An example of the dwelling histories is given by a long-term resident, Aulikki, who had worked as a clerk in the construction department that built the apartment building in 1956.

> "Born in the '30s Great Depression, my only dream
> was to have a home where we would have a tiny nook
> for my child's privacy. [...] There was a time when our
> children built Bedouin tents. Kaisa [a friend of the
> resident's child] lived upstairs and just hollered my
> daughter to play. I sent the girls out with a basket.
> Then they called that something was still missing and
> there went the basket again. We had such a nice bunch
> of kids, they agreed together and played along in the
> courtyard. Nowadays [it is too quiet because] we only
> have three small children in the house." (P70.)

Aulikki was still in the 2000s proud of her achievement to own the apartment because she originated from a poor district where her parents brought up their four children in a 22 m² single-room apartment. Her driver for dwelling was the welfare of children, which highlighted the life cycles of the apartment building from a human aspect as she told about the children in three generations.

When looking back on the project two years after its ending, project participants considered this kind of an approach to locate renovation activities within dwelling histories with a particular focus in everyday experiences a fertile tactic. Focusing on dwelling histories evoked among residents self-reflection about their dwelling preferences. One of the residents, Niilo, spent an evening talking about the issues with his friend before he filled the package. Niilo also took advantage of the probes process by thinking about his priorities and decided to hire an architect to design his bathroom to meet his personal needs (I52). Another resident, Heta, told she moved to a detached house after a while because she had started to understand how important it is for her to define her own living environment (I25). Professional project participants then appreciated residents' stories that gave an easy-to-relate-to everyday context for repair construction.

> "Everyone's housing is a long continuum. It starts
> in our childhood and today we are in a particular
> situation. It's like a chain, and you can compare in
> your mind the quality of housing to the experiences
> you have had in the past. When you wish to gather
> information from the ordinary people living in

housing companies, I think this is the way to get it
pretty naturally when they look back to their dwelling
histories." (Project manager Jouko Taskinen, I56.)

Several professionals interviewed in 2007 mentioned that "one of the
best things in IKE was resident interviews, experiences and direct
quotes" (I58). User experiences were interesting because they showed
glimpses of the reality and exemplified how renovations could be
handled in another, user-friendly, way. The stories were easy to under-
stand, and also to be used as insight for other contexts, "in contrast to
technical knowledge that is context dependent" (I60). (I01—04; I09; I20;
I25; I28; I31; I35; I37; I45—47; I49; I52; I63.)

5.3   WORKSHOPS FOR COLLABORATIVE
SHARING AND VISIONING

The user experience workshops were the last user study phase that also
started sharing insights and envisioning for repair construction among
multidisciplinary stakeholders. Altogether four workshops—three user
experience workshops and a synthesis workshop—were organised in
IKE as "events that gathered various actors to face-to-face collaboration
and challenged them to perceive anew the ordinary ways of thinking to
design for the future" (Soini & Pirinen 2005, 1). The workshops were
part of the continuation from exploring residents' renovation experi-
ences in user study, to encounter residents and their world in the flesh
in user experience workshops, to construct an array of development
requirements for repair construction in the synthesis workshop, and
to eventually generate vision for repair construction (Fig. 5.3). In the
workshops, we design researchers aimed at pulling together the user
experience and professional know-how on housing renovations by
gathering central but diverse stakeholders of repair construction to share
perspectives and to build mutual starting point for the future with the
help of design-related tools following the ideas of participatory design
(Buur & Soendergaard 2000).

While altogether 45 residents, professionals and design research-
ers attended workshops to provide their experiences and perspectives for
collective sharing and visioning, me and research assistant Riikka Rahtola
acted as middlemen who organised and facilitated workshops that are
presented in table 5.2. All workshops shared some principles that had
influence from empathic and participatory design (see also Soini 2006;
Soini & Pirinen 2005). We tried to create a trustworthy and inspiring
environment to enable encounters and to evoke empowerment (Braa
1996; Hultcrantz & Ibrahim 2002; Kraft & Bansler 1994). Trustworthy,
we believed, was needed because the usual rifts between the different
stakeholders needed to be disarmed in order to be able to look at
repair construction with fresh eyes. On the other hand, we thought

	USER EXPERIENCE WORKSHOPS (3)	SYNTHESIS WORKSHOP (1)
AIM	To explore residents' self-documentation material from the probes study To build understanding of the dwelling aspect to renovations To share insights among residents and professionals	To share preliminary study findings with larger repair construction community To gather development requirements for repair construction To induce development of resident-oriented modernisation
PEOPLE	Altogether 21 participants in three workshops: residents who did probes, IKE project members including engineers and communications professionals, engineers and architects from housing companies' replumbing projects, and design researchers from IKE and beyond	33 participants: project members and invited participants including state and city officials, representatives of trusteeship, engineers, architects, building contractors, housing firms, industrial partners, banking professionals, buildings managers, housing company board members and design researchers
SPACE	At the design university, a class room at the department of design	In studio theatre at the design university
DURATION	3 hours	6 hours
FACILITATION	Author and research assistant	Author, research assistant and project group members in group work
SCRIPT	1. Opening: Facilitator frames the evening for learning from residents' renovation experiences 2. Orientation: Residents present their probes material including stories on dwelling histories and dreams of dwelling to provide them as a context for replumbing 3. Group work: Residents clustered their experience cards from the probes package to groups of positive and negative experiences in replumbing to which other workshop participants joined in to find out together the best practices and critical points of replumbing 4. Sharing: Each group presents their findings and reflection 5. Closing: Facilitator summarises the workshop results and tells that work continues in IKE	1. Opening: Project director opens the event by presenting IKE and development trends in repair construction; facilitator asks participants to make notes in post-its to be used later on in group work to co-define development requirements for resident-oriented modernisation 2. Orientation: Presentations on the preliminary study findings about existing renovation practices in regard to residents' experiences, interaction challenges and technological challenges, and additional presentations on mass customisation and aesthetic accessibility to lay out the terrain as it was seen in IKE 2. Lunch break: Incubation 3. Group work: Participants in six thematic groups clustered their post-it notes to Gathering sets of development proposals 4. Sharing: Presenting findings and reflection 5. Closing: Work wished to be continued at repair construction
ORIENTATION MATERIAL	Probes material: Home albums and collages of secret of good dwelling	Presentations of preliminary study findings by project group members and additional presentations by design researchers
GROUP WORK MATERIAL	Probes material: Experience cards Experience board with division to positive and negative experiences	Participants' notes of the presentations Thematic board with categorisation to pros and cons, development needs, and solution ideas for different renovation project phases, and a place for summarising group work
INTERACTION	Direct dialogue between residents, repair construction professionals and design researchers in group work	One-directional sharing of findings at orientation, and direct dialogue at group work among multidisciplinary stakeholders
GROUP TASK	Prioritisation of the daily experience cards to positive and negative experiences in the experience board; following the idea of affinity diagram (Scupin 1997)	Prioritisation of the participants' insights based on presentation and documented in post-it notes to best practices, critical points, development needs and solution ideas in the thematic board
RESULTS	Prioritisation of user experience into best practices and critical points of renovation process Understanding renovation as part of dwelling Equal dialogue between residents and professionals for the first time Reciprocal empathic understanding between residents and professionals	Collective interpretation of the development requirements for repair construction New insights among multi-disciplinary stakeholders on repair construction Consensus on the need to develop repair construction towards resident-oriented modernisation Initial vision of resident-oriented modernisation

TABLE 5.2
A summary of the workshops.

that inspiration was needed to transform the encounter to an opening for a new future. At the time of the project, we did not find too much literature on workshop methods for design, especially such that would be applicable in an open-ended and explorative design research project, and we needed to create our own way of working. Similar issues have been, however, discussed in the design literature later on (e.g. Halse et al. 2010; Sanders & Stappers 2012). Inspiration was based on residents' renovation experiences documented in the user study and related workshops where new futures were rehearsed because "[i]nnovation as a process of change and learning makes it obvious that invention has to go hand in hand with rehearsing what this invention entails" (Halse et al. 2010, 180). While collectively forming the ideal vision for repair construction, learning by doing and rehearsing new futures enabled building commitment to it.

Practically we design researchers facilitated trustworthy and inspirational workshops by appreciating the local (Howard 2004), namely representatives of repair construction, as the natural persons they were who represented different equally valuable perspectives to repair construction: users were residents with their dwelling and renovation experiences, professionals represented their varying interests depending on their discipline, and design researchers brought in outsider's viewpoint. Additionally, the venue was at the design university to provide a neutral environment where laypeople and professional stakeholders with some-times contradicting agendas could have an equal position. We design researchers also provided easy-to-use tools to enable encounters through piecing experiential and professional knowledge together in an inspira-tional and tangible way (see similar Sanders 2005; Sanders & Stappers 2012; Soini 2006). Participatory tools based on the findings in the user study were used to enable dialogue in a mutual level, and to ensure that the occasionally abstract discussions would be reified to outputs that could be used in the later phases of the project process. (I03; I09; P14; P70; P72; P83)

Even though the workshops shared some principles, we pre-pared each workshop event separately. This has been later on evoked lot of discussion in design literature because careful and situation-aware preparation is seen as a key in creating synergetic and generative encoun-ters in which all stakeholders can mobilise their knowledge, expertise and competencies jointly (Halse et al. 2010, 75—77). In IKE, the user experience workshops and the synthesis workshop were both piecing experiential and professional knowledge together but the workshops had different purpose and moment in the process. Therefore realisations of these aspects were different.

5.3.1 User experience workshops for sharing and understanding experiences

The *user experience workshops* were an instrument for interpreting observations from the user study to improve understanding of residents' world. The particular aim of the user experience workshops was to collectively get "a tangible understanding of the user, her background, dwelling and experiences in renovation" (P14, 25). To enable tangible understanding, interaction among participants was organised as direct dialogue to reflect user experience among the residents, the project group, professional who were working in the replumbing projects at the studied housing companies and invited design researchers beyond IKE, and to support the building of mutual understanding among these 26 participants who attended the workshops. To promote equal interaction, I as the facilitator exaggerated residents' position in opening the event and presented them as "the kings and queens of the evening" who would have treasures with them to present (P70). I invited the professionals to join them and challenged them to use residents' remarks as an opportunity to reflect their professional practice and to become better in their work through learning about residents dwelling histories and dreams as the ultimate objective of renovation. (I03; I09; I46; P70; P72; P83)

In the workshops, residents had their voices heard as they shared their perspective with the help of the probes material they had documented earlier on. Dwelling histories in their home albums and dreams of good dwelling collages oriented the workshops based on which group work involved clustering residents' experience cards to prioritise positive and negative renovation experiences (Table 5.2; Fig. 5.7). To give an example, the blueprints were found that cryptic that even an appropriate education is not always sufficient. One of the residents, called Raili, was educated as an architect and was practicing her profession in urban planning but still found the blueprints unclear. Raili said that the thorough 100 pages planning document accompanied with layouts required a lot of time to absorb and while the language was specialised it was too difficult to determine the crucial aspects affecting the final renovation results. How her current bathroom would change and how much that would cost? Are there alternatives? Raili felt that even though she was a member of the board, she had not a genuine opportunity to influence decisions because she felt not been able to comprehend the design proposals and therefore was not able to make conscious decisions. She was afraid of suggesting alterations because it was always unclear what would be the monetary impact. Probably Raili as a board member was particularly aware of her restrictions in understanding the design proposals due to her professional know-how. In general, the effect of the abstract planning phase on residents is that as a client they do not understand what they have ordered and the results surprise them. (P83; P92, 26.)

FIGURE 5.7
Snapshots from the user experience workshops. Residents presenting
their dwelling histories (1). Group work among residents, repair
construction professionals and design researchers (2–3). An example
of the finished experience board (4). (P49, 8; P55, 9, 22; P68, 6, 11.)

The encounters evoked intensive discussion among residents and renovation professionals on how to deal with these pain spots of renovation. Residents told in the interviews in 2007 that they appreciated they had had an opportunity to interact with professionals outside their replumbing project. Residents got new information from professionals that they used later on in asserting themselves in the replumbing project, and were for the first time able taken seriously when they shared their insights to those who worked at repair construction (I13; I20; I25; I31; I35; I37; I49; I52).

Those professionals who had been or were working in some of the housing companies' replumbing projects got tangible feedback to their work that surprisingly was often positive and not just negative critique (I30). Professionals had also an opportunity to justify their work and decisions that led to discussions where residents started to better understand the professional perspective (P70; P72; P83). What was perceivable during the workshops, was confirmed by the interviews in 2007 where participants told about their experiences.

> "There isn't any right or wrong solutions. There are different solutions that one should always remember to justify. Whatever is the solution, schedule or cost, it is not a problem if it is well justified." (Dweller, shareholder, I20.)

> "Here we talked about replumbing but in future the idea will be applied in all repair construction. Tools have been developed to be applied in all renovation concerning housing companies." (Planning manager Jarmo Halonen, I30.)

Above, a resident and a repair construction professional offered examples about the user experience workshops, where the first major step were taken to get professionals and residents closer to each other. (I01; I09; I13; I20; I25—26; I30—31; I35; I37; I46; I48—49; I52; I54; I56—57). Establishing encounters then resulted here better reciprocal understanding of each other's perspective and situation. With this way, empathy was built directly into interaction among participants instead of interpretation of user material among design researcher or project members that has been typical in probes studies (Mattelmäki 2006, 88—96). Facilitating encounters to collectively interpret user study material was in line with the collaborative design approach in Future Home that emphasised continuous learning by doing instead of handing out results. (I03; I09; I46; P70; P72; P83.)

Synthesis workshop for
                    building a vision for repair
                    construction

The IKE preliminary study met its culmination point at *the synthesis work-shop* that was organised among extended professional network to share preliminary study findings with larger repair construction community, to gather development requirements for repair construction, and to induce development of resident-oriented modernisation (Table 5.2). The synthesis workshop was also important in disseminating the project ideas in addition to preceding press release, speeches and articles (P01; P28; P59—61).

The project group carefully planned who to invite in the event. All of the 33 participants from 25 organisations attending the workshop were considered important actors in making a difference in repair construction, either by being much experienced practitioners or central institutes that directed the field practitioners and users. At earlier project phases, the network of people had involved 15 organisations comprising of project members, repair construction professionals who were working in the renovation projects at the studied housing companies and visiting design researchers, which expanded into 30 organisations during the synthesis workshop, more than doubling the breadth of representative stakeholders. (P09; P16; P30; P46; P56; P64; P70; P72; P80; P83.)

In line with the aims, the synthesis workshop was titled *Resident-oriented housing modernisation*, which was now used for the very first time and was going to be the title of the final report (P58; P92). The project group had analysed the qualitative user study material and the insights from the user experience workshops, and divided the insights into six themes to be used in the synthesis workshop for presenting, discussing and co-defining the initial development requirements for repair construction (Fig. 5.8). The themes were 1) resident's everyday, 2) resident's wallet, 3) communication and interaction, 4) roles and responsibilities, 5) organising and executing renovations, and 6) new products and services (P78—79). The discussions moved between practical questions such as how to grant loan for individual alteration work and principles such as whether the housing company system is applicable to renovation at all (P79).

Since IKE as a preliminary study wished to induce development, we emphasised that developing repair construction is a common issue also with practical means such as organising the workshop again at the design university premises to offer a neutral ground for encounters. Although the studio theatre's black space was chosen for its functionality and dramatic atmosphere as a symbol of a new start.

> "I remember the atmosphere. It was exciting. [...] The
> space was dramatic. It was dark, you could move about,
> you did not disturb others. Methods of drama were
> in use, maybe by accident or purposefully. [...] It must
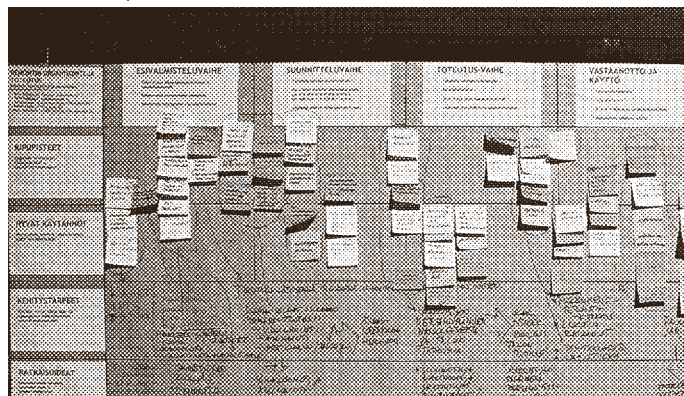
FIGURE 5.8:
Snapshots from the synthesis workshop. Groups starting their
work after orientation (1). Multidisciplinary stakeholders share
insights and vision for the future of repair construction (2–3). An
example of the finished thematic board (4). (P78, 20, 26, 43, 44.)

have been well rehearsed workshop, not just another
pull that what should we do, but it was well planned.
[...] Workshop need to be really good so that busy
people feel they get one's time worth, a personal user
experience." (Research director Kimmo Rönkä, I03.)

We wanted thus to deliver a holistic workshop experience to evoke
activity. That was a good strategy because also an interviewee in 2007
criticised the over-popularity of workshops which had led to too many
poorly organised events and "workshop exhaustion" (I63). It was not
enough just to gather up to use experts' time for an unclear objective;
rather workshops should be carefully organised. People commended the
carefully planned synthesis workshop about an interesting and timely
subject that had been unexplored (I18—I19; I21; I23—24; I26; I29—I30;
I33—I34; I39; I42—I45; I48; I53; I54—I56; I58—I59; I61—63).

> "I think it was a good way to deal with this kind, at
> that stage quite a large, uncontrollable lump, issue.
> Only after that work did things start to get organised
> and that was the way to tackle the real problems.
> There used to be so-called facade issues that had
> seemed most visible but they turned out to be mere
> consequences of something else." (Building manager
> Arto Huttunen, I21.)

The main achievement of the synthesis workshop was the collective
learning process that grew awareness of the resident-oriented modern-
isation and drew actors closer to each other. In the beginning of the
workshop the participants could have been divided roughly into three
groups having different baselines on the ideas of resident-orientation and
housing modernisation: the IKE members who had developed the idea,
people who had cherished the idea in their practical work in some way
or another, and people who attended the workshop out of their curiosity
to hear the latest news in repair construction (I18—I19; I21; I23—24; I26;
I29—I30; I33—I34; I39; I42—I45; I48; I53—I56; I58—I59; I61—63). During
the synthesis workshop, the problem of repair construction was formed
into a holistic issue that deals with multitude of issues considering
people's everyday, technical and service processes, communications,
finance, offering of personalised solutions, visualisation of possible
outcomes, gathering of knowledge, governmental guidance and educa-
tion, and requires new and more know-how on user-oriented renovation
(P79). Basically, everybody agreed that the existing technologically-driven
knowledge and attitude had to be reconsidered and developed to one
that takes the residents' everyday reality into account.

5.4 RESIDENTS' WORLD AS A SOURCE FOR ESTABLISHING RECIPROCAL EMPATHIC ENCOUNTERS

The process of the user study and the series of workshops gathered 67 people from 30 organisations representing different social groupings (residents, repair construction professionals, and design researchers), and different roles in the project (project and steering group members, informants, and invited participants) to encounter, share ideas, learn from each other, seek a common language, and synthesise a shared vision for repair construction (Fig. 5.9).

40 professionals represented a variety of people working in the Finnish repair construction field. In IKE, the represented disciplines were engineering, architecture and construction business, communications, governmental and city organisations, housing companies, NGOs, real estate management, manufacturing, and research institutes. Even though this was a quite comprehensive set of professional representatives, there are also many others involved and the amount of stakeholders is growing.

20 residents, then, represented the laypeople who own and live in the apartments that face replumbing. They feel the actions in their everyday lives, particularly, when the construction work starts, and they need either to move out for a while or to cope with the distraction, noise, dust and so on created by the building work. They also pay the final costs, if not directly as apartment owners, then as increase in rent.

7 design researchers, including the author, were invited to contribute for the purpose of developing user-oriented housing renovation practices. We came outside the construction system without established relations within the professional housing renovation network. We design researchers employed their know-how in order to better understand residents' experiences and as such help to synthesise the vision.

FIGURE 5.9
IKE was an encounter of repair construction professionals, design researchers and residents.

COLLABORATIVE DESIGN
Empathic and participatory design research approach

ENCOUNTER
at the IKE project

REPAIR CONSTRUCTION
Multi-disciplinary professionals

RESIDENTS
Everyday perspective on housing companies at replumbing
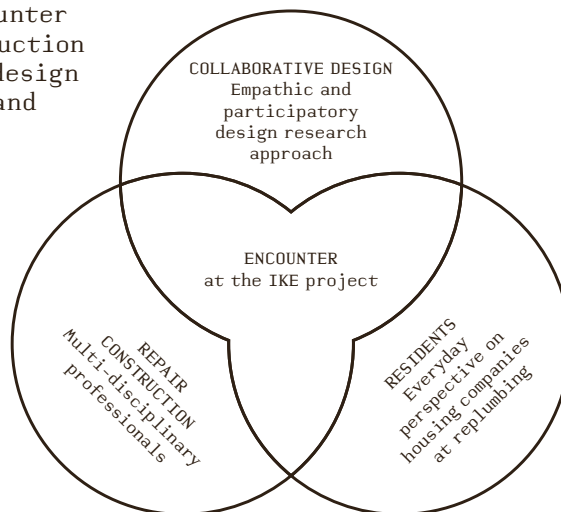
Among these social groupings, residents had a particular role with respect to establishing reciprocal empathic encounters. Their experiences and perspective was the basis of interaction and analysis in the project (P04; P07; P13—15; P18—19; P23; P50; Thackara 2005). Recently the value of collective making based on user perspective has been emphasised in design literature (Halse et al. 2010; Mattelmäki et al. 2014). User perspective has been applied in building policy and urban planning, but not so much to introduce better housing to support people's everyday (Pirinen 2014, 24). Development to include users in the processes relates to the Land Use and Building Act that ensures citizens have the right to participate in the preparation process, planning is high quality and interactive, expertise is comprehensive, and there is open provision of information on matters being processed (D084). In practice this so-called communicative turn in planning, however, is quite limited and has not typically enabled citizens to fully affect the process but often culminates in presentation of a draft plan for public inspection or other activities involving getting feedback for professional plans (D134).

In IKE, the interpretation of the user was different and had a different purpose. If in these above-mentioned examples the focus has been in establishing requirements and getting feedback based on interaction with users, users were for us the inspiration of development in IKE (Keinonen & Jääskö 2004, 81—113). Residents' world was thus seen as the rich well of everyday experiences, emotions, insights, and aspirations that were taken as the source of collaboration in the project (I01—04; I09; I47; I50; I61; I63; P04; P07; P13—15; P18—19; P23; P50).

This approach is similar to the current trend in urban and regional planning. In his interview, Kimmo Rönkä described a similar collaboration that takes into account the user among multiple stakeholders is becoming more common also in regional development work.

> "Triple helix is such a regional development model
> in which businesses, the public sector and research
> collaborate. As soon as we add here the user for
> the fourth party, it becomes 'the quadruple helix'.
> Nowadays it is not possible to get too far without this
> fourth viewpoint. We need to kick up an upward spiral.
> So, IKE was about the quadruple helix. If you consider
> the researcher's profession, it is to go and gather real
> people, real contextual situations. That's the sort of
> the cutting edge of the quadruple helix research."
> (Research director Kimmo Rönkä, I03.)

Recently there have showed up several examples of the so called quadruple helix development in housing, urban and regional planning at the design university (nowadays Aalto University). For housing research, the user has been introduced as the holistic experiencer whose ideas

on dwelling are not limited to the apartment but also involve other dimensions such as area, building and objects that compose bundles of attributes (Pirinen 2014). Participatory urban planning has been supported with digital tools for everyday people to explore and to devise a more democratic vision of cities and technologies (Saad-Sulonen 2014). Moreover, there are several recent projects where different kinds of partnerships have been established among users, or simply among people, business, public sector and design research. Examples of these include such topics as supporting communities, enabling wellbeing, and developing suburbs with design (Botero 2013; Heikkinen et al. 2013; Keinonen et al. 2013).

In these projects, one of the common concerns has been how to make the residents voices heard in the professionally-led practices. That relates to the participatory design approach that was originally concerned with empowering users who were central stakeholders without resources to affect their situation, and has recently also focused on networking to generate starting points for future appropriation (Björgvinsson et al. 2012; Braa 1996; Buur & Matthews 2008; Nygaard & Bergo 1975). Typically, empathy then has been highlighted in design to build rapport with users in order to gather information in an inspirational manner that would enable co-creation (Mattelmäki 2006; Mattelmäki et al. 2014; Sanders 2005). Empathy building has thus often focused towards users: designers and partners try to understand the feelings and situations of the people who eventually live with the designed solutions.

In IKE, we shared these ideas even though majority of the discussion was not yet published but maybe was perceptible as a Zeitgeist (Koskinen et al. 2012, 166). Our particular aim was to build reciprocal empathy between residents and professionals to enable equal partici-pation in the different user study and workshop phases of the project process that would support reflection, building ownership and induce future appropriation. The user study was conducted in three housing companies comprising of contextual interviews, focus groups, design probes and user experience that sequentially exposed various point of views on residents' renovation experiences. The two kinds of workshops were organised to collaboratively share and vision for repair construction based on the learning in the user study.

During the user study and workshop process reciprocal empathy was actualised in three ways. Firstly, while collaboratively generating alternative strategies for tackling growing repair construction, the social groupings started to build reciprocal understanding based on residents' renovation experiences (I01; I09; I46; I48; I54; I56; P70; P72; P83). Following the empathic design approach (Koskinen et al. 2003), we tried to build understanding about the residents' world in such a way that residents themselves started to better understand their own situations, repair construction professionals were able to reflect their professional practices

through understanding residents experiences, and design researchers facilitated collective synthesis of the vision for repair construction based on the empathic understanding.

Secondly, following the ideas of participatory design (Clement & Van den Basselaar 1993), we built reciprocal empathy between residents and professionals in workshops to empower residents and to facilitate building ownership on developing repair construction. When residents felt their voices were heard, also they started to listen to the professionals, and the workshops ended up in quite equal discussions on how replumbing should be organised so that it would meet residents' everyday needs. The user study and framing of workshops induced reciprocal understanding because with these means the resident perspective was equal to the professional perspective, neither party was accused of failures but they were both challenged to collectively find solutions for better repair construction processes. (P70; P72; P83.)

Thirdly, design researchers empathised with both the residents and the professionals in order to facilitate their reciprocal empathy building. The user study and workshops were designed in such a way that they were interesting for both parties, similarly to methods of empathic design that highlights the value of distinctively designing each study to communicate the aims and spirit of the ongoing project (Mattelmäki 2006, 65—98). Moreover, the process followed the idea of project management in Future Home where the whole process was built around sharing and learning by doing, which also made us carefully consider the professional perspective: how to conduct the user study and workshops in a way that would fascinate repair construction professionals and facilitate learning by doing that would have a social impact. (I03; I09; I45—46; I53).

The reciprocal aspect of empathy empowered particularly the resident participants and evoked ownership particularly among professional participants. The participants then built a community of advocates of user-oriented repair construction whose members were committed to the ideas that were collectively generated in IKE. According to Kanter's studies on utopian communities (1972, 65—66), the core of commitment to a community is "[t]his reciprocal relationship, in which both what is given to the group and what is received from it are seen by the person as expressing his true nature and as supporting his concept of self". During IKE, reciprocal relationships that were created in empathic encounters share similarities with Kanter's mechanisms, particularly, *investment* to bind oneself through using time and effort for the process, *communion* to have an equal opportunity to contribute to benefit through connecting, belonging and participating, and *transcendence* to experience a revelation that is fundamentally realisable only in community (Kanter 1972, 80, 93, 113). Also *renunciation* to give up previous conceptions and practices had to take place among repair construction professionals in order to build commitment to user-orientation in repair construction

instead of focusing on optimising costs, schedule and outcomes on a technical basis (Kanter 1972, 82). Instead, the mechanisms of *sacrifice*, to give up something as a price of membership, and *mortification*, to give up individuality to fulfil the social model offered by the community, are quite uncompromising aspects that do not describe the rather decorous process in IKE (Kanter 1972, 76, 103). In contrast to the utopian communities that Kanter has studied, the IKE community was not located anywhere, did not have any superior leader or directives and its encounters were partly limited to the short time of running the project, but typical to professional practice freedom of choice, public behaviour and perceived irrevocability affected instead conditions for commitment (Pfeffer 1981, 291—292). Commitment in regard to IKE thus concerned voluntary binding of oneself to the shared vision that was publicly declared as the feasible approach to deal with the complex system of repair construction. Participants then by choice built new commitment through reciprocal empathic encounters that were based on exploring residents' world.

5.5 MAKING SENSE OF AN ALTERNATIVE FUTURE FOR REPAIR CONSTRUCTION

The ministry commissions these kinds of preliminary studies to activate development on issues they consider essential for society in the future. Therefore the answer "it was a start" that many interviewees gave when being asked to describe the project, was a desired result of IKE as a preliminary study (I01—04; I47; I56; I62—63). IKE was meant to be a new beginning, but what made it such a special project was that it influenced the work at business, government and media beyond expectations. It was an exciting project, in which resident-orientation was used to make collectively sense (cf. Krippendorff 1989; 2006; Verganti 2009) of an alternative future for repair construction. Sense-making started to transform the idea of repair construction from a purely technical act to a process that involves residents' lives. This mindset transformation helped to see that renovations are not a necessary evil but a meaningful opportunity to improve living, and inspired a large variety of development during the following years to introduce solutions that would fit the idea.

> "We know that most of the renovation work is regarded a necessary evil, something that needs to be done. It is boring for people. In this study, the starting point was how to combine these boring things in a way that they would be comfortable, natural, or at least as little as possible harm. It was a good observation that renovations need to be made a positive experience."
> (Architect Harri Hakaste, I61.)

The new objective of transforming renovations into a positive experience was based on the ideas of user-oriented collaborative design that we design researchers from Future Home introduced. Namely, the idea was based on Patrick Jordan's (2000) pleasure framework, which aims at going beyond usability by introducing kind of pleasures that people can have with products. These pleasures are physio-pleasure dealing with visual, audio, tactile, and olfactory senses, socio-pleasure dealing with interaction with others, psycho-pleasure dealing with the mind and offering pleasure through challenge, learning and problem solving, and ideo-pleasure dealing with values that are met with products and therefore satisfy the user (Jordan 2000, 13—14). Following the design for user experience ideology, I introduced this framework, first, to frame renovation as a process whose attributes comprise its function, and secondly, to highlight that renovation should serve dwelling and its actual function is to improve the dwelling experience by improving its usability and considering the pleasure aspect (Jordan 2000, 4—6; P07, 4). My idea was to explore renovation as a process that enables better living and would bring about positive experiences, and this way to move the focus from tackling challenges to dreaming about repair construction as a field that professionals could be proud of. It fundamentally challenged the original idea of technical execution and moved development of repair construction to a whole other level that does not start from incrementally improving the existing practices but from considering radically what is the actual potential of repair construction. It sparked debate about the meaning of repair construction, similar to the sense-making process during any product or other design process (Krippendorff 1989).

The aspiration for positive renovation experience was based on extensive user study and related reflection that "explain[ed] how renovations should be handled from the resident point of view in words of one syllable" (I55). By doing this, IKE introduced a necessary but previously ignored discussion on housing renovation.

> "IKE was probably the first user-driven research at the housing sector that highlighted qualitative methods, empathy on users, and a learning-by-doing process. Many things came together with a small stake. It was not research as we know it. It is just awful to say but often research is only research, but this was a genuine learning process, learning by doing. And then it was a paradigm shift for user-orientation, that is what the process was about. It aired the Ministry of the Environment." (Research director Kimmo Rönkä, I03.)

The discussion was new and provoked reactions.

> "These methods ranged from playing with dolls to who knows where. I think it was somehow terribly exhilarating, because we are an engineering company where the majority are men and no one would ever do anything so radical. [...] After all we are all engineers, and in a certain way our thinking probably follows similar paths. When someone with new type of thinking is among us, you get astonished that—just a moment—you can also think like that!" (Director of business sector Taina Koskelo, I60.)

In addition to excitement, I remember in the beginning of the project there were project group members who expressed their suspicion to the novel user-centred approach in some of the first meetings. Some engineers even laughed out loud to our user study ideas that seemed unsuitable for their professional practice. I used careful reasoning, for example with the ISO 13407 human centred design standard (1999), to persuade them to work with us. The standard, other detailed presentation of the user study plans, and collective writing of questions for residents made the approach more acceptable for the technologically-oriented people bit by bit but, eventually, the findings from the user study spoke for themselves and convinced that qualitative and creative user study was very worthwhile. The serial storytelling of residents' experiences intrigued project and steering group members and provoked new ideas and perspectives for professionals. Towards the end of the project resident perspective seemed to merge with their professional thinking. In workshops, where professionals beyond project organisation were invited, the residents' perspective did not seem to cause any special confusion. I suspect that the newness of the approach could have raised more criticism, but the fact that IKE was commissioned by the ministry partly justified its alternative perspective and creative activities, and also attracted people to find out about what was going on and improved the impact the project made. (I01—04.)

Also the qualitative approach was new for repair construction. Traditionally, studies commissioned by the ministry had been based on quantitatively comprehensive studies in which methods such as queries or statistical analysis had been applied. The quantitative studies were used to examine issues that have already been framed. This time in the preliminary study we were exploring repair construction more holistically that could not have been quantified but needed a more open-ended approach. (I24; I60—61.) Architect Harri Hakaste, who develops governmental guidance in the ministry, believed that the change from quantitative to qualitative research worked especially well in the renovation context.

"The project addressed quite deeply people's feelings
in a few cases. Surely this is a natural target for
qualitative research when talking about the existing
housing stock and renovation projects. There the user
is essential, even more central stakeholder than at new
building construction because in addition to building
the outcome also the process is important there."
(Architect Harri Hakaste, I61.)

The qualitative approach helped to concretise residents' world in such a
way that made it understandable and interesting. The rich material was
portioned along the project, particularly according to the proceeding
user study and workshops (P04; P07; P13—15; P18—19; P23; P50). This
is similar to event-driven design, an approach presented by Eva Brandt
(2001), in which each event is a milestone that launches a new set of aims
and tasks that will be finished by reaching the next event. It emphasises
collaboration and learning that in a form of events drives the develop-
ment work forward. Similarly in IKE, the activities with the housing
companies, project meetings and workshops were events that gave a pace
for the process and defined what to work with in particular phases. We,
design researchers, presented our ideas about conducting the user study,
and brought in new fresh findings as soon as they were available in the
form of presentations, descriptions of housing companies and personas,
quotes from the user study and physical samples of the user study that
were reflected in the project and steering group meetings and workshops
(P07—08; P11—19; P22—23; P33—34; P44—45; P48; P54).

Additionally, preliminary studies commissioned by the ministry
are typically set for finding an answer for a pre-defined problem to
help governmental work in presenting a paragraph of law or a particular
steering or funding system (I04; I47; I63). This time the process had
more freedom for exploration, for which empathic design approach
fitted well with its explorative tools and attitude (Koskinen et al. 2003;
Mattelmäki et al. 2014).

"The IKE project was like a bright-eyed joint venture,
which was not riveted to the outcome in any way, but
we were able to find something new. It was fun in
that. Sometimes working groups are established in one
bound idea to produce a novel legal clause or a specific
system, but here we had more space and freedom to
discover new things. And it seemed to affect to our
happy mood, which we had all the time. When people
are pleased to do stuff, it seems to lead also into
better performance." (CEO Ukko Laurila, I47.)

Even though this open-ended exploration made the process unforeseeable in regard to systematic management that would have ensured finishing the project in time, it affected the atmosphere. The overall impression of IKE as the eight-month-long preliminary study was positive and optimistic, even enthusiastic. CEO of Finnish Real Estate Federation, and chairman of the IKE steering group Ukko Laurila was one of those who were excited about the project and enjoyed its new approach. He had a long experience in charge of the real estate federation and participating in various research and development projects. Laurila stated twice during the project that IKE was "the best project in 15 years!" and "the first exciting project on housing!" (P96).

The project participants praised particularly the collaborative approach that created favourable circumstances for the project with direct interaction with residents' renovation experiences (I01—04; I21; I42; I47; I50; I54; I56; I58; I60—61; I63). Engineering is "likely to take a more matter-of-fact approach, and a straightforward focus into practical problems" (I60). The approach at IKE was instead more explorative, emotional, it opened issues and allowed collective wonderment and sense-making following the ideas of participatory design that enables empowerment and building ownership (Clement & Van den Basselaar 1993; I01—02; I60; Nygaard & Bergo 1975).

> "It was a different way and I think it was the preferred method to be courageous enough to collect various experts together, and try to build a shared language and a common objective, and then try to make things happen in the project." (Chairman of the board Heimo Levamo, I54.)

> "I had never previously been involved in a process that would have been led the same way. We have had projects with the Helsinki University of Technology, but it has never been discussed with what methods and what processes to make knowledge visible. It was apparent that when the process is kind of a, let's say, multifold, there will come much more variable, multidimensional information out than from the engineering-led processes. It was really rewarding." (Chairman of the board Risto Vahanen, I02.)

The continuous, qualitative and open-ended "learning by doing process" (I03) combined different perspectives and issues that concern repair construction of housing companies in Finland. Along its path, the IKE process combined qualitative user study (experiential aspects) with expert knowledge on technical renovation, which provided a variety of both objective information and subjective insights for building a picture

of the renovation phenomenon and exploring collectively an alternative future for the field. Broader aspects of renovation including technical, managerial and governmental issues were discussed in the project and steering group meetings as well as in the workshops. Sometimes discussions involved critical debates on the current practices, such as the housing company system, that seemed to hinder renovation and modernisation of ageing buildings that would have needed radical measures. The world of users provided a shared reference point to make sense of an alternative future for repair construction in these discussions: everybody were able to relate to the residents' everyday stories that were tangible and impartial. Residents' stories used popular language, instead of a professional jargon, that everybody were able to understand. The thought-provoking stories of residents' dwelling histories and renovation experiences gave examples that participants in different events used in explaining their own perspective. Hence, collective exploration shaped the shared language and vision for resident-oriented repair construction.

5.6 VISUAL STORYTELLING FOR REIFYING THE VISION

During IKE, we design researchers acted both as researchers and designers. Research activities included conducting the user study and the workshops that were analysed and thoroughly documented in the final report (P92, 21—48). Design activities included traditional design tasks, such as graphic design, and open-ended exploration and conceptualisation to reify the vision for repair construction. This combination of analytical and conceptual approach was appreciated as a unique contribution to a preliminary study by many project participants (I01—04; I47; I50; I60—61).

> "I was surprised that, as well as [Future Home director] and [author], how quickly you were able to analyse a new area. As far as I've understood you have not been involved in such a problem field before. But how quickly you learned to see these essential things out there, to integrate and conceptualise! It is apparent that your education—well, I don't know whether it's your personal aptitudes plus training—but you have got a very good ability that again purely technology-driven people may not have because they are not taught to perceive things and analyse and conceptualise that way." (Chairman of the board Risto Vahanen, I02.)

Repair construction as a professional field had been a new subject to us design researchers who were educated as industrial designers and minored in user-centred design. Even though we were supported by Future Home director, who was more experienced in research at the construction industry and had background in engineering but who

was also new with repair construction, our main reference point in navigating repair construction was the holistic everyday aspect of residents' renovation experiences. The richness of qualitative user study, however, meant that everything could not be kept, and many stories and examples were set aside for the sake of keeping the process vital and to able to choose the main message. The process was thus quite often an intuitive exploration as we made the selections what to emphasise and where to focus on our activities based on the situation at hand. To help making the decisions we used the resident perspective: if the issue was meaningful for the resident point of view, it was regarded meaningful also for the preliminary study, but if the issue did not gain growing shared attention in the spirit of co-experience (Battarbee 2004), it was something that we simply forgot.

In this open-ended exploration we took advantage of our design skills. Throughout the project process and in synthesising out-comes and the vision for repair construction, we applied the traditional design skills of storytelling, visualisation and solution-orientation as well as the ability to tackle a new subject based on the universal scope of design (Rittel & Weber 1973; Buchanan 1992). I, for example, visualised the vision of resident-oriented modernisation (P92, 66) to reify the message in a simple way that synthesised the shared aim of the field in one figure. We also gave an identity to IKE, as research assistant Riikka Rahtola designed the logo for the project (Fig. 5.10), and I designed the template for presentations that were used consistently by all the project group members in their documents (P06; P13—15; P17; P20; P23; P29; P59—60; P73—75; P81; P85—86; P89—91). The logo aimed at visualising the spirit of IKE—Living Cycles of People and Buildings—by showing both the people and the building. It purposefully chose the perspective of dwelling and people, and illustrated the special moment of renovation within. The abbreviation IKE and the house was used in all the variations designed for each housing company illustrating their renovation phase. This was also a practical design decision, as it helped in identifying user

FIGURE 5.10
The IKE project logo (1). Distinctive logos for the studied housing companies respectively to their renovation phase (2–4). (P41, 2–5.)

study material without compromising residents' identity. With logos and other small marks design researchers knew whose material they were dealing with without using the residents' names. The logos were also a means for design researchers to orientate to different phases and to communicate findings.

This kind of conceptualising and synthesising project findings in a visual form reified the IKE agenda. This creative activity is said to still be an integral part of design in so-called *fourth-order design*, in which design focuses on organisational change that involves collective interaction in complex environments (Buchanan 2008). As Buchanan (2001) states, the new order of design does not abandon the traditional design approaches such as making and visualisation but instead takes advantage of them even though focus has shifted from material systems to human systems integrating information, physical artefacts and interactions in environments such as we did in regard to repair construction. Feedback to IKE further supports other research that has identified these traditional design approaches distinguish design from other practices such as management or engineering (Buchanan 2008).

> "Compared to the normal bureaucratic or authority-driven documentation—or maybe researcher-driven approach as they tend to have quite a donnish presentation style—the way results were personalised here reflects of course how one is capable of capitalising image and visual composition. It helped the reader to understand the results. In a way, the experience that the researchers had found in the study was, in my opinion, conveyed well in the results." (Architect Harri Hakaste, I61.)

We design researchers produced several presentations and summaries on the residents' renovation experiences and insights into technical renovation process from the user perspective during the project, of which some were elaborated to be presented in the final report (P48; P60; P74; P81; P85—86; P88; P90; P92, 22—25, 28—32, 35—38). Figures 5.11—12 illustrate examples of these visualisations design researchers made in IKE to convey residents' renovation experiences. One form of visualisation were about residents' experiences of which there is an example of a collage of a resident's dwelling history and experiences at the replumbing project (Fig. 5.11). The different dimensions of personal renovation experience including the dwelling history, preferences in dwelling, and positive experiences and critical points of replumbing draw a holistic picture of a person's life and experiences when looking from the housing renovation point of view. Figure 5.12 then represents a compilation of telling the story a replumbing process in a housing company. The story joins technical facts to residents' renovation experiences in such a way

"I am from a working-class home in the heart of Sörkkä. Born in the 30s Great Depression I had no other dream than to have **a home where my child would have a small nook for her privacy**.

"When they were building these Beduin tents, Kaisa used to live upstairs. She called my daughter and off they went with a basket. **We had such a nice bunch of kids, they played along in the courtyard. Nowadays we have only three small children**."

"It's a good place to live here because we have **broad forests**. It's any backwater no more as people called it 50 years back when we started to build the house."

I go **swimming** four times a week in Pirkkola, I throw a kilometre. In the Central park you can go **skiing**."

Aulikki
"I was the founding partner and today neighbourly help"
pensioner

2 homes

2 rooms +kitchen

75

6 person family in a 22m² apartment | Involved in building; alone in a studio, family in a duo, alone in duo

1930 1940 1950 1960 1970 1980 1990 2000

Positive experiences

"It was that **underfloor heating** that is absolutely gorgueuous, fabulous. I also have completely **new kitchen and bathroom**. The original doors were terrible, they had been daubed five times. These are just magnificent. Including the electricity that was renewed. It is also a damn significant thing to have."

Critical points

"I used to be working at construction industry. I think they didn't take too much notice on their gear on the yard, they were a bit untidy. Lady from the neighbouring house: couldn't you pick up your stuff. **Terrible skip on the courtyard**."

Bathroom threshold is too high, apparently for technical reasons but elderly people cannot raise their leg over.

"–I don't have any underfloor heating, said 90 year old neighbour.
– Surely you have, I replied.
She had it off. I switched it on and said:
–Don't touch it, I'll come to see you tomorrow. It was all warm. Elderly people miss instructions. We used to have the light switch outside and now she fumbles for that even though the switch is inside.
–**Try and remember that the switch is inside, don't touch this one**.
Maybe I should put a tape there to tell 'don't touch this'."

Replumbing was expensive, my share was 24000€ – but surely there is lot to repair. **They should have however considered how much residents need to invest.**

FIGURE 5.11
An example of describing Aulikki's replumbing experience. (P92, 39.)

As Oy CONSTRUCTION ⌐★★★

is located in a peaceful area by a lakeside

Location	Espoo	**Building year**	1963
Apartments	62	**Apartment sizes**	1-3 rooms of 30-71m²
Rented apartments	~40%	**Floors**	5

	REPLUMBING AT AS OY CONSTRUCTION
OBJECTIVE	In addition to replumbing, also moisture damaged bathrooms are repaired and the outdated technology rebuilt. These actions aim at improving the comfort of living and sustaining the property value.
SUBJECTS OF RENOVATION	• Rebuilding of water and sewer pipes, power and antenna lines, ventilation and reservation for telecommunications network • Apartments: bathroom renewal • Shared spaces: sauna and reservation for laundry room • Painting of stairwells • Renovation of exterior doors, rooftop and water chutes
ESTIMATED COST	~420 €/m2
ATTITUDES	Residents disagreed on the maintenance of the real estate, for which the building manager and the housing company board proposed new far-sighted aspects. During the preparatory and planning phases of the renovation, there was a strong opposition of older people and the housing company board changed frequently. During the execution phase, nobody opposed the renovation project loudly any longer and the situation had calmed down.
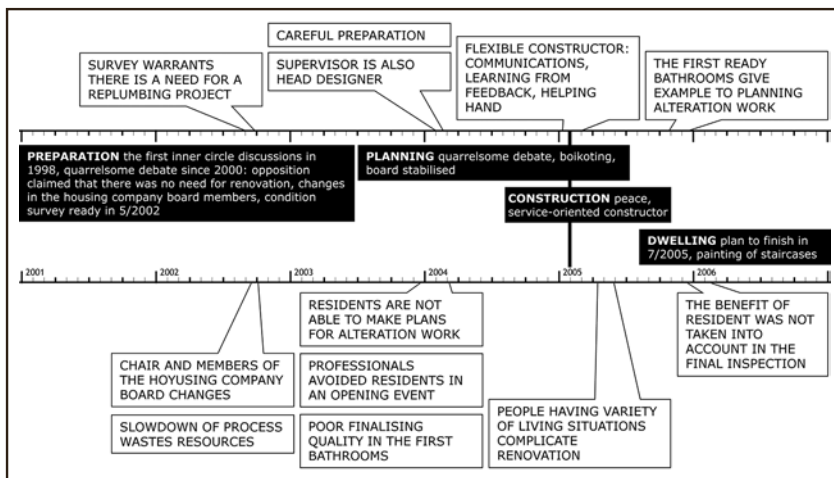
FIGURE 5.12

An example of describing replumbing in a housing company with three different dimensions: the housing company, a summary of replumbing, and positive and negative experiences in replumbing project. (P92, 29-30.)

125

that it tries to highlight issues that were important and meaningful for residents (P45; P54; P63; P67; P69).

The approach that differentiated IKE from other preliminary studies, comprised of a combination of storytelling and visualisation, along with strong user-orientation and multidisciplinary collaboration. Visual storytelling was however not just a presentation tactics but it united research and design activities. In the project, we produced material for reflection and open-ended exploration and reified the preliminary study outcomes with visualisations and stories. In this work, we applied our general design skill to grasp a new subject quickly, the concrete design skills such as graphic design, analytical skills to interpret user study, and conceptualisation skills in building the vision for repair construction.

6. The Ideal Vision: Resident-Oriented Housing Modernisation

The main result of IKE, as an outcome of the practical actions presented in the previous chapter, is the ideal vision *resident-oriented housing modernisation* that crystallises the future vision for Finnish repair construction. It is a radical innovation of meaning (Verganti 2009; Verganti & Öberg 2013) as it reinterprets the purpose of renovation: the previously technically-oriented and professionally-led activity was now seen as a resident-serving process and an opportunity to improve living conditions through renovations. However, it does not discard previous activity but instead combines the familiar technological aspect with the incoming social aspect into a unity. Even though many sorts of user-centred technologies had been presented in other fields over several decades, the socio-technical idea was new for the technically-oriented repair construction that had ignored the residents' perspective. The innovation was desirable because it provides an alternative strategy to deal with the backlog of renovations. The relative advantage of the innovation involve attitude and approach that provides new kind of meaningfulness to professional practice. Moreover, resident-oriented modernisation is an idea-only innovation (Rogers 2003, 13) in the sense that it did not involve any hardware or technological features but rather a new idea that was a

reconceptualisation of the social structure of repair construction, which could then be applied in multiple dimensions. Its form is a vision for repair construction in which residents and renovation professionals are partners at improving living conditions through renovations. (I01—04.)

The vision and the mindset was originally presented in the name of the final report, *Development needs for resident-oriented building renovation and modernisation* (P92), and was embraced along the pages of the report through residents' multiple stories on their experiences on dwelling and replumbing as well as in the variety of development requirements. Despite the fact that almost all project members and invited professional participants had reached a collective feeling of the shared agenda (I01—04; I09; I18; I21; I23—24; I26; I29—30; I33—34; I39—40; I42—I48; I50—51; I53—63), the ideal vision was however not explicated in the report, which actually left it open for personal interpretations. As such the ideal vision that emphasised considering people and improving dwelling was an open-eneded proposal (Verganti 2009, 9—11) that was offered to Finnish repair construction as a new purpose for renovations. It was a reinitiation (Sternberg et al. 2003, 165—167) that provided a new starting point for repair construction to move about.

6.1   THE IKE PROJECT RESULTS

IKE results in the final report present a world that was only seeking its form (P92). In this world residents of apartment buildings and repair construction professionals met in a temporary renovation project space to conduct replumbing with whatever practices were at hand.

According to the IKE project results that are heavily based on the user study in three apartment buildings, the main critical points of renovation are caused by a fuzzy process. The core problems include lack of a common goal, language and open interaction, unclear roles and responsibilities, unsystematic communications, and the general unawareness of service-orientation among professionals. Best practices, instead, are based on the general willingness to cooperate by embracing open interaction in housing companies and among different parties involving the process, reserving long enough time for the project preparation and planning, producing visual representations of the plans, and contractors' flexibility for the benefit of residents. The residents' crucial interest, however, is not in the process of renovation but focuses on the quality of the implementation of the renovation project, as well as concerns the project's impacts on the personal economy and everyday activities. (P88; P92, back cover.)

As the conclusion of IKE, therefore, development of a new resident-oriented collaborative product and service process was suggested in order to invite all core stakeholders to unite and to regenerate an apartment building in the spirit of the ideal vision resident-oriented modernisation (P92, 65—66).

6.1.1 Residents' renovation experiences

When starting to look at renovations from the residents' viewpoint in IKE, the view to renovation process changed from a professional task-oriented process to one that shifts everyday dwelling to a temporal struggle threatening residents' wellbeing and finance. One of the consequences is that the renovation process seems different. The professional renovation process used to include three main phases: planning, execution, and the period of guarantee (P06). From the residents' viewpoint, presented in figure 6.1, the process has four phases of preparation, planning, execution and use (P92, 13—14). The shift revealed that there exists also the phase of preparation in the beginning, and the period of guarantee is actually only a part of the use phase.

As Oy Dwelling was the only housing company that travelled through all the four phases, which as an example sheds light to the mixed reality in the renovation process. In the housing company, planning phase had been long enough for the designers to earn the trust of residents by consulting the housing company board and ordinary residents in various events. Residents' differing perspectives were listened and dealt with in open discussions in these events. The good quality blueprints however did not reach the construction phase, and the contractor did not seem to have understood what had been planned and decided. The residents felt they needed to disseminate information on the plans and even to make design decisions on building site. The contractor also avoided responsibility in other ways, failed some tasks and left doors unlocked after working hours. Once a resident had an unpleasant surprise when making her weekly site tour on a Saturday night and found out that apartment doors were open. When giving a notice of defects, she was responded with an accusation of pure imagination because "the contractor's workers could not have done that" (P69). The chaotic incidents produced accusations that led to distrust and fear. While in this case the residents were relieved when the contractor finished its

FIGURE 6.1
The main phases of a renovation project in an apartment building (P92, 13).
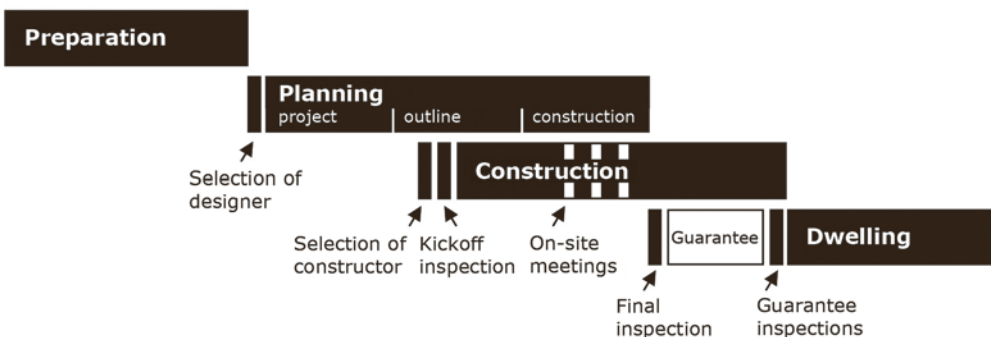
work and dismissed the apartment building, in another case residents commended the contractor and workers for excellent work that saved the whole renovation project. This time the contractor was flexible with residents' needs, learned one's lesson from the first complaints, notified the residents of the construction work progression and in general had a social talent in serving the residents. A young worker, for example, carried an elderly lady's groceries to the third floor apartment when the elevator was not in use, and the entire workgroup was appreciated for their service orientation. Professional workers' flexibility, helpfulness and understanding of the residents' circumstances contributed to a smooth progression during renovation. (P69; P70; P92, 35—38.)

Residents' experiences on each phases from the perspectives of individual residents, resident communities and housing companies were summarised in the final report (P92, 41—48). The description started with the *preparatory phase* that is a critical foundation for a replumbing project. It is an open ended period when residents and the housing company board are speculating whether they would need a renovation project or not. The better the understanding and equality that can be created among the shareholders in this phase, the easier the actual renovation project will be. Residents need a sufficiently long period to attune to the idea and to prepare their individual plans. Open and dialogic culture promote creation of shared goals and visioning at the housing company while inner circles whispering private strategies increase inequality and friction. (P92, 41—42.)

The *planning phase* starts after a housing company makes a decision to start an official renovation project, and hires a professional designer. The work is usually done among the designer, the housing company board members and the building manager, possibly supported by a renovation committee that is comprised of resident volunteers. Otherwise it is often an invisible phase to ordinary inhabitants, and they feel that the renovation project is rather a professional matter than their own. The better the residents are informed of the progression of the planning phase, the more trusting the atmosphere that develops in the resident community. However a challenge remains in that the phase requires expertise in reading and understanding blueprints and plans, which residents do not typically have so well that they could evaluate the options and respective costs (Fig. 6.2). Therefore their comments fall mostly upon details or other issues that the professional designers cannot see focal to the totality. (P92, 21, 41, 43.)

In the next *construction phase* the plans materialise. Experience on the phase will depend strongly on communication skills that the contractor and the subcontractors have. The phase is a kind of a state of emergency when residents' normal everyday routines are distracted. Water supply is cut, renovated parts of apartments are sealed, and a constant dust and sudden noises fill the house. Some people evacuate

FIGURE 6.2
Pictures from an original 1950s bathroom to be renovated in
As Oy Planning (photos by a dweller at As Oy Planning, P65, 2, 6, 7).
Residents wonder about the different options for renovation and
costs for them.

themselves in a temporary dwelling such as to their cottage, at relative's or for a short term rented apartment. Around half of the residents in the studied housing companies continued dwelling at the building site where water and sanitation was arranged on a hut in courtyard (Fig. 6.3). If the professionals are not capable to acknowledge their particular working environment in people's homes that is already a mess, the process may be painful. (P92, 21, 41, 44.)

In addition to having a service attitude, residents expect the workers to deliver excellent handiwork. The end result quality and finesse is especially important and a subject of the final assessment of the renovation project because what is left behind by the professionals, is the environment where residents continue leading their lives (Fig. 6.4). In this *dwelling phase* normal life continues, people start to use the results of renovation, and the outcomes of renovation are tested in real life. Results are good or poor depending on the kind of impact they have on the residents, their daily lives, and their ability to please the eye in each detail. Successful solutions will support residents' everyday dwelling and lives while unsuccessful solutions make residents' activities difficult or prevent them. As much as the technical features and spatial design solutions should meet the usability and accessibility requirements, residents also expect their bathrooms and kitchens are absolutely finished after the final inspection. In practice, the inspection often opens an unpleasant and unforeseen repair cycle, which can last for weeks, months, or years. (P92, 21, 41, 45.)

The most significant factor for residents' renovation experience is the described process itself. In the studied housing companies, the process was not clear to residents, but a professionally framed, fragmented system that is mandatory for an old housing company. Residents are subordinate to the process and feel that they are powerless to influence its progression when the home environment changes unpredictably. Professional renovators are strangers who actually hold a key to your home and intrude to people's private area. Breaking people's natural turf, and filling residents' everyday with unpredictable changes cause different reactions depending on the individual. The best practices identified during IKE involved professionals' service orientation. In addition to interaction, communications during the process is vital for a successful renovation project. (P88; P90; P92, 46—48, back cover.)

Even though the process is important as it affects people's everyday lives, the residents' genuine interest, however, turns to impacts. Impacts refer mainly to the meaning of what you are left with after the renovation project ends but also changes in everyday routines during the renovation process and management of those affect how successful the renovation is seen to be. The cost of renovation compared to the local property value and housing costs is a dimension in the impacts that is a major concern for residents. Each shareholder resident pays tens of

FIGURE 6.3
A resident slept on the balcony wearing a woollen cap in late summer
to continue familiar routines during the construction (1). The ren-
ovation continued in other parts of the building until winter (2).
Demolition, and other sounds of construction continued many months
and were tolerable when using proper hearing protection (3) (photos
by dwellers at As Oy Construction). (P52, 16, 26; P53, 6.)

FIGURE 6.4
Typically a traditional replumbing includes renovation of apartment
bathrooms (I) and some of the shared spaces as a common sauna (2), and
dwelling restarts in a fresh environment. Residents value finesse
of outcomes and compare the costs to impacts and overall housing
costs (3) (photos right and left by a dweller at As Oy Construction).
(P2I, 80; P52, 7–8.)

thousands of euros for a traditional replumbing. It is a factor that may severely threaten people's financial status. Despite the substantial costs, residents sometimes lose preferred features, such as bath tubs being removed against their will, as they are not capable to reassert themselves. Other times new solutions turn out to be worse than original ones. In the end, contemporary solutions such as nice new bathrooms are typically appreciated and may even become a source of boast proudly presented to guests. (P88; P90; P92, 61—62, back cover.)

Residents' role in a renovation project—being either a shareholder who dwells in the apartment, an investor who rents the apartment out, or a tenant—affect the dimension they can affect the process and its impacts. Even though renovations are made for the purpose of renewing residents' dwelling environment, residents were not considered a focal factor among professional renovators and in renovation projects when IKE began. The focus was in "technical" aspects, such as keeping the schedule and the budget, and meeting the expected technical quality, that are measurable by professionals themselves (I21). When a map of central stakeholders of a housing company's renovation project was presented in the final report, the residents were positioned on the top as can be seen in figure 6.5 (P92, 51). In this social construct all residents have a say. Professionals were used to acknowledge the housing company board in the renovation process because it is a decision-maker by being the official client, but the main difference was in bringing in residents as a community of individuals dwelling in the apartment building. The par-

FIGURE 6.5
The central stakeholders and data flows in a renovation project (P92, 51).
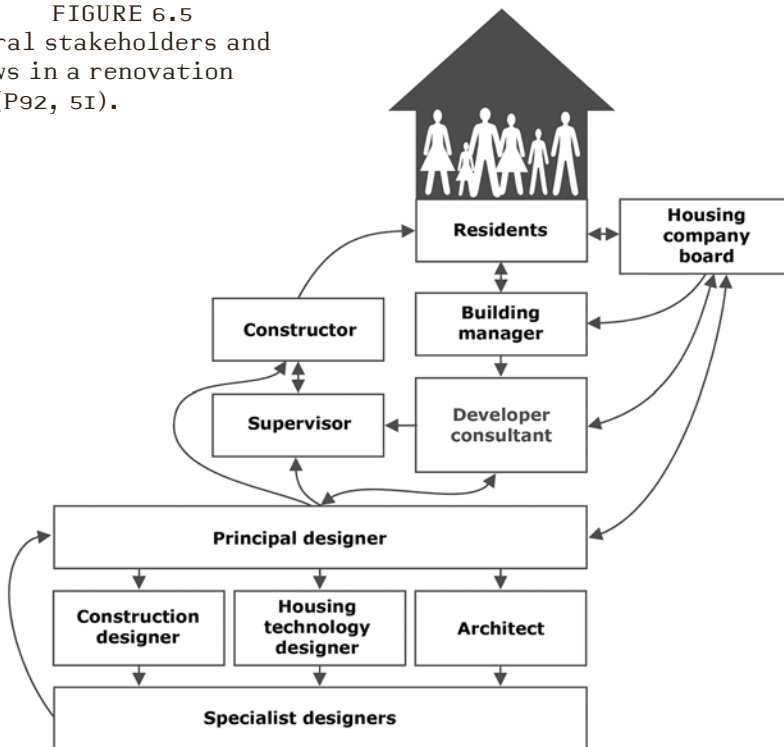
	SITUATION CAUSING RESISTANCE	NEUTRAL ATTITUDE	SITUATION SUPPORTING RENOVATION
LIFE SITUATION Factors affecting basic circuwmstances	Resident have a special life situation: for example serious illness, stress, newborn children in the family or other acute and long-term situation	Normal everyday life: the everyday routines are in control.	Resident has a good life situation: for example free time and energy in use, good economic situation, temporary housing arranged
CHANGE ATTITUDE Willingness and ability to change	Cautious attitude: need for stability, willingness for careful consideration	Ready for a change when there is a justified need	Experimenter: desire for change on their own initiative, the interest to try new things
INTERESTS Areas of devotion	Main focus of attention at a singular thing such as family, friends, work, hobby or other	Desire to improve the quality of life in several areas	Desire to improve housing and home
DWELLING PROSPECT Plans for the current apartment	Short-term: resident planning to move out or does not believe to live long anymore	Unspecified: resident may move if needed	Permanent housing: resident plans to continue dwelling at the same place for the rest of her life
ECONOMIC SITUATION Current situation and future prospects	Tight or even downward economic situation: for example pensioner, families with children	Controlled, relatively foreseeable economic situation: for example single or double income with no kids, family	Good economic situation: for example, upbeat career, children moved away from home, investor of apartment
MEANING OF THE REAL ESTATE Commitment and personal meaning	Consumption: for example, temporary inhabitant, tenant	Preservation of investment value: owner-resident, investor	Personal meaning: anybody to whom the real estate is important
AWARENESS OF THE REASONS FOR RENOVATION	Obscurity: typically ordinary resident, rumours, secretive culture at the housing company, common matters are not directly communicated	Information: typically ordinary resident, information is shared for examples in resident meetings	Broad understanding: typically construction professional or well-informed ordinary resident, awareness of the reasons for renovation

TABLE 6.1
Factors affecting residents' attitude towards renovations (P92, 47).
Coloured boxes exemplify Aulikki who supported renovation.

ticipants in IKE agreed that all residents are actually paying clients who influence the process, and assess the quality of the process and its results. Listening to them makes the process easier and makes more content clients. (I01—04; I09; I47—48; I50—51; I54; I56; I60—63.)

One of the main findings was to shed light on the reasons why individual residents behave differently in renovation projects (P92, 46—48). Professionals used to be frustrated with residents, who appear in every apartment building and renovation project, that oppose renovation, and make the process difficult, socially wearing and eventually delay the schedule. Some professionals accused the residents for being difficult. (I01—04; I09; I47—48; I50—51; I54; I56; I60—63.) Table 6.1 demonstrates that the reason(s) was not being a difficult person but the varying life situations that affect people's behaviour (P92, 47). There are seven core fac-

tors that compose totalities of life situations that cause resistance as well as a neutral attitude or supporting renovations. In the table, grey boxes portray Aulikki who was already introduced as an example of describing personal experience of replumbing in the previous chapter. Aulikki has, in general, a good *life situation* because she is healthy, and has lots of free-time as a pensioner to spend with her wide circle of close people. The *meaning of the real estate* is personally important for Aulikki as she had been one of the people who originally built the house, and therefore her *dwelling prospects* are long-term. Actually, she is determined this is her place until the end. Since Aulikki used to work as an assistant in a construction firm, she holds a broad understanding why replumbing was needed, thus having a good *awareness of the reasons for renovation*. Her *interests* however are broader than home decoration or some other ways of investing in the home. She is interested in improving the quality of life in several areas, especially to remain healthy and lead an active senior life. Another more neutral attitude in regard to renovation relate to Aulikki's *change attitude*: she is flexible enough to be ready for changes if needed but not the one for experimentation in front. The last factor in Aulikki's situation, a negative one, is her tight *economy situation* because she gets her livelihood from a small pension only. The last factor was typically given as the explanation for people's opposition but Aulikki shows that it is not that simple. There are other factors that affect the totality and residents' behaviour. Some are more interested in renovation because they happen to have a matching set of resources and interests. On the other hand, some may oppose renovation because of limited resources due to a difficult family, health or other situation. (P46—48; P39.)

The purpose of the multi-faceted description of the residents' renovation experience in relation to their dwelling histories was to broaden repair construction professionals understanding of their clientele and to be able to have an enlightened starting point for developing repair construction. Based on these above described aspects, professionals could, for example, develop themselves as service providers who may help residents to follow the progress of a renovation project in subtle ways. As it was remarked already earlier, renovation is not of any core interest for residents even though professional renovators tended to expect so. Residents have other interests and a renovation project is an interruption to their ordinary dwelling. They all have their individual reasons—their individual life situations and preferences in life—why they favour or set against a renovation, or take it in stride. The combinations continue endlessly, and therefore residents' renovation experiences are always unique.

The preceding description of residents' renovation experiences is one of the results IKE as a preliminary study generated. In addition to various residents' stories on critical points and best practices of housing renovations, also assessments on repair needs of the Finnish housing stock, renovation project execution, process management technologies, communications, and interaction were conducted (P03; P92, 3, 7, 9—12, 49—60). The aspects unite in the ideal vision *resident-oriented modernisation* that became the major statement contributed by IKE. The main idea was two-fold. Firstly, residents needed to be listened and involved in housing renovations in order to follow the principle of *resident-orientation*. Residents' remarks are not complaints but valuable questions that need to be taken seriously. Each ordinary resident, in addition to the housing company board, should be served as a client. Secondly, replumbing or any other extensive renovations in apartment buildings should not be taken only as repairs to the original built quality of the 1950s, 1960s or 1970s, or minimum contemporary standards. The renovations are instead a momentum for *housing modernisation*, which would mean updating an apartment building to meet contemporary needs. To time improvements and modernisations with renovations is important because without this alliance they would become too expensive and practically burdensome. Renovations are also an opportunity to develop an apartment building to stand out from the masses, to make it more attractive in the housing market and to increase the property value. (I01—04.)

The final report *Development needs for resident-oriented building renovation and modernisation* (Fig. 6.6, P92) was launched in a media event at the Ministry of the Environment on 3rd June 2005. The same day the ministry gave a press release on results highlighting also the main aspects representing residents' experiences, technical process and

FIGURE 6.6
The final report of IKE—Development needs for resident-oriented building renovation and modernisation—was published by the Ministry of the Environment in June 2005 (P92).

communications (P98). The media event started with a word by building counsellor Erkki Laitinen from the ministry emphasising the importance of awakening to the issue. The welcoming words were followed by my presentation on residents' experiences, in which I highlighted that cooperation is essential to the success of a renovation project (P90). Good spirit and an open attitude of all parties makes it possible to find suitable ways of working at a specific renovation project, and enables persevering development of the issues that were identified during IKE. Further, collaboration should also expand beyond construction business to embody larger inter-disciplinary networks. Next, a leading construction communications consultant Juha Salmi presented issues on communications, and reminded that the nation would not survive from the cumulative plumbing and other major renovations if the current horror stories could not be transformed into success stories (P89). If well-managed renovations would include tools for proactive and interactive communications, the general attitude could become favourable toward renovations, and mere cost minimisation would be replaced with maximised added value. Finally, the project leader Risto Vahanen presented the development requirements as the conclusions of IKE, which future developers could follow (P91). (I01—04.)

The requirements were divided into five main development categories that are renovation processes and services, housing company strategy and decision making, technology, financing, and demand and resources. Altogether these categories include 26 individualised themes and proposals in the final report (P92, 62—72). The identified development requirements were further reinterpreted into a table that was published in parallel with the final report on the ministry's website (P93) that in the table 6.2 presents a variety of development requirements, project ideas and wider development areas. The development requirements as presented in the media event, the final report and the table together open an array of improvement possibilities including resident-oriented renovation practices, service capability, competitiveness and long-term preparation for upcoming wave of renovations.

The array of development requirements composes such a vast list that it is not possible to exhaustively present them here. Therefore excerpts of them are presented below, describing the main development issues that were also highlighted in the final report:

> "In this study, the highlighted key developments to meet resident-oriented modernisation are increased strategic life cycle management of housing companies, residential building condition index, resident-oriented collaborative product and service process, proactive and interactive communications model plan, industrial methods and techniques for renovation, individual

	DEVELOPMENT NEED	PROJECT IDEAS	WIDER DEVELOPMENT AREAS
RENOVATION PROCESSES AND SERVICES	Commonly agreed practices in renovation projects	Resident-oriented collaborative service process development through housing company pilots	
	Products to suit individual needs	Possibilities of mass customisation in renovation	Customer-oriented industrial and mass-customisable products in cooperation with service and product suppliers
	Inclusive solutions and products	Accessibility audits in conjunction with renovations	Inclusive design and product solutions fitted to technical renovation project
	Communications and interaction	Proactive and interactive communications model plan for housing companies	A uniform information content for resident-oriented renovation as guidelines, DVD products and web sites
		Electronic multi-channel communications solutions (Internet & TV)	
		Visualisation methods for representing design proposals	Product modelling possibilities in renovations
	Roles and project management	Renovation project management techniques development with housing company pilot cases	Clarification and development of roles and responsibilities in renovations
			Updating training for key personnel in renovations
			Contracting practices in renovations
	Cost information and control		Tools for cost estimation, presentation, and management
HOUSING COMPANY STRATEGY AND DECISION-MAKING	Strategic life cycle management of housing companies	Vision and strategy for "our home building" and life cycle management development with housing company pilot cases	Renewal of the Limited Liability Housing Companies Act to enable decision making and execution of renovation and modernisation
		Building development opportunities for housing companies	
	Transparent technical condition information for apartment buildings	Techno-economic condition indices and surveys	Residential building condition index
	Provoking and motivational communications		National communications programme
TECHNOLOGY	Dwelling and safety during renovations		Improvement of renovation project-term residential amenity and safety
	Industrialisation and alternative technologies	Studies on life cycle costs, benefits, and disadvantages of alternative renovation techniques	Industrial methods and techniques for renovation
	Tidiness, cleanliness, logistics		Demolition and protection techniques, and construction site logistics
FINANCING	Alternative financing models of the housing companies		New financing solutions (leasing, life cycle finance, etc.)
	Individual financing alternatives	Information on repair grants and other forms of financial aid	Customer-oriented individual financing alternatives
DEMAND AND RESOURCES	Regional demand		Regional needs for renovation and modernisation
	Know-how and training	Training for improving capabilities of customer service and end result finesse	Safeguarding human resources for renovation

TABLE 6.2
Development requirements raise issues to developing customer-oriented
practices for different parties involving repair construction (P93).
Coloured boxes indicate highlighted requirements.

financing alternatives, and developing customer-ori-
ented practices for different parties involving repair
construction." (P92, 62.)

The first category of development requirements relates to renovation
processes and services, which was recognised as the most important
aspect of development. Particularly, it was emphasised that what was
needed was a *resident-oriented collaborative service process development
through housing company pilots* (Fig. 6.7, P92, 65—66):

> "The goal should be a collaborative service process
> among residents, a housing company and professionals,
> in which stakeholders renovate and develop the
> apartment building together. The process should aim
> at transparency of the housing company's and its
> individual residents' goals, sensible and clear presenta-
> tion of the renovation process, and resident-oriented
> execution. Goals are met with a service business, in
> which all the stakeholders have clearly defined roles
> and responsibilities. The stakeholders meet at agreed
> milestones to identify common goals and focus on
> them. Companies offering pre-fabricated components
> and services should design their products to meet the
> collaborative process." (P92, 66.)

In addition to acknowledging aspects of process, actors, practices and
tools in relation to the eventual target of renovation, the proposal
followed IKE philosophy to seize renovations as an opportunity to
update the living standard. Updating could happen by diversifying the
living environment and as such by providing a wider offering to meet
contemporary user needs. With good planning and a small additional
cost it could be possible go beyond mere repairs to modernisation, but

FIGURE 6.7
The resident-oriented collaborative product and service process
invites all core stakeholders to unite and to regenerate an apart-
ment building (P92, 66).
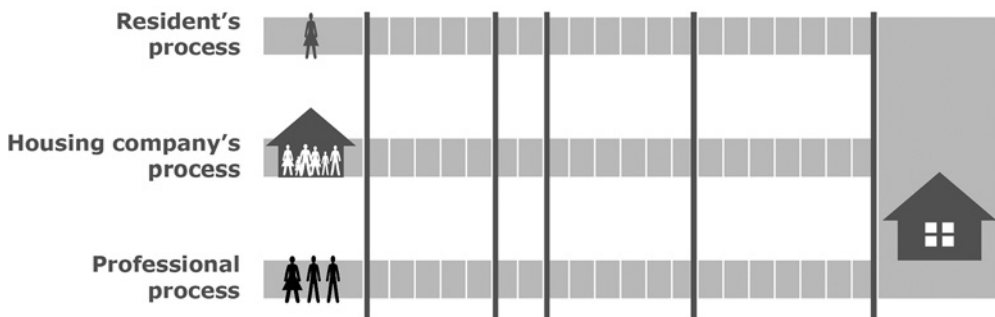
with industrialised practices and mass-customisable solutions we could get much further. Here in parallel with technical and economic objectives of a renovation project, also the end-user wishes and plans should be covered. Therefore the proposal aimed at bringing the ordinary residents into the professional process in parallel with the housing company board, and making the whole process understandable, sharable and concrete (Fig. 6.7). (I01—04; P92, 61—72.)

Part of that would be communications and interaction, which was lacking or implemented inadequately in a majority of renovation projects during IKE. Housing companies would need *a proactive and interactive communications model plan*, which can be capitalised in any project-specific communications planning and implementation. The model plan should explain what kind of information at different stages of the project should be given to whom or by whom, and what communication means and tools could be applied. Communication should be continuous interaction between residents, housing company board members, building managers and building professionals. Honest and thoughtful communication should not sugar-coat the reality but rather promote openness and truthfulness. (P92, 67—68.)

The main proposal of the second category, housing company strategy and decision making, deals with *strategic life cycle management of housing companies*. For that, a vision and strategy for "our home building" (P92, 63) should be created collectively with other housing companies to find long-term goal setting and to develop life cycle management. New service providers are needed to support this activity, and housing companies should learn to demand such services. This is super essential at housing companies that are located in out-migration municipalities because without a proper strategy to take full advantage of opportunities, the shareholders are left with valueless shares if the building will be abandoned. Long-term goal setting is complicated in housing companies because the market lacks reliable indicators or indices that would unambiguously describe the techno-economic value of a housing company. A suggested *residential building condition index* would assess the technical condition of a building by taking into account implemented repairs and renovations, renovation in arrears, life-cycle management and costs, as well as energy efficiency factors. The index could be used in addition with other housing quality indicators to provide much-needed transparency for renovation market, which could then contribute to more rational decision-making. (P92, 63—64.)

The third development category of technology aims at tackling the stagnant technical practices. Keeping up with traditional practices and lack of development efforts have led to a situation where renovation processes have not been accelerated, productivity has not been improved, and clients' costs are rising. Developing *industrial methods and techniques for renovation* could increase renovation project cost-effectiveness, speed

and quality. Possibilities to transfer a part of renovation tasks into factories will improve when prefabricated apartment buildings built in the 1960s and 1970s reach the time of extensive renovations. The dimensions of these building elements are more consistent and industrial methods become more feasible. Applying prefabricated elements even partially in any construction site should increase productivity and shorten execution time. Industrial methods could also transfer risky construction work to take place in controlled factory conditions, and improve occupational safety and quality management. New methods for speeding the construction phase by coating the old pipes were launched already during IKE, which looked promising as they lessened construction activities in homes but on the other hand seemed risky because their life-cycle durability, manufacturing risks and the suitability for the Finnish environment were unknown and experience had not been accumulated yet. (P92, 69—70.)

The fourth development category of financing highlights the need for *individual financing alternatives*. The reason is that in many housing companies, decision-making slows down due to individual members' funding challenges. In the worst cases, large compulsory repairs force poorer residents, often elderly people with low pensions, to move out, or they tend to resist renovations in the fear of the situation. Municipalities should offer funding for renovations in housing companies, and ensure that residents with social and financial special needs are supported. In addition to public support, versatile individual financing should be tailored to fit a shareholder's life situation and support housing company renovations. That would enable updating of residential housing stock to meet the changing needs of the residents and to keep up with the developments at housing. It could have a long-term positive impact also in the municipal welfare service cost pressures as apartment buildings would serve larger variety of people, including enabling elderly people living in their homes as long as possible. Finding solutions to individual financing could be one of the most profitable financial issues in the national economy to be strongly developed. (P92, 70—71).

The last highlighted development issue of *developing customer-oriented practices for different parties involving repair construction* is not anatomised in the development requirements but actually forms sort of an umbrella that covers all the suggested developments. One of the related aspects involves the fifth development category about demand and resources that calls for provisions for the future wave of renovations. Repair construction lacked of skilled renovation professionals already in the early 2000s, and when adding up here the prolific increase in demand both by retirement and in growing renovation need, creates a difficult equation to be resolved. Solutions should be sought from efficiency-enhancing technologies, basic and updating training, taking into account foreign labor and expertise, and exploitation of retiring professionals as

senior experts and tutors for younger professionals. Customer service, improving the capacity at both corporate and personal level should be developed. Companies in the sector should continue organising staff training to create better customer experience. Also better-quality crafts-manship and capability to deliver finesse in outcomes should evolve. If resources would be centralised correctly and internationally attractive and competitive concepts would be launched, there could exist a market potential also in neighbouring businesses such as Russia's growing renovation market and could therefore improve Finland's international competitiveness. (P92, 72.)

The development requirements described above highlight the richness of perspectives in IKE with a collaborative preliminary study involving 67 multidisciplinary participants. While embracing multiple perspective, the main message that was highlighted in the final report involve a systemic change:

> "In order for the ageing buildings with flats to better meet the changing needs and requirements of different kinds of residents, the production-oriented renovation must give way to resident-oriented renovation and modernisation." (P92, 80.)

The same phrase was used in the press release and many public events where project results were presented. The breadth of challenges in renovations was apparent. Realisation of resident-oriented modernisation would require a cultural change at repair construction. Renovations should be acknowledged as a competitive business area in parallel with new building construction. It would need a new mindset to position the residents in the core of professional practices, and the residents should presume better result for their investment. The whole nation would need to awake to the issue and find new ways to tackle the complex issue. (I01—04; I47; I50—51; I56; I61—63.)

6.2 INTERPRETATIONS OF THE IDEAL VISION OF RESIDENT-ORIENTED HOUSING MODERNISATION

As was presented in the previous section, the ideal vision resident-oriented modernisation was handled in the IKE report as a complex socio-technical system but the vision was also left open for personal interpretation. Two years after the project was ended while conducting my first interviews for this dissertation, all 59 interviewees were asked about their interpretation on the meaning of the ideal vision. Here the interpretations are analysed according to three social groupings—residents, professionals and design researchers.

		RESIDENTS	PROFESSIONALS	DESIGN RESEARCHERS
FUNCTION		Interaction to incorporate residents' viewpoints equally in order to meet collective and individual residents' requirements.	Criteria for successful renovation projects where objectives, process and results meet the clients' needs.	Innovating housing renovations to a modern service business that apply industrialised solutions.
MEANING		Sense of ownership in the renovation process. Sense of community in the housing company.	Identity of a service provider. Sense of caring about people (residents) and the greater good (housing stock). Sense of hope.	Identity of an interpreter.

TABLE 6.3
The ideal vision resident-oriented modernisation interpreted by different social groupings.

The summary of the interpretations is presented in the table 6.3. Interviewees give both utilitarian interpretations such as professionals leveraging the human capital of residents in the renovation processes, and interpretations concerning identity and emotions such as residents reviving the community spirit at housing companies. Therefore, the ideal vision incorporates both design dimensions of function and meaning (Verganti 2009, 27). The basic message in regard to the function is rather same—to consider people and improve dwelling—but the interpretations of residents, professionals and design researchers emphasise different aspects especially when considering the meanings of the ideal vision.

6.2.1 Sense of ownership and community

From the residents' perspective, the ideal vision refers to an approach in which renovation is based in a hands-on housing company culture. That is, residents are active and self-directed in doing their part for the common housing company. This creates a healthy basis for conducting renovations in such a way that residents are actively affecting the process throughout the process, and professionals listen residents' various wishes and needs in all process phases. (I10—17; I19—20; I25; I27—28; I31—32; I35—37; I49; I52.)

In this interpretation, resident-oriented modernisation has the function of interaction to incorporate residents' viewpoints equally in order to meet collective and individual residents' requirements.

> "[Resident-oriented modernisation] Includes the assumption that the inhabitants will be significantly heard. Their views and opinion on how things are done and what is being done would be significant." (Dweller, shareholder, I52.)

"Residents get the best possible living conditions as cheaply as possible. The apartment should serve the purpose for which it was acquired. These renovations are distractions for normal living. Things which are deviations for the normal residential purposes, require planning—and the management of these occurrences." (Investor, I16.)

What is interesting is that these requirements do not only fall upon professionals but also include expectations for the resident community. Residents expect that the activities should be purposefully managed by people who are responsible of them (the board) and are being paid for the tasks (building manager and renovation professionals) but in a sense that all residents are aware of their activities and are able to have an impact (I17; I19—20; I32; I35; I49; I52). Moreover, residents think that resident-oriented modernisation relies on the housing company's and professionals' thorough understanding of the resident community, such as acknowledging the population's age division, individual wishes and financial situation, and include also considerations of greater societal issues such as city planning and environmental aspects.

"The housing company board takes into account the special needs and the human element within renovation. Are there the sick, the elderly, those requiring special arrangements in the housing company? In a way, supporting: 'how are you, have your things been taken care of, we are now in this phase.' There would be someone backing up and no one is left alone pondering how to organise temporary accommodation or such. The constructor is easier to start their work when the staircase is empty and they won't need to ring the doorbell: 'hey, you have not get your pets out'. It's about ensuring." (Dweller, shareholder, I49.)

The actual meaning behind these expectations is that residents interpret the ideal vision as offering a sense of ownership in the renovation process and sense of community in the housing company in general. Many residents think that basis for a good renovation project is a healthy housing company that is managed by people who care about the long-term issues, considers people, and has a good-spirited resident community (I10; I13; I17; I19—20; I25; I32; I35; I37; I49; I52). In this kind of a community people take care of their part as it is defined in the table of liability distribution (D135): if a resident should not be content with her housing, she should highlight the issue and tell about it to the housing company board and the building manager. The joint responsibility means that the whole apartment building is considered during

renovations and ensures that everybody's situation is taken into account. People are listened to during the planning phase and prepared for the execution phase early enough so that apartments would be emptied for construction work. That would require, for example, that old people are being helped to find a temporary dwelling and people are reminded to take care of their part. The joint responsibility refers also the ethos of the common maintenance bees (In Finnish "talkoot") where residents feel that practical doing together meets the mental feeling of collectivity (I10). Moreover, it means that things for the better of the community can be done without an explicit permission from the housing company board or building manager. People can, for example, keep the environment beautiful by raking leaves, planting flowers and lighting up candles during the holiday season.

On the basis of this kind of healthy and hands-on housing company culture it is easier to build renovation projects that are in any case a demanding process that requires lots of flexibility from residents. Whatever would be the technology or meaning of renovation, the process intervenes people's everyday life and extra attention is needed for the process. But if decisions are not forced and actions are not taken without a consensus at the housing company between the board and the residents, the process may become a journey where residents learn to know their neighbours better and the resident community becomes socially stronger. That requires a lot of reciprocal interaction within the housing company: the board needs to carefully inform residents on visions and plans, and the residents need to feel they are being heard. That is a process that is experienced as systematic and foreseeable, which builds trust among residents towards the housing company board.

6.2.2 Caring about people and the greater good

Repair construction professionals mutually agree that in resident-oriented modernisation residents' position in renovation projects is in central focus (I18; I21—24; I26; I29—30; I33—34; I38—44; I47—48; I50—51; I54—63). Following the idea, all residents in addition to the housing company board are representatives of the client who should be involved in the renovation projects. Renovation is a service process that should be customised according to the client and their wishes to find dwelling solutions that would support good everyday life.

> "Those who pay the costs and get benefits, are
> allowed to decide what renovation includes and when
> it's done and how to do it." (Planning manager Jarmo
> Halonen, I30.)

The clarity of activities and open communication are central factors in making the process fluent and to enable clients' ideas to be incorporated.

> "Resident-oriented renovation starts from the planning phase. It has clearly defined phases. The planning phase considers residents' various dwelling needs. The execution phase need is that informing is smooth and the process anticipated." (Building manager Anssi Timonen, I22.)

The function of the ideal vision is therefore being a criteria for successful renovation projects where objectives, process and results meet the clients' needs. The meaning of the ideal vision here is introducing a new identity of a service provider of a collective process instead of a mere technical act. The process continues to be managed by professionals who are now aware of how and where to involve residents. Residents do not need to take part in every step on the way but the process should have agreed milestones that define where residents' contribution is needed. Moreover, the service orientation assures that residents' opinions and wishes are incorporated in the process. Professionals consider in the planning phase what residents want, take care that the execution phase is systematic and foreseeable, and aim at an outcome that would please the client. It is about keeping the promises and meeting the plans. In the end, the success of renovation is evaluated by residents who live with the outcomes of renovation. That is, the new meaning brings about a sense of caring about people (residents) and the greater good by maintaining or improving the housing stock as the largest public property in Finland. (I18; I26; I30; I34; I38—44; I47—48; I50; I54—63.) Moreover, caring can make professionals proud of their actions and gives also meaningfulness to their daily work whether they would be involved in practical renovation work, communications or steering the system from within government (I60).

The ideal vision thus does not abandon the traditional objectives of meeting the schedule and cost estimate, and the quality assessment of the technical work being good, reasonable and expected (I21), but adds the new objective of service to generate good dwelling for particular clients.

> "Many times doing the right thing is just as cheap as doing the wrong thing, and residents have a lot to say about doing the right thing. Specifically what comes to such solutions that are economically equivalent but functionally quite different. Those are the things it'd be possible to look for in this [resident-oriented modernisation]." (CEO Ukko Laurila, I47.)

Focusing on the particularity of clients and contextual understanding of the projects reinitiates repair construction to a new approach to make business. The new business thinking acknowledges that resi-

dent-oriented modernisation is an instrument to generate good housing that both fits residents' needs and meets the technical demands. When all residents, stakeholders, are considered as clients, it transforms professionals' expectations because they start to assume that residents are active in initiating renovations and also in using resources for renovations. Residents launch projects, use their time in negotiating how to meet their wishes and needs, and also invest money for better service instead of choosing the one with cheapest possible cost. As such, it is a promise of better dwelling acknowledging that residents' individual alteration work are seen as a possibility to improving profit instead of a distraction. (I01—03; I05—07.)

Moreover, the ideal vision sparks a sense of hope because professionals feel they are able to make an impact to the complex system that used to seem unconquerable (I04; I47; I61; I63). It in a way improves the professional self-esteem by repositioning professional activity to a service. Focusing on people instead of technology opens a new perspective for repair construction that can be applied directly in daily practical work as well as long-term development in business and government.

6.2.3 An interpretative asset for repair construction

Design researchers' perspective on the ideal vision resident-oriented modernisation follows many interpretations presented above. The question for design researchers from a design university was however whether the field of repair construction was able to leverage their work particularly as interpreters who study and envision how people could give new meanings to repair construction (Verganti 2009, 116). Their interest was not that much on the content of the ideal vision but design researchers thought there was still much they were able to offer in innovating repair construction further. One of the main issues design researcher thought should be further considered was broadening residents' role, particularly within a business perspective. (I03; I09; I45—46; I53.)

> "The benefits and impacts should be assessed in the end customer's point of view and not only from the housing company's. When we go to the user level, also user's various incentives that seem to interfere the process from the industrial point of view become instead the essential elements of the process from the client perspective. [Resident-oriented modernisation] is a change in perspective, where the customer is considered more widely than just the housing company."
> (Professor Jarmo Suominen, I53.)

Qualitatively, this perspective was similar to Verganti's (2009) ideas on design-driven innovation: they did not consider residents as users but as *persons* who are involved in the renovations projects with all their *life*. Moreover, they were interested in the utilitarian and emotional *reasons* behind their experiences. (Ibid., 116.) Design researchers emphasised that all residents various everyday needs and wishes are listened to and carefully used as the foundation of renovation and for better solutions to meet residents' needs. But again it is not enough. Professionals have certain knowledge that is used for technical excellence with which residents' knowledge makes renovation context-specific. Design researchers saw that they could act here in between to generate new meanings for the relations in on ongoing learning by doing process that should continue beyond a single project. (I03; I09; I53.)

Therefore, the interest of these interpreters was not to simply observe residents to identify how the prevailing renovation process could be done better but in exploring how to redefine the purpose of repair construction, more or less radically.

> "Residents living in the house are taken into account when making renovations. Of course not in a way that they can prevent renovation or impact in such a way that work would be done poorly, but instead on how those things could be done better and more appropriate ways for residents." (Project researcher Riikka Rahtola, I09.)

> "There are so many roles people have. Some 'lift clutch' and [move out], they are not interested [in renovation]. Some wouldn't leave in any circumstances. Residents' roles are so diverse. Should it be called instead 'investor-oriented' modernisation, because then it would tell it is a question of money? 'Resident-oriented' tells that 'I live there'." (Research director Kimmo Rönkä, I03.)

In their interpretation work during the project and beyond, design researchers saw their contribution to be in applying their multidisciplinary knowing and capability to combine the residents' renovation experiences with other perspectives such as production, developments in business and strategic thinking. That is, instead of starting from scratch, their interest was in recombining different ideas together (Thackara 2005, 217—218). This is similar to a research-oriented design that is "exploring new possibilities, recombining others' findings, experimenting, identifying promising results, sharing them with others, exploiting their discoveries" (Verganti 2009, 115). Design researchers saw their role, also in the future when considering reinvention of the innovation (cf. Rogers 2003, 180—188) being interpreters who can apply the empathic under-

standing as a source of inspiration and broadened with other aspects in collaboration. (I03; I06; I09; I53.)

While continuing to play with the idea of residents' role in their work also beyond the project, the vision of housing modernisation was not taken as granted but questioned whether there should be another alternative form of services for housing companies that would consider the intensity of renovation among a vast variety of dimensions such as renovation, renewal, prepare, modernisation or updating housing where from to choose according to needs and desires (I03; I09; I45—46; I53). The ideal vision resident-oriented modernisation was thus a reference point from which they continued to make new interpretations.

6.3   ADOPTION OF THE IDEAL VISION
AS AN IDEA INNOVATION

The ideal vision resident-oriented modernisation with its varying meanings was adopted as an idea innovation (cf. Rogers 2003, 13) among the majority of people and organisations who were involved in IKE, and also raised awareness beyond the project participants in Finland relating to repair construction and housing renovations. As is illustrated in figure 6.8, 69 percent of the 59 interviewed project participants adopted the innovation within two years after IKE's ending. In total, 30 percent of residents, 88 percent of professionals and all design researchers adopted the innovation. When looking at the roles in the project, 30 percent of informants, 88 percent of workshop participants and 93 percent of project and steering group members adopted the innovation. (I01—63.)

The decision to adopt an innovation is a mental act, which needs to be followed with implementation to actualise the adoption. Implementation means putting the innovation into practice and overt behaviour change by using or reinventing it (Rogers 2003, 179), which is particularly important when the innovation is an idea only, that is, information that manifests itself in other forms (ibid., 13). 27 percent adopted the innovation by using the idea, while 61 percent of the implementation was actualised as re-invention, which will be discussed in detail in the next chapter.

Participants who adopted the innovation by using it, incorporated the combination of social and technical aspects together in their existing activities (I19—20; I22; I25—26; I28; I40; I52; I57; I62). Residents used the ideal vision in their replumbing projects, housing company activities or for personal benefit (I13; I19—20; I25; I28; I52). The housing company chairs in the middle of their replumbing applied their learnings to improve communications and information sharing at As Oy Planning and As Oy Construction (I19; I25). As Oy Construction compiled a list of residents' wishes for the constructor based on the user study and the user experience workshop. Also practical tips along the process were taken seriously such as focusing carefully on the final inspection where

residents' feedback and defects are gathered (I13; I20; I35; I49). One of the professional rejected the ideal vision professionally, but adopted it in her private life activities at the housing company where she was acting as an expert in the replumbing project (I62). One of the residents used the ideal vision for personal benefit as he decided to be proactive and hired an architect to design his bathroom to meet his needs (I52).

Beyond renovation, more interactive practices were also implemented in two housing companies in general. At As Oy Dwelling the housing company board took a more dialogic approach with residents and invested in small-budget improvements to improve cosiness such as painting the staircase (I27—28). An individual resident did not wish to attend the housing company board at As Oy Planning but he became a messenger by communicating residents' concerns to the board (I20).

For professionals, using meant applying practical learnings from the project and interactive approach in their work with residents (I22; I26; I40; I57; I62). One of the professional's work, in addition to developing repair construction practices, was to consult residents in their renovation projects where she started to emphasise communications, project planning, and early preparation following the systematic process aspect of the ideal vision (I23). She was also able to suggest practical tips such as making bathroom-specific blueprints. A building manager and a constructor said they started to emphasise communications in their work to make the process more clear to residents (I22; I26). Two architect applies the interactive method with residents by focusing on early discussion on needs and presentation of solutions (I40; I57). Also there

FIGURE 6.8
Adoption and rejection of the innovation resident-oriented modernisation within two years after IKE had ended.

Professionals

29%
59%
12%

Project and/or steering group members

7%
93%

ALL

Adoption: reinvention
Adoption: use
Rejection

Design researchers

100%

Workshop participants

34%
52%
14%

Residents

30%
70%

Informants

35%
65%
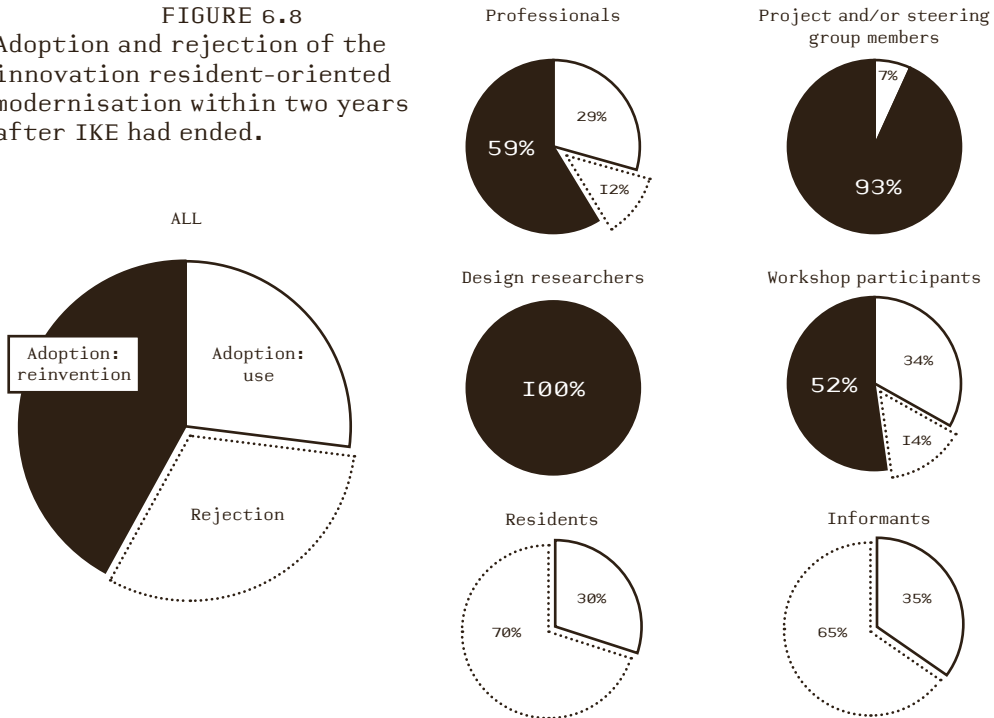
were experiments with the individual design of bathrooms to better meet residents' needs.

From those who rejected the innovation, 78 percent were residents whose roles and activities in housing companies or renovations did not change (I10—12; I14—17; I27; I29; I31—33; I35—39; I49). Some of them felt they were only informants in IKE and had not expected anything else (I14; I17; I32). Some others had given the meaning for the ideal vision of improving the sense of community in their housing company or having ownership in renovation that had not actualised (I12; I15; I16). Three residents were skeptical if the ideal vision would ever actualise, and thought instead the vision was a complete fabrication of imagination from start to finish (I17; I35—36). They felt that engineers only deceived residents to conduct renovation without a real technical reason. The cost frame, site procedures and the overall machinery of renovation did not seem as a system to be able to consider residents genuinely without a lot of financial investment from residents. Moreover, a resident raised the issue that there exists residents who may not be willing to attend renovations, which hollows the idea of resident-orientation altogether and vitiate it as an innovation (I15).

Based on the interviews in 2007, it could be summarised that residents *dream* of resident-oriented modernisation but *fear* that it is just a fabrication of imagination as they acknowledge what a complex change it would require to actualise. This scepticism goes back to the radical idea innovation that challenged the meaning of repair construction in such a deeply sociocultural level that it is difficult to imagine when being viewed from the everyday perspective (cf. Verganti 2008, 442). Among the professionals there was also scepticism to the innovation and accused that it was only a publicity act performed by the members of IKE. The rejecters also felt that it was unfair to accuse professionals who are doing their best in renovations because the real party in influencing the equilibrium resides in residents. (I29; I33.) The main connective factor among professionals and also residents who rejected the innovation was the feeling of being *powerless* in affecting the complex system of repair construction whereas those who adopted the innovation were able to *proportion the innovation* in their life and practices in such a way that it became useful and desirable.

7. The Ideal Vision in Repair Construction

After the IKE preliminary study, a considerable array of activities were initiated to implement change in Finnish repair construction through reinventing—interpreting and implementing—the ideal vision of resident-oriented modernisation. 42 percent of the project participants, that is, 25 repair construction professionals and design researchers from 14 organisations, applied the innovation to change repair construction processes in their organisations, and in development projects to introduce new services, practices and public guidelines so that the processes would incorporate residents and the aim at modernising the built environment (103—63).

7.1 DEVELOPMENTS FOLLOWING THE IDEAL VISION OF RESIDENT-ORIENTED HOUSING MODERNISATION

The ideal vision of resident-oriented modernisation highlights a change of focus from previously prioritised technical aspects emphasising schedule, costs and execution to consider the resident perspective as a focal aspect in renovation of apartment buildings, and particularly housing companies (I21). Particular themes respectively, as depicted in figure 7.1, characterised progress and public discussion about repair construction in the following years after IKE. The first main theme that outlined the overall discourse in the field considered *focus on all residents* meaning that also other residents—shareholders as dwellers and investors and dwellers who own or rent the apartment—beyond the official decision-makers in the housing company board are to be considered in renovation projects. As a consequence, residents became an interesting subject. Their stories were told in media, new practices were developed to establish rapport, and the agenda got political support. The raising awareness of resident-oriented modernisation also supported "real estate and housing industry's shared vision of the housing market as performing for the good of residents" (D051, 6). IKE had in this progress an important role as a preliminary study that was able to "explain how renovations should be handled from the resident point of view in words of one syllable" (I55) and as such gave a crystallised point of reference to developing repair construction and also more broadly for real estate and construction industry. (D001; D003; D006; D012; D046—047; D051; D118; I01—08.)

FIGURE 7.1
Thematic depiction of the progress and challenges in repair construction in regard to the ideal vision resident-oriented modernisation.

FOCUS ON ALL RESIDENTS

REPLUMBING IS SERVICE BUSINESS

NEED FOR LONG-TERM MAINTENANCE CULTURE

Communications is the key to interaction

Need for a multi-disciplinary approach

Renovation is the momentum for improving housing stock

TOPICAL ISSUES CHALLENGING THE INNOVATION
1. Public demand for cheap and easy fix
2. Requirement for energy-efficiency
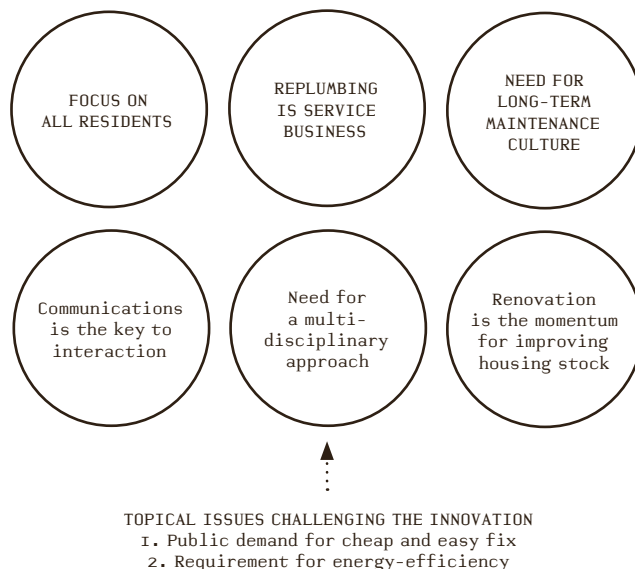
Many of the development requirements that had been presented in the IKE final report (P92, 62—72) demanded extensive measures to be solved, but repair construction desperately needed also means to quickly improve its practices and weakening reputation. For this was presented the view that *communications is the key to interaction* that practically permeated all development and solutions that followed the innovation. Communications was one part of the IKE preliminary study, and it was one of the following developments that were persevered with the most (D020; D025; D034; D075; P92, 57—60). Even though it was a new aspect for repair construction, it quite easily improved the service capability when was applied even remotely, and was therefore widely applied in the system to smoothen practical renovation projects, to turn replumbing into service business, and also to raise public awareness of the basics of repair construction. (D009; D013—014; D017; D020; D025; D037; D046; D047; D069; D075; D078; D099; D127; I01—08.)

Acknowledging residents in housing renovation made professionals quickly understand that *replumbing is a service business* instead of a technical act, which became the second main theme of progress in repair construction. Reinitiating the field offered opportunities to distinct and extend business offering for example by productisation of services for different types of renovations (D013; D039; D099; D100). By broadening the scope of repair construction with service orientation therefore meant projects could not be executed anymore among technical professionals but there was a *need for a more multidisciplinary approach*. According to interviews (I01—63), the quest for a more multidisciplinary approach eventually added communications to complement service offering and applying existing services, such as condition survey, also to housing renovations. The limit for organisations and professional practices to change was found here in regularising resident-oriented modernisation to services that rests upon communications and technical knowhow instead of exploring more wide applications, for example, in regard to well-being and coping at home that were originally highlighted in IKE. (D040; D042—043; D069; D098; I01—08.)

While professionals started to put focus on service-orientation and to demand more research and development on housing and construction, residents also started to activate. An unexpected consequence of raising general awareness of residents' role in replumbing and housing renovations was that as residents became more active, there raised *public demand for cheap and easy fix* for renovation. In consequence, the professional field polarised between those who answered to the new demand by offering alternative methods that lowered the costs and shortened the construction time, and those who underlined the professional responsibility to apply only the informed and sustainable solutions whose consequences are known. By 2011, there had been published research that justified alternative methods, which helped to find balance in hybrid

methods according to which each renovation target is designed as a unique combination of traditional and alternative techniques that fit the technical need. (D037; D046; D047; I01—08.)

Another issue that challenged the ideal vision resident-oriented modernisation was the sudden *requirement for energy-efficiency* regulated in EU directives and national legislation that increased the degree of difficulty especially in housing company renovations (D106; D116). There were now two difficult problems—resident-orientation and energy-efficiency—for repair construction to solve and professionals needed to figure out what to prioritise. Both aspects were regarded important considerations in the governmental level of the system, and the ministry along with many enlightened professionals saw them part of the idea of housing modernisation. The real problem was more likely that renovations could not be executed without further consideration anymore. Consequently, the third main theme was a *need for long-term maintenance culture* that would ensure different individual, financial, societal and environmental interests would be satisfied. Following the idea of housing modernisation, professionals started to see *renovation as the momentum for improving the housing stock* when it was feasible to invest to required improvements such as energy-efficiency and updating the living conditions at the apartment buildings that represented the living standard of the mid-20th century. Improvement of the housing stock that served both requirements was seen as the means to attract residents to invest in renovations. (D001; D006; D106; D115—118; I01—08.)

In practice, the IKE participants were involved between 2005 and 2011 in interpreting and implementing fifty reinventions that followed the innovation resident-oriented modernisation (Fig. 7.2). These reinventions included research and development activities for the public good and business. The public programmes and R&D projects, and public solutions such as TV-series, a book and an assessment tool, as well as R&D for business development, and introduction of new services and marketing that followed directly the innovation and represented second generation development are described in detail in the following sections (D004; D007—009; D014; D017; D019; D025; D034; D039; D046—047; D055; D058; D060; D067—068; D078; D090—091; D097; D101; D111). Development of guidance and solutions for government guidance cannot strictly speaking be defined as direct reinvention because the ministry was in the process of definition of policy in regard to repair construction due to the societal trends already at the same time when IKE was initiated and continued systematically in the following years (D001; D006; D023; D044; D050; D063; D065; D074; D079). Even though these developments were not initiated due to the project, IKE facilitated public development. Therefore government development was an inherent part of IKE related activities in implementing change at repair

RESEARCH AND DEVELOPEMENT

STUDIES

GETTING A LIFT
Experience of retrofitting lifts

ASTAR
People's needs for transportation

INSERT
New service models for repair
construction

FUTURE OF BUILDING MANAGEMENT
Service capability of building
management

PROGRAMMES

IKE
Preparation of the national programme
for resident-oriented housing modern-
isation, not realised

BETTER HOUSING 2010
National programme promoting Finland
as an exemplary country of housing

LIVING BUSINESS CLUSTER
National programme for housing
business activities

TEE PARANNUS
Communications programme to
develop and promote practices of
user-centred, systematic, cost and
energy efficient renovation

DEVELOPMENT
OF GUIDANCE

KORVO
Guidance system for repair
construction

HOUSING COMPANY STRATEGY
Guidelines for defining a strategy
for a housing company

R&D PROJECTS

IKE-PPP › ASPE
Preparation of R&D on personalised
housing modernisation, not realised

IKE-VAP
Preparation of R&D on communications
for resident-oriented housing
modernisation, not realised

IKE-ASKO
Bundle of developments on management
of resident-oriented housing
modernisation process and related
communications tools

PROFIT FROM CHANGE
Facility management to adapt changing
situations

24 LIVING
Value networks for housing business

365 WELLBEING
Preparation of WDC Helsinki project
to e.g. revitalise suburbs

SUBURB 2072
Preparation of R&D on collaborative
suburban development

PUBLIC

BUSINESS

R&D PROJECTS

IKE-PAP
Service models for resident-oriented
housing modernisation

RENOVATION PROJECT PLANNING
Business models for housing
renovation

RESIDENTIAL MANAGEMENT
Information flows between the housing
company and residents

KEKO
Sustainable renovation

LÄHIÖHARMONIA
Service model for facilitating repair
construction in the suburban scale,
company project part of Suburb 2072

FIGURE 7.2
Fifty developments following the innovation resident-oriented
modernisation that the IKE participants were involved with between
2005 and 2011. Developments in boxes are direct reinventions and
others applied ideas of the innovation.

SOLUTIONS

PUBLIC

TV SERIES

RESIDENT-ORIENTED REPLUMBING
Document series of a resident-oriented replumbing project

RESIDENT-SERVING REPLUMBING
Document series of the largest replumbing case in Finland

SEMINAR

OPPORTUNITIES OF RENOVATION
Open seminar series for residents and professionals in 22 cities

AWARDS

HOUSING ADVOCATE
In 2005, the award was nominated for promoting housing renovation

HOUSING COMPANY ACT
In 2008, the award was nominated for introducing a replumbing service

BEST REPLUMBING
In 2008 and 2010, the award was nominated for resident-orientation, communication and systematic process

QUALITY INNOVATION
In 2010, the award was nominated for a replumbing service

BOOKS

MANAGEMENT AND COMMUNICATIONS
Management and communications at housing company renovation project

GUIDELINES FOR REPLUMBING
Guidelines for replumbing project at housing company

GUIDELINES

REPLUMBING BULLETIN
Basic information on renovation and repair

MAINTENANCE OF RESIDENTIAL BUILDINGS
Use and maintenance guidelines for residential buildings

WEBSITES

TALOYHTIO.NET
Information, products and services on renovation for housing company boards, building managers and residents

KORJAUSTIETO.FI
Information on maintenance and renovation of homes and housing companies

ASSESSMENT TOOLS

CONDITITION CERTIFICATE FOR HOUSING COMPANIES
Illustrating the technical condition of real estate

REPLUMBING BAROMETRE
Status of plumbing renovation projects in housing companies

GOVERNMENT GUIDANCE

STRATEGY FOR REPAIR CONSTRUCTION
The national strategy for maintenance and renovation of the existing built environment between 2009 and 2017

GOVERNMENT RESOLUTION FOR REPAIR CONSTRUCTION
Governmental decision on the strategy for repair construction

ACTIVISM

FINLAND'S HOUSING COMPANY SHAREHOLDERS´ ASSOCIATION
Promoting apartment owners' role in housing companies

BUSINESS

SERVICES

PLUS SERVICES
Resident-oriented housing company services for replumbing, facade renovation and maintenance

COMMUNICATIONS
Additional service for renovation

RENOVATION PROJECT DIRECTOR
Additional service for renovation

REPLUMBING TRAINING
Basic training on frequently asked questions on renovation

PLUMBING CONDITION SURVEY
Additional service for renovation

HOUSING COMPANY RENOVATIONS
Resident-oriented replumbing

ANNUAL TECHNOLOGY REVIEW
Review on housing technologies from the client perspective

COMPREHENSIVE SOLUTION FOR RENOVATIONS
Including survey, planning and implementation

MARKETING

REPLUMBING LEAFLET
Guidebook for replumbing in a housing company

COMPREHENSIVE SOLUTION FOR RENOVATIONS DVD
DVD presenting the largest replumbing case in Finland

construction that is also described as part of commitment to continuous development in the following sections.

In addition to the above mentioned reinventions, according to the interviewees there were 22 reinventions that more or less applied the ideas of the ideal vision. *Studies* on retrofitting lifts, service models for repair construction and service capability of building management in the future were initiated by the IKE partners to elaborate aspects of repair construction (D027—028; D037; D076; D083; D096). Other R&D included the *programmes* Better Housing 2010 and its follower Living Business cluster where Finland was promoted as an exemplary country of housing and housing business including also the existing housing stock (D002—003; D051; D062; D079). These were larger societal initiatives for improving the quality and competence of the real estate and construction industry with whom the IKE participants allied and that applied the ideas of resident-orientation also from the project (I01—09; I42; I50; I61; I63). Three companies beyond IKE partners applied the ideas they had learned in the synthesis workshop and collaboration to improve their service offering of renovation project planning and residential management (D013; D020; D054; D059; D075). Additionally, there were *R&D projects* to develop means for facility management to adapt changing situations and to explore value networks for housing business and a study on people's needs for transportation. These did not relate to repair construction but instead some IKE participants applied ideas of user-centred and collaborative approach in their projects in other fields too (D011; D015—016; D029—030; I03; I09; I42; I45—46; I53). (I01—08; I47; I61; I63.)

Following development investments, 14 different indirect solutions were introduced within six years after IKE had ended (D005; D012—013; D020—021; D031; D036; D040; D042—043; D045; D057; D069; D072; D085; D102). While in a smaller construction company resident-orientation was applied directly in housing company renovation projects, a large construction company invested to development to stand out from other service providers by clarifying the previously fuzzy renovation with a sophisticated process model that emphasised communications and were supported with down-to-earth *marketing* (D013; D020; D072; I26; I44). In addition to renovation activities, new twists in *services* included also an annual technology review that started to emphasise review on technologies also from the client perspective based on the learnings in IKE (D057; I24).

Public solutions included an open *seminar* series for residents and professionals that was organised to promote opportunities of renovation, a *book* to provide guidelines for replumbing at a housing company, basic *guidelines* on renovation and repair, and a *website* to share information, products and services on renovation for housing company boards, building managers and residents (D005; D012; D021; D085; I47; I55; I58). In parallel with these, there were also other activities aimed at raising the

general awareness of housing renovation in general and resident-orienta-tion in particular that arose, such as books about systematic replumbing and resident's survival guide during replumbing, and a website by the leading Finnish multi-channel media company to offer information on issues related to housing companies (D022; D024; D026). These were mentioned in the interviews to describe the overall growing interest toward the subject of resident-oriented modernisation that had been promoted over the years; for example, by nominating several *awards* for resident-oriented modernisation with particular focus in communications and introducing replumbing barometer as an biannual *assessment tool* for housing companies to evaluate the status of replumbing in Finland (D031; D040; D042—043; D069; D102; I01; I05; I56). All these developments were professionally initiated and led in order to serve residents better but in such a way that the control remained among professionals. There was one particular initiative that represented an attempt to give more voice for residents with their own terms, as some professionals decided — based on unfortunate experiences in their housing company's renovation project — to establish an association to promote apartment owners' rights in housing companies (D036; I05). This *activism*, in addition to the public demand for cheap and easy fix in renovations, were the first signs of residents taking active role besides professionals in implementing change in repair construction.

The following years involved active and versatile development among the IKE participants. It could be argued that most of the indirect reinventions were developments that would have probably occurred without IKE or the innovation because they are related to a bigger societal cause to deal with the growing volume of renovations. The technical fact that apartment buildings must be renovated would not have changed but according to the interviewees presumably the objec-tives, contents or means would have been different without IKE and its ideal vision because it provided means in raising awareness of the cause for housing renovations in general, and resident-orientation and modern-isation in particular (I01—I09).

7.2 MOTIVATIONS FOR IMPLEMENTING CHANGE IN REPAIR CONSTRUCTION

Reinvention of the innovation resident-oriented modernisation with the fifty aforementioned projects and solutions denotes implementing change at repair construction. Through reinvention, the vision presented in the final report (P92) did not remain an idea but became materialised in public and business solutions, and increased development at repair construction. Although the diffusion rate in the entire field is out of the scope of this study, it is apparent that reinvention helped to diffuse the innovation beyond the 67 participants in the entire Finnish repair construction field that employs roughly 150,000 professionals in the

construction sites, industry, services and commerce, and meddle residents' everyday life in 15,000 to 20,000 apartments yearly (D116, 9; D118, 17). Therefore, activities for reinvention fulfilled the original objective of IKE as a preliminary study to induce development at repair construction through finding meaningful issues for future appropriation in improving the field beyond the project.

Reinvention was thus the constitutive factor in systemic change instead of a sign of a weak innovation as has been claimed by, for example, diffusion scholars (Rogers 2003, 179—188). In regard to collaborative design, future appropriation in organisations or within other more complicated realities is the fundamental aspect in identifying successful design (Björgvinsson et al. 2012; Buchanan 2008; Buur & Matthews 2008). If innovations as more or less open-ended proposals (Verganti 2009) are not appropriated beyond design activities in projects and other forms of development, there will not happen systemic change with design. Collaborative design was thus successful in IKE because it facilitated in generating the ideal vision resident-oriented modernisation as an adopted starting point for change that was implemented through fifty different developments.

In the following, I describe how 42 percent of the interviewed IKE participants found motivation in implementing change while others did not by analysing the individual innovation-decision processes based on Rogers' five stages model of innovation-decision process (Rogers 2003, 168—192). All 59 interviewed participants passed through a decision-making process that resembles the stages in Rogers' model. However, the process was partly different due to the characteristics of the innovation resident-oriented modernisation as a purposeful starting point for change instead of a solution that is primarily aimed for appropriation in use (Fig. 7.3).

In the first *knowledge* stage, the IKE participants became aware of the combination of social and technological aspects in regard to repair construction or the built environment in other ways. If this awareness rose before the project, typically it involved generating a parallel innovation that had incorporated both technical and social concerns. Here, *persuasion and decision*, are combined to the second stage that involved making a choice to adopt or reject the innovation that occurred at the same time as the ideal vision was created in the project. With the kind of retrospective research material this dissertation is based on, it is actually impossible to analytically separate the acts of persuasion and decision but they seem to intertwine. The innovation-decision process was supported with trying out the idea for example in workshops. The third *implementation by use* stage was about applying the ideal vision in practical activities, namely emphasis in resident-orientation. Practically speaking, use always involved some sort of reinvention because the ideal vision introduced a new approach that did not exist before but it is here interpreted as use instead of reinvention, if it was individual activity

INNOVATION-DECISION PROCESS RESULTED IN	IN RELATION TO THE IKE PROJECT			ACCORDING TO ROLES IN IKE		
	Before	during	after	Project and/or steering group members	Invited participants	Informants
REINVENTION Confirmation for the innovation, and continuous adoption by reinventing it				●●●●● ●●●●○		
Confirmation for a parallel innovation, and adoption of the innovation by reinventing it				●●	●●○	
Adoption of the innovation by reinventing it				●●○	●●●●● ●○○	
USE Adoption of the innovation by use				●	●●●	●○○○○ ○○
REJECTION Rejection of the innovation but confirmation for a parallel innovation					●●●● ●	●
Rejection of the innovation					●●● ●	●○○○○ ○○○○○ ○○○○○

FIGURE 7.3
Representation of six types of individual innovation-decision processes among the interviewed IKE project participants.

Legend:
- ☐ I. Knowledge
- ▦ II.–III. Persuasion and decision
- ▨ IV. Implementation by use
- ■ IV. Implementation by reinvention
- ▧ V. Confirmation

- ● Professional
- ○ Design researcher
- ◌ Resident
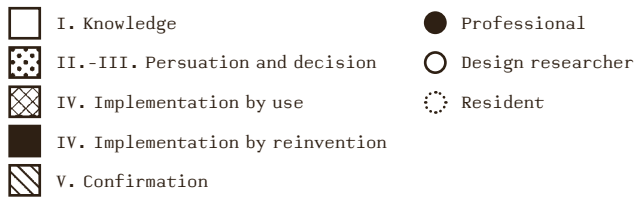
that did not even try to affect the repair construction community more widely. The fourth *implementation by reinvention* involves all the aforementioned fifty activities to interpret and implement the innovation resident-oriented modernisation that generated systemic change in repair construction. The fifth *confirmation* stage is about consolidating the decision, often by pronouncing the adaption publicly and therefore promoting the ideal vision. In this connection, this stage had two main purposes: acquiring confirmation to a parallel innovation that supported some other activity similar to the resident-oriented modernisation but possibly in another context, and reasserting the innovation resident-oriented modernisation as a transitional period to strengthen commitment for reinvention. (I01—04; I09—63.)

As depicted in figure 7.3, there were six distinctive innovation-decision processes among the interviewed IKE participants, which I have named after the result of the process (I01—04; I09—63). These individual processes proceeded in differing time-scales starting already before the project kick-off or along the project activities, and continuing beyond or ending within the project constraints settling on reinvention, use or rejection within two years by 2007.

Two types of rejection represent project participants who made a decision to not to implement the innovation by use or reinvention. The type *rejection of the innovation* was the most typical single decision made by 18 project participants (I10—12; I14—17; I27; I29; I31—33; I35—39; I49). None of these residents and professionals had prior involvement in regard to combination of social and technological aspects or development of repair construction. Four of these were professionals who attended an IKE workshop only once and did not find motivation for changing their practices because they did not see any relation to their work (I29; I33; I38; I39). Rejecting residents included those who attended the IKE events only once (I10—12; I14—17; I27; I32; I36) but also people who were involved in the whole user study process but did not have an official role in their housing company and therefore felt that they were not able to apply the innovation in their community (I31; I35; I37; I49).

The second type is comprised of professionals who ended up with *rejection of the innovation but confirmation for a parallel innovation* (I23—24; I41; I43; I59). These professionals were known to be lead-users using parallel innovations in their practical work and therefore were invited to join the IKE events to share their insights. The variety of parallel innovations included a communications process model and related tools at rental housing, a presentation kit that aimed at persuading housing companies to retrofit an elevator by showing consequences with visualisations of alternative solutions and apartment-specific cost sharing, and emphasis on client perspective in research (I23—24; I59; D086). One of them called housing renovations a form of social building due to working in close proximity to people's lives (I43). Following the social understanding, some had developed detailed practices and sensitivity in their building management, planning, consulting and constructing business to fulfil their professional purpose to service all residents, which was realised in their interactive practice as a building manager, and in planning, consulting and constructing business (I41; I43). These rejecters did not have interest or opportunity to continue development but, instead, acquired support to their way of working.

The third type of innovation-decision processes *adoption of the innovation by use* is the first type describing reinvention. The main connective factor for these adopters was the perceived need to find a way to deal with renovations even though only two of the eleven adopters had lead-up knowledge on the user-centred approach (I13; I19—20;

I22, I25—26; I28; I40; I52; I57; I59; I62). Residents wanted to affect the renovation process and its results, or the resident community in general, and the ideal vision gave them justification to act according to their aspirations. Residents were housing company board members or otherwise active residents who started to emphasise interaction and communications in their housing companies (I13; I19; I25; I28). One resident started to be his own activist and hired an architect friend to design his bathroom to find a solution he would be satisfied with (I52). An external member in the steering group ended up in professional rejection of the innovation but adoption in personal life by use (I62). She had been invited to join in the group to provide insights based on the ongoing renovation project at her housing company. Her professional work did not relate to the subject but she became an expert in her dwelling community. Other professional had been involved in renovations and knew how difficult it is sometimes to manage the social processes, for which the ideal vision gave a perspective and also practical tips during the project activities and in the final report but did not have a position to seize the moment and contribute to development (I22; I26; I40; I57).

The fourth type is *adoption of the innovation by reinventing it*, and makes the first group of the IKE participants who contributed in implementing change at repair construction. Half of the eleven adopters had lead-up knowledge on the user-centred approach (I09; I21; I30; I34; I42; I45—46; I48; I54—55; I58). This is the first group including also design researchers. They saw the ideal vision in line with their professional knowledge and objectives in general; for them, the innovation resident-oriented modernisation was another construction of user-centred design, yet radical in that application to repair construction had seemed almost impossible, and a central achievement in IKE was then to find workable ways to apply user-centredness in the field and to convince the professional actors that socio-technical balance is worth pursuing (I09; I45—46). All professionals, whether they were the IKE project group members or invited participants in workshops, were middle managers or executives who had a possibility to use their working hours for development and to affect their work content (I21; I30; I34; I42; I48; I54—55; I58). They became highly motivated by the realisation of residents' role in renovation projects and found the ideal vision resident-oriented modernisation meaningful in regard to perceived challenges and anticipated opportunities respectively.

The fifth type was comprised of professionals and a design researcher whose innovation-decision process resulted in *confirmation for a parallel innovation, and adoption of the innovation by reinventing it* (I18; I44; I51; I53; I60). This dual relation with the innovation was based on earlier work to innovate practices for repair construction in ways that resembled the innovation resident-oriented modernisation. They thought that the built environment and technology within were a tool to serve

human needs. The human-centred approach for technology included a variety of topics such developing housing renovation business in a large construction company, state subsidies and life cycle management of real estates, thorough consideration of interaction measures in each renovation project, and applying mass customisation in the construction business. The connective factor among these adopters is relative distance from IKE: one of them was a project group member and another a steering group member but both of them attended meetings only in the beginning of the project, while other three adopters only attended the synthesis workshop. They are all in positions where their responsibility is to develop business and practices, and their own professional agenda in which the ideal vision resident-oriented modernisation fit. The vision generated in IKE was justified with residents' renovation experiences, and provided a novel, well-defined criterion for continuing their work with reinvention based on their parallel innovations.

The sixth type is comprised of people who created the original idea for IKE, and were consistent in *confirmation for the innovation, and continuous adoption by reinventing it* (I01—04; I47; I50; I56; I61; I63). These professionals and a design researcher represent the most committed people who had been able to link their personal and organisational values with the ideal vision through the collective making during IKE. This started during the project preparation and commissioning process, during which their knowledge was incorporated into the project idea. The main decisions in regard to combining social and technical aspects, and the main principles of the ideal vision at the same time, were thus made already before the project had been launched. The great advantage was that the project planning group comprised of experienced professionals who together had a unique vantage point to trends at repair construction and understanding that something else than repeating the familiar project receipt was needed in order to come up with an innovative starting point for the future developments. The professionals and design researcher were also experienced in research and development projects and visionary people who knew how to make good use of a project by building on previous work and to capitalise promising ideas into following development work. They had the development mindset from the beginning and organisational resources to realise the plans.

Since an innovation-decision process typically requires lot of time, sometimes many years or even decades (Rogers 2003, 15), probably the fact that 55 percent of all adopters, and 80 percent of those who invested in reinvention, had prior related knowledge on the combination of social and technical aspects before the project, affected the rate of adoption (I01—04; I09—63). On the contrary, all those who rejected the innovation had not gained knowledge of the combination of social and technological aspects before IKE—of whom 78 percent were residents (I01—04; I09—63). For the adopters, the socio-technical issue embodying

the innovation resident-oriented modernisation was not totally new even though the framing or the context was different to their prior activities. It seems that as early involvement is said to increase adoption (Rogers 2003, 174), the preceding understanding also improved motivation to participate in IKE. During participation they also built motivation for implementing change in repair construction as they became committed to the ideal vision and found personal meaningfulness in it, especially if they knew they had resources to invest in development.

This analysis shows that IKE was a sort of an innovation diffusion process for its participants (Rogers 2003, 11), by which the ideal vision resident-oriented modernisation was communicated within and during the project process among the participants. The best adoption results were gained through intensive participation in the project as members of the project and/or steering groups (cf. column *According to role in IKE*, Fig. 7.3) and early involvement with the development subject already before the project had been launched (cf. column *In relation to the IKE project*, Fig. 7.3). Reinventors built commitment to the innovation and found personal meaningfulness in it through participating in the project. The weakest adoption result occurred when the adopters acted as informants in the project (cf. column *According to role in IKE*, Fig. 7.3) and had no prior knowledge on the subject (cf. column *In relation to the IKE project*, Fig. 7.3). In regard to facilitation of events, invited participants who ended up reinventing the innovation form an interesting group. In attending one event, the synthesis workshops, they found a connection between their professional practice and the ideal vision and contributed to change. It was a matter of ownership: the more the participant felt she was a visitor on someone else's turf in the project (i.e. competitor), the less commitment was built to the ideal vision, while for the most advanced adopters, the type six, IKE was actually a means for continuous development, a project among others that was used for improving repair construction or design research.

7.3   THREE MAIN STREAMS OF DEVELOPMENT FOLLOWING THE IDEAL VISION

Within the years following the IKE preliminary study, some repair construction professionals placed considerable temporal, personal and organisational investments in reinvention of the innovation resident-oriented modernisation. These committed people put their resources at use in order to actualise the ideal vision of repair construction. In reinventing the innovation, they applied their learnings from the project where they had gained novel insights from reciprocal empathic encounters with residents and holistic exploration of an alternative future for the field.

There were three main development streams that involved reinvention of housing renovation service business, preparation of national R&D programme and guidance for repair construction as

depicted in figure 7.4. All three development streams are closely related to involvement in IKE, during which commitment to the ideal vision was built (Soini & Keinonen 2011a). If the development streams are viewed with the lens of the conditions of commitment (Pfeffer 1981), it can be seen that these conditions are filled among the most committed people. The first condition *choice* (Pfeffer 1981, 291) actualised in that the development streams were led by people who had launched IKE. They had decided to influence the developments at repair construction based on the perceived challenges and anticipated opportunities already before the project. By making a choice to launch the project, they took ownership to the cause and established the foundation for commitment to the ideal vision. *Publicity* was originally used as a practical tool to raise awareness for the shared agenda, to promote resident-oriented modernisation and to persuade repair construction professional and residents to the change, but it also became the second condition (Pfeffer 1981, 292). At the same time, they built up commitment towards similar actions in the future due to having announced their commitment in public. They became opinion leaders who promoted resident-orientation and modernisation of the existing built environment. The third condition *irrevocability* (Pfeffer 1981, 292) was a consequence of other actions: as those who invested in reinvention had changed their behaviour according to resident-oriented modernisation, they became advocates of the innovation that again reinforced their commitment.

Figure 7.4 also illustrates the timescales of the developments as a description of commitment to systemic change. There are only two developments, the strategy working group and the condition certificate, that continued the preliminary study work immediately. Next formalised major steps, R&D projects IKE-PAP and IKE-ASKO planned to be part of the national IKE R&D programme, were taken not until 18 months after the preliminary study was finished. The R&D programme was built for three years before it was deemed to end preparation without results. The second stage developments, such as guidance development Korvo, R&D project Keko and communications programme Tee parannus, were launched approximately three years after the preliminary study finished. Within the timescale of this research, there was also started the third stage of development such as developing a housing company strategy as part of the guidance for repair construction and new development projects Suburb 2072 and Lähiöharmonia on dealing with renovations in suburban scale. By 2011, systemic change had proceeded with three stages, all separately working for the common good.

To illustrate the broadness of scope and largeness in scale (Carr-Chellman 1998, 372) of the systemic change of the complex system of Finnish repair construction towards resident-oriented modernisation, and the role of collaborative design in it, this final empirical section tells the story of the most committed people and their actions for change
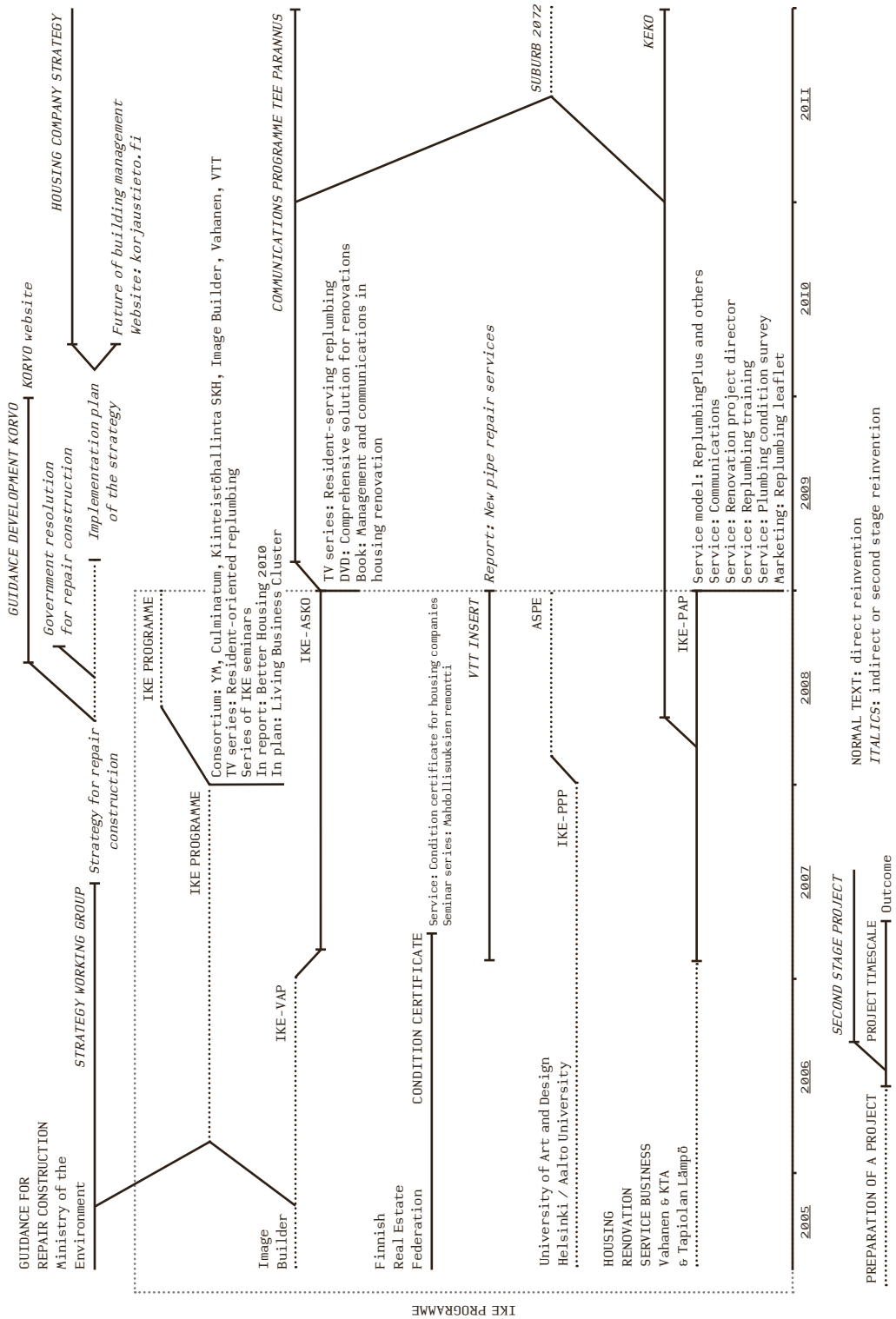
FIGURE 7.4
The three main streams of development following the ideal vision
of resident-oriented housing modernisation.

within the main development streams. These three streams involve redefining the criteria of repair construction with resident-orientation, continuous investment in developing service offering at a company, and incorporating the ideal vision resident-oriented modernisation in the Finnish building policy. The following story, which elaborates the six innovation-decision processes presented above, supports other research on collaborative design showing that it is indispensable to invest in commitment building to improve involvement and appropriation (Braa 1996; Brandt 2007; Den Ouden & Valkenburg 2011; Dervojeda et al. 2014; Keinonen et al. 2013; Lee 2013; Sleeswijk Visser 2009). Moreover, the following story highlights that the focus on commitment building in collaborative design should be on identifying and supporting stakeholders' motivation for participation in a collaborative project, and motivation for implementing change beyond the project activities in order to facilitate systemic change with design.

7.3.1   Resident-orientation as a convivial criterion for repair construction

The development stream that concerned the most diverse activities and commitment of organisations was built around preparing the *national IKE programme*. This originally planned continuation for the preliminary study is depicted in figure 7.4, involving all the official partners from the preliminary study—the ministry, Vahanen, Image Builder and the design university—as well as Real Estate Federation having held the chairmanship. Only one organisation from the steering group, the Housing Finance and Information Centre of Finland having an occasional attendee, did not continue development based on the ideal vision at all (I51).

This section takes a perspective of the main character in this development stream, CEO Juha Salmi (I01; I06), who revitalised repair construction development with considering residents as a new, convivial criterion. Salmi represents those reinventors who were the most committed to the ideal vision. He, along with project manager Jouko Taskinen from Image Builder and chairman of the board Risto Vahanen, had originally initiated the IKE preliminary study, and continued the work persistently to prepare the IKE programme as a continuation of the preliminary study.

The following describes also activities and commitment to development of three organisations, Image Builder, design university and Real Estate Federation, whereas activities by Vahanen and the ministry are described separately in the following sections. People in these three organisations represent the two most advanced types of innovation-decision processes (cf. Fig. 7.3): three of them are repair construction professionals (I01; I56; I47) represent type six as they had been involved in preparing the preliminary study and gained confirmation for the

innovation resident-oriented modernisation, and continued their adoption by reinventing the innovation, and two design researchers (I09; I53) represent type five as they gained confirmation for a parallel innovation—user-centred approach in the built environment—and adopted the innovation by reinventing it. All of them had been involved with developing repair construction or user-centred practices before the project and held positions, in which they were able to invest to reinvention.

Preparation of the IKE programme followed the original idea that in IKE would be a three year research and development project that comprises of three iterative phases preliminary study, development of the user-centred IKE process, and testing the process (P03), but now the programme was planned as a more extensive version based on the more complex problem that was defined in the final report and summarised in the table for development requirements, project and themes (P92; P93). Salmi and Taskinen (I01; I56) started the preparation by organising seminars part of important professional events to disseminate the preliminary study results, to present the IKE programme and to build the consortium in order to launch the programme (D017; D045; D056; D088). The first formulation of the common IKE programme was launched in seminar in 2006 (D056), in which the title IKE was used consistently to identify activities as it had become a brand that symbolised for many "IKE good news" (I01). In the planned programme, research project *IKE-PPP* by Future Home at the design university stood for personalised housing-modernisation (D008, D019), development project *IKE-PAP* by engineering company Vahanen stood for service models (D014), and cooperation project *IKE-VAP* by Image Builder stood for communications (D017). The development of the *condition certificate for housing companies* was included as one of the partner projects because the original idea of technical index for housing companies was created in the preliminary study (D004; D051, 20—21; P92, 64). Development of this certificate started as a direct reinvention already during the preliminary study running time. After Real Estate Federation took the lead in development, the network involved 34 organisations from the field that joined their forces to concretise the actual technical condition and value of a housing company (D004).

The second formulation of the IKE programme was presented in the final report of *Better Housing 2010*, a national development programme to promote housing as business and multidisciplinary research field and international competitiveness by presenting Finland as an exemplary country of resident-oriented housing (D051, 9, 18—19). In this formulation in 2007, the consortium included in addition to the ministry, Image Builder and Vahanen, also Culminatum, Kiinteistöhallinta SKH and the research project InSert by VTT Technical Research Centre of Finland. *InSert* was one of the openings that were invited to join the IKE programme a year earlier to study alternative replumbing tech-

niques (D037). Better Housing 2010 was followed by *Living Business Cluster* to implement the vision of Finland as an exemplary country of housing (D003). The IKE programme was raised as one of the core themes in the cluster, in which the objective was to develop and pilot service concepts and operations models for housing modernisation and alteration work to improve the building service capability for different and differing ages of people when the real estates are technically ageing, particularly in connection with home services, accessibility, safety and coping at home (D062, 15, 22).

At this point, the preparation of the IKE programme was officially assigned to the ministry and Culminatum that were also responsible of preparing the Living Business Cluster, but Salmi as the leading person in the process continued to co-prepare the programme still for a while before he realised that what the preparatory work was missing was an implementing quarter.

> "When it came to the question of 'who is going to implement this?', the problem arouse that it was about to go for those non-user-oriented experts. You started to get such a feeling that this is not going the way it should. You ought to implement this with those old actors. [...] That is the reason why also my intent started to flag." (CEO Juha Salmi, I05.)

For three years Salmi had been looking for a suitable partner that could conduct innovative research and development in a similar way that had been done in the preliminary study. This time design researchers from Future Home were not able to find a common interest. At Future Home, there were other people on board than when IKE was originally prepared in 2004, who did not seem to be able to take advantage of the preliminary study but rather seemed to focus on general opportunities for developing the service offering at repair construction (D008, D019; I05). Neither was Salmi contented with the traditional research approach to develop technical solutions with quantitative excellence. His personal criterion was that the potential partner should be able to go near people and interpret their experiences as a source of development. In the preliminary study, he had been impressed by residents' stories on their dwelling and renovation experiences and design researchers' capability to create rapport between residents and professionals, to get "under resident's skin" (I01) as he used to repeat to emphasise reaching a deep understanding of residents' experiences. Additionally, the partner should also understand the reality of renovations without needing to start from scratch again. A suitable implementing quarter was never found and eventually the IKE programme faded away along Salmi's renouncement. (I01; I05.)

These challenges did not wear down Salmi's commitment to the project and the ideal vision, but he was determined that he was in a mission to transform repair construction to more interactive and to better serve residents.

> "Although the challenge is kind of impossible,
> whenever talk turns to IKE, I will be in a happy
> mood. It is nice to talk about it to people. It is kind
> of a missionary work. [...] There is something in it.
> It is so out of control that situation. [...] I feel that
> this is one of those things that I will take to an end."
> (CEO Juha Salmi, I01.)

The spirit of IKE was optimistic and solution-oriented to him. The approach offered him content and joy in his work that strengthened his commitment to invest in reinvention. If the IKE programme was not realised, Juha Salmi invested in implementing change at repair construction with other means. He had been preparing with his partner Jouko Taskinen R&D project IKE-VAP to develop a communication model for resident-oriented modernisation to help building managers, housing company board members and other project stakeholders as part of the programme that was later reformulated and retitled IKE-ASKO (D009; D017). In preparing the programme and their own R&D projects, they tried to combine all core aspects, namely communications, resident-orientation, personalisation, processes and decision-making. Resident-orientation was kept in the core of the plans, for example, by focusing on management of the shareholders' process in renovation by enabling alteration work in apartments, management of alternative solutions and compensations, defining the role of the renovation team at the housing company to communicate the shareholders' aspirations, and anticipation of the schedule (D009, 4).

In practice IKE-ASKO was not a proper project but more likely a bundle of development activities including a TV-series on resident-serving replumbing, a DVD on a comprehensive solution for housing renovation and a book about management and communications at a housing company (D020; D025; D047). Salmi finally succeeded in turning his commitment to continuous development into a large communications program *Tee parannus* to develop and promote practices for user-centred, systematic, cost efficient and energy efficient housing renovation and modernisation, three and a half years after the preliminary study was finished (D034; D070; D127). In this program Salmi was able to wrap up resident-oriented modernisation in parallel with the recent requirement on energy efficiency by disseminating the best practices through, for example, launching a website where R&D projects relating to housing, renovation and suburban development are gathered and presented (D070).

In addition to development activities, Salmi appreciated the subject as a journalist: "This is a very interesting topic all in all. It includes all the laws of drama, terrible lack of knowledge, the field is full of mixed messages." (I01.) He had been especially impressed by residents' renovation experiences when having encountered residents in user experience workshops and when explored residents' self-documentions of dwelling and renovation experience with design probes. He applied the complexity of everyday in many occasions in his Finnish iconic television show *Joka kodin asuntomarkkinat* on housing, construction and renovation where he broadened his original focus from presenting accounts by specialists and authority into highlighting also the resident perspective (D033; D046—047; D080).

TV was an integral part of his mission to improve general awareness of the ideal vision resident-oriented modernisation among residents and professionals. Another important measure was to redefine the criteria of national housing and construction industry competitions by highlighting the best practices of resident-orientation.

> "That too has been affected that in the replumbing competition the principle nomination criterion is resident-orientation. Without IKE that would not probably have never been possible. [...] In the criterion it is stated that one must verify how residents have been involved in the project, how they were communicated and how feedback have been collected. [...] If earlier they stressed technology, the resident perspective has become more important." (CEO Juha Salmi, I05.)

The resident-orientation and reciprocal empathic understanding in IKE thus provided insights for Salmi to redefine the evaluation criterion of successful renovation that spread through networking to at least three competitions, in which Salmi was a member in the organising committee or at least had an influence in the content as an opinion leader. Resident-orientation was highlighted in construction industry first when the annual award on distinguished highlighting of a current housing issue was nominated to Risto Vahanen, IKE director, for promoting resident-oriented modernisation in 2005 (D031). Later on the traditional competition for the best housing company act of the year gave an honourable mention to company Vahanen for communication and interaction with residents in its service ReplumbingPlus in 2008 (D043), and a new award on the best replumbing was won by a large construction company NCC in 2008 and by Vahanen in 2010 for a systematic and well-managed replumbing project that served the residents with good communications (D042—043).

Salmi invested even a third of his working hours in reinvention of the innovation resident-oriented modernisation and involved at least 19 of the fifty developments following the innovation, being the most

committed person of the preliminary study participants. He prepared the IKE programme, raised general awareness to the ideal vision, and developed interactive communications for repair construction at least during seven years between preparing the project since 2003 and the second interviews for this dissertation in 2011. Despite difficulties in forming project consortiums, Salmi persevered in advancing the ideal vision resident-oriented modernisation from his vantage point as an opinion leader. He is an example of people representing the most advanced type of innovation-decision process (confirmation for the innovation, and continuous adoption by reinventing it) who was determined that he was in a mission to transform repair construction to more interactive and to better serve residents. He fills all the conditions for commitment (Pfeffer 1981): 1) he had *freely chosen* his commitment when he was one of those who originally suggested the idea of combining people and buildings in exploring residents for the ministry, 2) he had made his commitment *public* as he had produced seminars, TV programs and awards, and 3) he had made his decision *irrevocable* as he had invested even a third of his working hours and creative capacity to the mission that he needed to find a profitable and worthwhile applications to his investment, which again strengthened his commitment (cf. Kanter 1972, 80—82). Moreover, he was vital in connecting different actors in the field, also including the everyday people. He kind of built a community of committed people who *transcended* the necessary evil of housing renovations to a mission of achieving a greater good (cf. Kanter 1972, 111—125). Salmi was empowered by encounters with residents' world, and his commitment to continuous development was revitalised with the convivial criterion of resident-orientation that had brought him fresh air to the stagnant state of affairs in repair construction.

7.3.2 Continuous investment in developing service offering

For the engineering company Vahanen, IKE was an opening to develop *housing renovation service business* that was beyond the company's traditional business logic (Fig. 7.4). There were three people in the company who had been attending in IKE and continued investing in this development stream (I02; I48; I60). Additionally, representatives from a partner company Kiinteistön tuottoanalyysit and a building management alliance Tapiolan Lämpö who had also attended the project became closely involved in the following development work (I21; I54). All these people are repair construction professionals with backgrounds in engineering and building management representing all types of innovation-decision processes in regard to reinvention: one represents type six, confirmation for the innovation and continuous adoption by reinventing it (I02), one represents type five confirmation for a parallel innovation and adoption of the innovation by reinventing it (I60), and

three represents adoption of the innovation by reinventing it (I21; I48; I54). All of they held positions in which they were able to invest more or less to reinvention but only two of them had been involved in developing repair construction with a wider than technical focus before the preliminary study (I02; I60).

The developments at company Vahanen and its partners were built around the IKE-PAP project to develop a service model resident-oriented modernisation, as part of the planned IKE programme (D014; D056, 10). All interviewees from company Vahanen and its partners described the two-year-project as an exceptionally large investment for the firm involving many sorts of activities (I02; I21; I48; I60; I54). The main outcome of the project was the service model ReplumbingPlus that was illustrated with a simplified process model comprising of sequential stages (Fig. 7.5).

The first generation model from 2007 was a simplified presentation of the renovation process phases that highlighted the three main decisions that the housing company has to make, namely, to launch the renovation project, to approve the plan, and to start execution (D039, 1). This model resembles the description of the basic renovation stages and its decision-making points, which I originally visualised as a process that was also used as the structure for the user study in three housing companies, and published in the final report (P92, 13). In the second generation model from 2011, the process is divided to the housing company's and individual shareholders'. The second model resembles the resident-oriented collaborative product and service process that was suggested in the final report (P92, 66): it takes into account that in addition to the housing company board, also individual residents have rights and responsibilities. The tasks in the ReplumbingPlus model allocated to the housing company board relate to the decisions in the whole renovation process whereas for other residents, it depicts the process of alteration work. Both versions of the ReplumbingPlus model aim at pleasant and foreseeable process for residents so that they would have a better possibility to have an influence in decision-making. Moreover, the objective of these processes is to transform renovation from mere repair to an opportunity to improve the living environment. This way renovation was reinterpreted as a tool for holistic and continuous real estate management. (I02; I21; I48; I54; I60.)

> "When the project planning has started, one should dig out the values from the housing company, the people's values. One should also check how they want to live there ten years from now, what kind of housing company they want to live in, and in what kind of environment. And what is, from managerial perspective, the renovation strategy: how to renovate
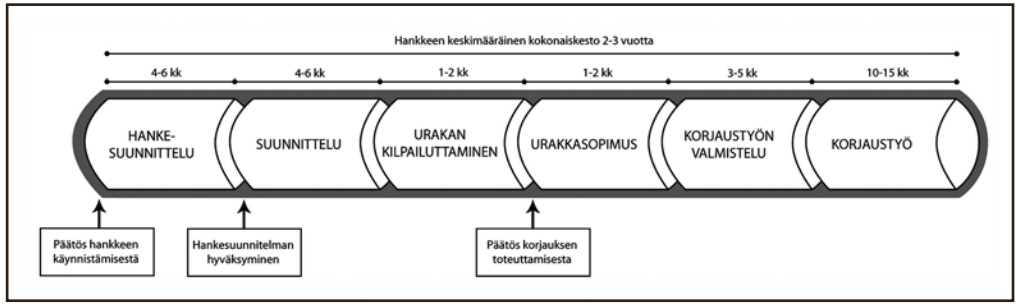
The first generation ReplumbingPlus
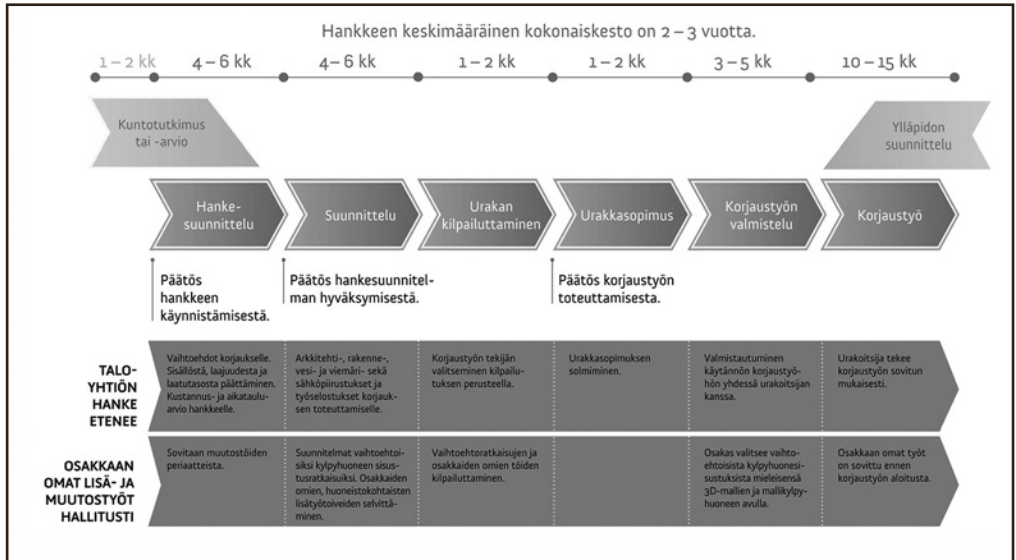
The second generation ReplumbingPlus

FIGURE 7.5
The service model ReplumbingPlus (In Finnish PutkiremonttiPlus)
for resident-oriented modernisation (D039, I; D068, II).

in order to realise the people's vision in a certain time
span. It is values that are there as the driving force."
(Chairman of the board Heimo Levamo, I54.)

The idea to explore feasible development paths for housing companies
welled from learnings in the reciprocal empathic encounters at the
preliminary study. Understanding people's values relates to the idea, as
stated also in the final report, that "at first, one needs to define what
people want in the housing company, and then one will define what will
be done" (P92, 65) because it was seen to streamline the process and
improve customer satisfaction.

      Introducing such a model related in addition to IKE-PAP also to
a larger change occurring at the company based on the preliminary study.

"For the company, it really grabbed our attention on
what there is at the residential building renovations:
to transform the repair processes to development
processes, what kinds of skills are needed in regard to
communication, customer orientation, mass customisa-
tion, and so on. Inside the company, it was an impor-
tant grabber also in realising that we are contributing
to the development in the market instead of just going
with the flow. It is apparent that we have made on
this basis particular recruitment decisions. It had quite
a tangible impact. On the other hand, there appears
to be new business opportunities on what IKE-PAP is
focusing on in order to develop new business logics."
(Chairman of the board Risto Vahanen, I02.)

The company Vahanen had a fifty-year-history on construction engi-
neering that had started to extend its specialist services towards holistic
building and real estate maintenance processes since the 1990s after
Risto Vahanen succeeded his father as the leading figure in the company
(D109, 66). The core business rested upon building physics and reno-
vation planning and the personnel that offered renovation services for
housing companies comprised of engineers and architects (D109). Based
on the insights of IKE, a radical strategic decision was made at Vahanen
to invest on developing a large variety of new services that would rely
on multidisciplinary expertise beyond the traditional engineering and
architecture disciplines. Based on the new strategy and to support
Replumbing Plus, company Vahanen hired communications professionals
to work in housing renovations (D078; D099). The traditional work of
developer consultant was reframed to fit housing company needs and the
ReplumbingPlus service by refocusing from technical issues to process
management and communications services to make sure that resident
communication is of high-quality and comprehensible throughout the

process (D007, D099). The task of the personnel training manager was reframed to include issues that would improve service capability. The condition surveys were marketed from now on for housing companies and also complemented with studies on measurable built environment experience (D098; D104). Additionally, the following R&D projects were conducted with multidisciplinary teams including all the target groups, such as the client and the client's client as the end user, and all other key stakeholders such as in regard to health, safety and other topical aspects. New partners to supplement expertise were constantly looked internationally to cooperate in development work. (I02; I21; I48; I60; I54.)

Along the ideal vision resident-oriented modernisation, people at Vahanen had realised that even without any technical improvement or changes in the process, investment in communication would improve the experienced quality of the renovation projects for which the recently hired communications professional developed a model and marketing material for (D039; D068; D078; D099). In the communications model, the focus was on management of information, customisation of the messages to different groups, and including open information for all parties in a shared language and with visualisations that would help to make the process foreseeable. To open the process further, Tapiolan Lämpö organised in collaboration with Vahanen an orientation course on housing renovation for housing company board members and renovation teams that would start their replumbing within a year or two (D058). By the interviews in 2007, two courses had been organised that concerned the frequently asked questions relating to basic terminology, the process and discussion on the difficulties in replumbing projects that used to waste expensive time of the actual renovation projects. (I02; I21.)

> "This has enabled the rise of the resident activity.
> There are more and more of those people who want
> to influence, at least regarding their own apartments,
> what is it going to be made over there. The communi-
> cations platform had, among other things, has made it
> possible." (Chairman of the board Risto Vahanen, I07.)

Investing in communications with an approximately one percent additional service cost of the replumbing project, introducing a clear process and offering possibility to orientation affected residents' position in the process. It helped residents to start making an influence because they learned to understand and foresee process stages and their share in it, which opened the possibility to ask relevant questions. By taking into account the psychological distress that strains the processes, the service matched to the findings of the preliminary study by avoiding the obscurity of renovation projects and instead focusing on positive cooperation spirit. (I02; I07; I48; I54; I60; P92.)

According to Risto Vahanen (I07), it had become evident by 2011—six years after the preliminary study had ended and four years after IKE-PAP had been started—that investments to developing service business with particular emphasis in resident-orientation and communications were worth the effort. ReplumbingPlus was accepted at the repair construction field as innovation and it won three awards for its contribution to interactive and resident-friendly replumbings (D040; D043; D069). The service model improved the experience of the two main clients of building managers and housing companies, especially by servicing both the housing company board and individual shareholder-residents through interactive communications. Vahanen received feedback for the service from building managers according to which ReplumbingPlus is "the most expensive service on the market today, but it is by far the best for them, because it reduces the risks" (I07). Housing companies used to expect that building managers would manage housing renovation projects but the service model helped to explicate the roles and responsibilities. Building managers are not typically experts of housing renovation or technical aspects in general but their main task has been the financial administration of housing companies (D083). The model released building managers from the unrealistic additional task and transferred the responsibility to the engineering company, which substantially eased building managers' work and also ensured better quality process management by a dedicated process owner. The service model eventually grew to a family of Plus services including in addition to replumbing, also facade repair and building maintenance services (D039). In addition to award nominations and getting feedback from building managers, proof for an interesting solution was received by another company copying the idea in their own service family ProServices (D100). (I02; I05; I21.)

All these changes in a company's activities provided success and growth in business. Within the following years of the preliminary study, the company grew from a medium family enterprise to a large consolidated corporation. Even though there were many other reasons for the growth, also the preliminary study had its share, especially in improving self-regard and giving a new identity based on the realisation that "we are contributing to the development in the market instead of just going with the flow" (I02). During the years Vahanen and his company became opinion leaders in repair construction after becoming a popular advocate for resident-oriented modernisation and introducing ReplumbingPlus as an innovative solution for the problem.

The success naturally required lots of effort and devotion, and also finding a collective mission. The collective mission was found through all the innovation-decision levels—optional, collective and authority-driven—that according to Rogers (2003, 403) may occur in organisations. That is, Risto Vahanen's made his personal decision to initiate the preliminary study, for which he gained confirmation in IKE

and decided to invest for reinvention (optional innovation-decision). In the beginning of the preliminary study, however, it was not evident to all employees to embrace the holistic and resident-oriented approach, even though Risto Vahanen's personal commitment towards holistic real estate management well from insights in his career since the 1970s. For some employees, IKE as a preliminary study was a platform to work out the idea and build a personal relationship with. It was an opening also to those people who used to think that "yeah yeah clients are the root of all evil, and hinder work and take time" (I60) by showing that renovation was not business as usual but needed serious consideration of partnerships with residents due to the housing company system. Reciprocal empathic encounters in the preliminary study had helped them to understand the resident perspective, which had made them committed to finding solution for better services that would create new business opportunities and would also make their work life more pleasant (I02; I54; I60). Based on the experiences in IKE and the ideal vision resident-oriented modernisation for repair, the third decision was made as the company outlined its new strategy to focus on services for people and improving the experience of the built environment (authority-driven decision).

This kind of multi-level decision to adopt and implement the innovation led to commitment to continuous development. It meant that there was no infinite solution but the company needed to regenerate constantly.

> "Worst-case scenario, of course, is if people with the technical training would start latching again on to technology. That's why we would need more and more those people who would understand holistic approach, and would take process and customer leadership responsibility. It leads without question to the fact that we would need more multi-disciplinary people in the firm. [...] it was evident that it evokes pain among technical people if they need to convert to customer-orientation." (Chairman of the board Risto Vahanen, I07.)

The risk that the organisation would become contended with itself and regress to old behaviour was fought with continuous investments to development. The project KEKO was initiated as an IKE-PAP spin-off to develop an expert-driven service model to reach environmental and lifecycle objectives at construction, renovation and real estate management (D060). To increase the social know-how and holistic approach in the company, Vahanen joined the design university in preparing a new university-led collaborative R&D project Suburb 2072, which aimed at seizing the housing renovation momentum and including inhabitants' active role to meet ethical and sustainable development of the neighbourhood with eight organisations (Heikkinen et al. 2012; D101, 26—27).

Suburb 2072 was an initiative by the design university based on the preliminary study and my ongoing analysis for this dissertation showing that even there were lots of developments going on based on the innovation, many of them seemed be separate, not joining their forces due to breakdown of the IKE programme. Vahanen agreed that collective endeavours with a creative twist were needed for dealing the growing amount of renovations in suburbs and launched their new development project Lähiöharmonia under the larger R&D consortium to broaden their renovation and modernisation services to areal renewal in suburbs (D101, 28—29). The project applied collaborative design approach, which allowed Vahanen personnel to act locally in the capital region suburb and to experiment their latest service model with local people. This time the focus was not anymore on learning that there are residents that are individuals, as in the IKE preliminary study, or developing basic service models for replumbing, as in IKE-PAP, but how to grow as specialists in order to be able to service communities and possibly even lead neighbourhood development along housing renovations (D101, 28).

7.3.3   Resident-oriented housing modernisation in building policy

The development stream *guidance for repair construction* led by the Ministry of the Environment relates to matters that are prepared in the Department of the Built Environment to guide and develop policies relating, among other issues, to repair construction in Finland (D107). Four of the steering group members from the ministry continued with reinvention of the ideal vision resident-oriented modernisation (I04; I50; I61; I63). Their core work is to develop guidance and therefore they also were all representatives of the most advanced innovation-decision process (type six), confirmation for the innovation and continuous adoption by reinventing it, who were continuously investing in development of repair construction or housing with a variety of perspectives that were deemed important in the Finnish society.

     The ministry has three main guidance instruments to govern activities in Finland in regard to the built environment from the legally binding to more open systems: *legislation guidance* that regulates "finances and operations with legally binding norms", *financial guidance* that influence "operations and behaviour by granting funding", and *information guidance* that concerns "advice, recommendations, gathering and spreading good practices and other influence through the production and distribution of information and the dissemination of knowledge" (D071, 1—2; I04). IKE provided support primarily for information guidance that is the most open and early means. The final report of the IKE preliminary study was published in the Finnish Environment publication series that the ministry's has used for publishing studies it has commis-

sioned relating, for example, to renovations, dwelling and apartment buildings since the mid-1990s (D136; P92). The studies published in the series are part of the ministry's tools for guidance that aims at affecting behaviour among people. Therefore the IKE report was also considered the ministry's opinion on housing renovations and as such was a governmental guideline for repair construction.

The IKE preliminary study report was especially popular: the printed edition finished soon but the report continued to be available in the Internet (P92), and has been referred to in many reports and published as framing for R&D in programmes, and included in a database (e.g. D027; 6, 8, 11—12, 67; D051, 9; 18—19; D061, D062, 45; D070, D085). This was also the experience of the state officials who told that "IKE has been well featured" (I04) and frequent feedback signalled that the message spread well (I01; I04; I56). Popularity of the report was probably related to both the topicality of the subject—as all professionals in the field needed to shape some sort of an opinion about the future of repair construction—and activities to launch the IKE programme.

While the report affected for its part the public opinion of the needed development direction for repair construction, the state officials took also another measure to promote the ideal vision resident-oriented modernisation when they applied the innovation in preparing the national strategy for repair construction (I04; I50; I61; I63). The working group of the strategy was established at the same time as IKE was running in order to define what kind of a building and housing policy Finland would lead and to outline the maintenance and renovation of the existing built environment between 2007 and 2017 (D006, D044). Building counsellor Erkki Laitinen, vice chair of the IKE steering group, was appointed to chair of the strategy working group, while architect Harri Hakaste appointed to secretary and housing counsellor Raija Hynynen member in the strategy working group had been members in the IKE steering group (D065; P09). The parallelism was sort of a coincidence because IKE was not originally commissioned to provide information for the strategy work, but it was an opportune preliminary study, initiated originally by field practitioners that immediately served also development of guidance. In this work, the vision written in the report was not the only tool for the state officials working in the ministry to formulate their opinion on the renovation matter, but the project itself—with its open-ended phrasing of question and interactive working method—allowed them to develop a well-thought and inspiring starting point for the following work. (I04; I08; I61; I63.)

The resulting strategy focused on the entire built environment, including residential buildings, holiday homes, service buildings, warehouses, industrial and transport buildings, outbuildings and other buildings but not the infrastructure. As half of repair construction concerns residential buildings, it was also central in the measures suggested

by the strategy. (D006, 3, 9.) The strategy emphasised the connection of people and buildings by stating that the built property should be developed in a way that it would meet the needs of people and sustainable development (D006, 17).

> "The main objective for the strategy working group was to promote proactive building management and renovation culture, and adaptation of the housing stock to changing needs. [...] The all-embracing themes that are emphasised in the strategy are resident and user-oriented, sustainable-friendly repair, and consideration of the characteristics of the building at planning and construction." (D006, 3.)

To meet this objective, development of repair construction until 2017 suggested to have four main streams concerning 1) establishment and institutionalisation of maintenance and renovation culture of the buildings, 2) development of renovation guidance and processes, 3) increasing renovation know-how and securing resources, and 4) satisfying the information need on renovation (D006, 18).

The working group gave the strategy for repair construction to the Housing Minister Jan Vapaavuori on 3rd July 2007, two years after publishing the IKE report (D006; P92), which was approved by the Government resolution for repair construction on 18th August 2009 (D001). The resolution reformulated objectives as 1) to maintain and improve the service capacity and quality level of the housing stock, 2) to reduce the energy consumption and emissions of the housing stock, 3) to develop the building renovation governance, and 4) to strengthen knowledge, expertise, competitiveness of renovation (D001, 1). Energy efficiency became one of the main themes in the development of built environment and because the rate of new building construction is only one percent, the focus should be on improving the quality of the existing built environment (D006, 9).

Based on the resolution, the governmental work continued with the implementation plan for the strategy for repair construction between 2009 and 2017, consisting of thirteen measures for action including tools for building management and financial guidance, role of authorities such as municipalities, issues relating to energy efficiency, damp and mould damages, and ageing and accessibility, and improvement at authority guidance, material efficiency, follow-up, distribution of information, know-how, processes and services (D044). The measures to meet the plan included the study *KORVO* that the ministry commissioned to develop guidance system for renovation and retrofitting of elevators in buildings that highlighted, for example, the importance of careful planning in order to create a long-term vision for the basis of renovation decisions, a project to compose a unified guideline for

housing companies to define their development strategy as part of "developing building management tools towards user-friendly ensemble and advancing resident- and user-driven strategic building development" (D074, 2), and a study on the future of building management (D050; D074, 2, D079; D083). The ministry also published the Internet site *korjaustieto.fi* to offer useful information on maintenance and renovation of homes and housing companies (D023). In 2011, there was going on development of the *housing company strategy* that was aimed at helping housing companies to plan their long-term maintenance through which crystallising the residents' and shareholders' objectives for developing the real estate (D079).

With these variety of measures, the ideal vision resident-oriented modernisation was incorporated in the building policy in regard to the existing built environment. Many of the activities would have happened without IKE but by opening a novel perspective, IKE as a process of exploring and visioning as well as proposing an ideal vision for repair construction supported the work of the state officials and also had raised hope among state officials for a new culture of repair construction (I08). One of the core aspects in this novel perspective had been, according to an interviewee, that the resident perspective had been constantly and systematically linked to technical and economical issues. It opened a new vista to the Finnish repair construction field, in which social and technical are part of the same whole.

> "Understanding what a multidisciplinary matter it is. I believe that IKE contributed by shedding light on it in a very good way, because if we would forget the technical side, and only considered the people, the residents, it would again be only half of it. How can these be connected? The question is about the whole entity." (Building counsellor Erkki Laitinen, I08.)

This holistic combination of social and technical perspectives helped in refocusing from building construction to maintenance culture and from production to service orientation. Naturally representatives of the ministry had considered citizens and maintenance of the existing building stock in their work also earlier on, but by highlighting the residents' real world within housing renovation, IKE provided "new perspective and boost" (I04).

> "It is a difficult process, to carry through a replumbing or retrofitting an elevator. It is incomprehensible that the payer is not listened to and someone else takes over the process, the contractors and the developer. [...] If one has the technical know-how, it does not give the right to walk over

the payers. [...] I had a preconception, and now I am able to accurately say that this is how it is." (Housing counsellor Raija Hynynen, I63.)

"The resident point of view was strongly highlighted there. I'm wondering about the hierarchy of needs, that there is a particular emphasis: some things must be taken into account and concern all. But then, people are different, there are some things that some people would like to have, but not all. They have individual needs." (Architect Harri Hakaste, I61.)

These above statements illustrate how the state officials were able to interpret residents' renovation experiences from their own perspective and to emphasise it differently also at the strategy working group and measures beyond. From housing counsellor Hynynen's perspective IKE was a start to resident-oriented developments in repair construction that was lacking social and service skills that would help to take residents into account (I63). Architect Hakaste then used to be a practitioner in architecture and emphasised practical perspectives in the developing processes for repair construction (I61). He understood the dissimilarity of residents and, thereby, separated need of activities but also that residents need pertinent communications to ensure that everybody knows the progress and allows people to prepare themselves for the following stages. For building counsellor Laitinen, resident-orientated modernisa-tion belonged to a bigger picture where IKE had been a breakthrough in drawing a parallel between people and buildings also in the sense of combining perspectives in an equilibrium instead of overtly emphasising one over another (I04; I08).

With such a well of insights, IKE, the preliminary study and its planned national R&D programme, had become a symbol of resi-dent-orientation and long-term thinking in built environment. It was highlighted in the strategy as "The most significant individual develop-ment projects that can be mentioned here is the project Living Cycles of People and Buildings (IKE)" (D006, 16). This statement, along with interviewees' personal statements above, illustrates the impact of IKE in regard to considering residents as part of repair construction. What is interesting, is that these state officials never met with the residents in workshops or other occasions. This is interesting particularly because it is contradicting with earlier research and beliefs in collaborative design, according to which commitment is built through involvement and participation (Halse et al. 2010; Sanders & Stappers 2012; Soini 2006). In design literature it has also been discussed that a design process should comprise different ways to tempt participation of different kinds of stakeholders (e.g. Buur et al. 2013).

The case is however not that simple. In IKE, residents' dwelling and renovation experiences were conveyed by the project team with whom the ministry representatives had regular steering group meetings. There were no design sessions organised but the materials were circulated in a traditional meeting table setting and discussed with the formalised meeting procedures led by a chairman. In these meetings, findings were shared and issues of the everyday were reflected in relation to broader societal issues. Additionally, some of the ministry representatives attended the synthesis workshop, but it did not seem to differentiate the level of commitment. The leader of the following development, building counsellor Erkki Laitinen, had not the opportunity to attend the workshops but he was still very much committed to the ideal vision in his work in the following years. The main opportunity to explore the user study materials thus took place afresh in steering group meetings through collective interpretation, reflection and exploration, without elaborate reports by the design researchers. This supports earlier findings that open-ended and incomplete representation styles inspire creativity and serve future appropriation because people have the opportunity to create their own interpretation in relation to their own expertise (e.g. Mattelmäki et al. 2011).

More importantly, the indirect dialogue between ministry representatives and residents opens an intriguing implication for collaborative design dealing with systemic change: in a project like IKE, there are different kinds of actors whose social groupings and roles within affect their contribution as well in the project as the following developments. There is no need to equally involve all participants in similar activities, because they have different expertise, work styles and resources. The other way round, people devise "courses of action aimed at changing existing situations into preferred ones" (Simon 1996, 111) in different ways, from their standpoint. Part of the success of IKE was probably based on facilitators' capability to sensitively and mostly intuitively identify different vertical roles in the complex system of repair construction, and to ensure with multi-level interaction that the parties had enough opportunities to form their personal interpretation of the emerging ideal vision.

8. Discussion

While research on collaborative design has referred to connections between design making and appropriation of outcomes, it has neglected closer examination of the long-term contribution of collaborative design in actualising change in regard to complex systems (cf. Björgvinsson et al. 2012; Buur & Matthews 2008; Clement & Van den Basselaar 1993; Hasu et al. 2014; Hobday et al. 2011; Hobday et al. 2012; Verganti 2009). The present dissertation contributes to understanding the value of this activity by providing empirical evidence of the contribution of collaborative design in the systemic change of Finnish repair construction. The findings in this research stem from a longitudinal case study that tells a real life story of collaborative design being involved in a systemic change of Finnish repair construction through an extensive multi-method analysis of 98 project documents, 63 follow-up interviews, and 136 documents from a timespan of seven years. The studied case is the systemic change of repair construction towards resident-oriented modernisation between 2004 and 2011, and examination of the facilitative role of collaborative design in it, as was conducted during the IKE project in 2004 and 2005.

In the following, I conclude the research by presenting the main findings in regard to facilitating systemic change with collaborative design, and discuss the implications of these. I also reflect the research process now that it is finished, and end this dissertation with insights to future prospects.

8.1   FACILITATING SYSTEMIC CHANGE
WITH COLLABORATIVE DESIGN

In this dissertation, I have argued that the contribution and position of collaborative design in the transformation of Finnish repair construction, resides in facilitation. It means that the *contribution* of design was to enable consistent transformation in the field from technical orientation towards resident-oriented modernisation by providing means to explore an ideal vision of repair construction as a shared starting point for change. Majority of the 59 interviewed project participants became strongly committed to this vision resident-oriented modernisation, and implemented change through fifty developments in vertical levels of the complex system. Facilitation further locates the *position* of collaborative design in repair construction: design did not initiate or implement the change but rather responded to the professional practitioners' need for finding a starting point for change and prompted reinitation in the field. This finding supports design research that considers facilitation one of the main means of collaborative design in enabling multiple stakeholders to encounter each other, to generate proposals for new futures together, and to reify outcomes for later appropriation (e.g. Binder et al. 2008; Halse et al. 2010; Mattelmäki & Sleeswijk Visser 2011; Sanders & Stappers 2012; Thackara 2005; Vaajakallio 2012). By examining facilitation within a longer timeframe and larger context, this research exemplifies facilitation as a relational activity that may extend its impacts to systemic change—a paradigmatic transformation vertically in "all levels of the system" (Reigeluth 1994, 3).

The systemic change of repair construction between 2004 and 2011—that was "broad in scope and large in scale" (Carr-Chellman 1998, 372)—is summarised in table 8.1. In 2004, repair construction borrowed its criteria from new building construction and emphasised technical, schedule, and cost management in its processes and activities. There was quite a stagnant situation in regard to development. The first developments for repair construction had taken place during the Great Depression of 1990, during which the state of Finland and municipalities had boosted construction industry by investing in repair construction. R&D on repair construction quickly subsided when the economic situation started to improve and new building construction started to grow again. In the beginning of the new millennium, there were only few pioneers who experimented with more holistic socio-technical solutions, and the few socio-technical solutions were dispersed in the real estate

	SITUATION IN 2004	SITUATION IN 2011
VISION	No mutual understanding or vision for handling the upcoming wave of housing renovations.	Resident-oriented housing modernisation is the shared ideal vision for repair construction that was adopted as an idea innovation among 69 percent of the IKE project participants, and beyond.
SCOPE	Few socio-technical solutions are dispersed in the real estate and construction industry.	Fifty developments at private and public sectors following the innovation between 2005 and 2011, including also other fields of application.
SCALE	Few pioneers experiment with alternative socio-technical solutions.	Change involves vertically governmental, organisational and individual endeavours as well as public demand for change.
STATUS	Stagnant situation in regard to development. Repair construction borrows its criteria from new building construction emphasising technical, schedule, and cost management.	In progress. Three stages of development have applied the same vision. The vision is becoming established as the added criteria of repair construction. Repair construction would next need further ideas for supporting operational systems, sociocultural adaptation to the change, and diffusion of the ideal vision in the whole system.

TABLE 8.1:
The systemic change of repair construction towards resident-oriented housing modernisation between 2004 and 2011.

and construction industry without a mutual understanding or vision of how to handle the upcoming wave of housing renovations.

In 2011, situation looked quite different. Resident-oriented modernisation had become the shared ideal vision for repair construction among the project members, which was adopted by 69 percent of project participants and implemented through a large variety of developments at private and public sectors following the vision. Through these 50 developments following the innovation, the impact grew beyond the project participants. Resident-orientation had become the new norm of housing renovations: if involving residents in renovation processes had seemed peculiar in 2004, solutions were justified by the resident perspective seven years later. The competition in the markets was guided by the capability of acknowledging residents as customers. Also media and innovation competitions embraced the convivial criteria that put the residents in the centre, and probably nobody dared to question the new criteria anymore. Even though there were already three stages of development applying the same vision concerning the individual, organisational and governmental levels, the systemic change was still in progress. Repair construction would next need further ideas for supporting operational systems, sociocultural adaptation to the change, and diffusion of the ideal vision in the whole system.

The process of systemic change of repair construction towards resident-oriented modernisation is visualised in figure 8.1. The figure illustrates the continuous process of development (dash line) that is going on in repair construction, which fluctuates with its intensity and

breadth of endeavours, and with which some actors are committed to in their professional activity in the long run. This matter of *professionals committed to continuously develop repair construction* (henceforth, references to figure 8.1 are marked with italics) takes place disregard the contribution of collaborative design, even though IKE and collaborative design within had provided "new perspective and boost" (104).

The change process within the continuous development in the field is depicted in the figure with three parallel arrowy boxes. These are the main stages in the process of systemic change in Finnish repair construction in regard to IKE: 1) joining in the exploration, 2) generating the ideal vision for repair construction in the project, and 3) implementing change in the field. The process is an adaptation from the

FIGURE 8.1
The process of systemic change of repair construction towards resident-oriented housing modernisation. Collaborative design, portrayed in the circle, facilitates change from within the IKE project. Adapted from Rogers (2003, 170).
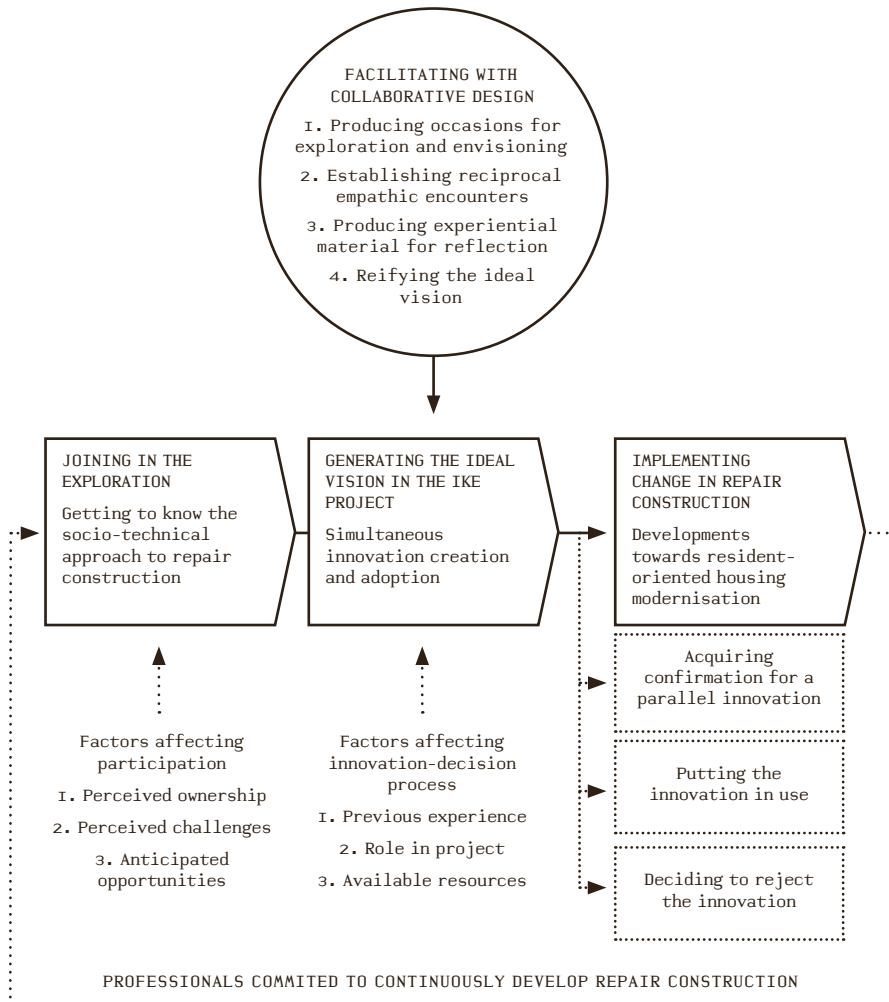
innovation-decision process presented by Rogers (2003, 170): it interprets the five stages model (knowledge, persuasion, decision, implementation, and confirmation, and factors affecting these), into three stages based on the findings in this research. With qualitative research material the boundaries between all five stages did not become visible, but a similar process of going through certain stages can be temporally located in regard to the project (before, during, and after).

Joining in the exploration is the first identified stage of systemic change, during which the project participants *got to know the socio-technical approach to repair construction*. There were four types of entries. The first group joined the exploration by initiating the preliminary study (three professionals). The second group joined in by becoming part of the project team by being a steering and a project group member (three professionals and three design researchers in addition to the initiators). The third group joined in as informants in the use study in three housing companies (twenty residents and three professionals). The fourth group joined in the user experience and the synthesis workshops as invited participants (23 professionals and four design researchers). The first group represents the most involved project participants, whereas the fourth group represents the least involved project participants what comes to temporal and other resources investment in the project process.

Among the participants, there were certain *factors affecting participation* that were relative to this intensity of involvement. The participants who had prior involvement with the sociocultural approach in repair construction or other connection, *perceived ownership* on the cause that they strengthened during the project. On the contrary, without having a strong personal ownership to the complex issue, participants felt like being a visitor on someone else's turf and more likely avoided involvement more than was necessary. The majority of the project participants *perceived challenges* at repair construction already before the project, which motivated them to explore the phenomenon. The understanding of the challenges deepened and enriched along the project to consider, for example, residents life situation that seemed to affect general attitude toward renovation. Those who perceived challenges, they often also *anticipated opportunities* in innovating repair construction of apartment buildings. They were motivated to invest time to understand the phenomenon better, and the more they invested the better they grasped the everyday aspect of residents dwelling and renovation experiences.

67 people from 30 organisations representing housing companies, construction, renovation and engineering business, communications, governmental and city organisations, NGOs, real estate management, manufacturing, and research and educational institutes involved in *generating the ideal vision in the IKE project*. The ideal vision—"the ultimate goal of an ideal vision of the *whole*" (Carr-Chellman 1998, 373)—that was created in IKE is called resident-oriented modernisation.

The ideal vision (idea innovation) is that all residents are considered central in housing renovation, and the renovation processes are seen as an opportunity to improve the living standard and technical quality of the built environment. For residents, the perceived function and meaning of the innovation was that it offered a sense of ownership in the renovation process and sense of community in the housing company in general. For repair construction professionals, the ideal vision introduced a new identity as caring about the greater good through being a service provider of a collective process. For design researchers, the meaningfulness was in leveraging their work as interpreters who study and envision new meanings. The reinitiation of the field is built on residents' renovation experiences. What was critical in adopting the idea, was that people and buildings, often thought as opposite aspects, were not repealed but they were viewed side by side, in conjunction. The focus was solely neither on techno-economical nor on social issues but the technical act of renovation was explored from the human point of view.

This exploration was facilitated by collaborative design approach, which enabled that IKE involved *simultaneous innovation creation and adoption*. During the project, collective creation of the ideal vision resident-oriented modernisation was organised so that participants were able to personally interpret the meaning of the ideal vision along, which helped them in their personal innovation-decision. This kind of personal and collective sense-making (cf. Krippendorff 1989; 2006; Verganti 2009) was supported with facilitation. According to my findings, the main activities of *facilitating with collaborative design* are:

- Producing various occasions for different stakeholders to participate in exploration and envisioning.

- Establishing reciprocal empathic encounters between residents and repair construction professionals.

- Producing experiential material for reflection between everyday and society for various project occasions.

- Reifying the ideal vision with visualisations and storytelling for later use.

Producing occasions for exploration and envisioning included the user experience and synthesis workshops as specific target-driven events for exploration and envisioning, and also other more open-ended and sometimes impulsive opportunities that were often related to project and steering group meetings. The residents' experiences provided a ground for *establishing reciprocal empathic encounters* between residents and repair construction professionals at the three user experience workshops where participants started to build understanding on each others' perspectives. These workshops were based on the extensive user study

about residents' dwelling and renovation experiences in three housing companies. Extensive user study involved investigation of the studied housing companies' histories, culture and future plans, collective interpretations of the planned, ongoing or finished replumbing projects, and individual explorations of memories, experiences and expectations in regard to dwelling in midst of renovation. The user study was the core of the project and continued to characterise exploration and envisioning: the resident perspective was generally used for challenging the prevailing perceptions and in making sense of successful renovation (the ideal vision).

Producing experiential material for reflection brought insights for the collective process. In IKE, it meant that collaborative design brought to exploration tangible material such as photos and small stories that the residents had documented in their renovation moments, home albums in which residents had told their dwelling histories since they were born, and recipes of good dwelling in which residents had outlined their dreams of the home, its environment and beyond. This rich and open-ended material accompanied with interpretations and summaries were used in the project work to reflect residents' everyday with and long-term and wide-ranging considerations in the affluent society. The residents' stories provided a tangible and easy-to-understand perspective that helped to share ideas between different disciplinary issues of engineering, process management, communications, public discussion, design and accessibility, and to holistically make sense of repair construction as a process and phenomenon. *Reifying the ideal vision* was also built upon residents' perspective. This task gets the closest to the traditional design tasks, including storytelling and visualisations to reify project findings in a form that can be appropriated later on. The visual representation separated IKE from other preliminary studies commissioned by the ministry, made it more inspiring, and offered an interface between the 67 project participants and others who should be interested in the issue.

The ideal vision resident-oriented modernisation was adopted by 69 percent of the project participants who put the innovation in use or implemented change through reinvention between 2005 and 2011. The rest rejected the ideal vision as such even though some of them acquired confirmation for a parallel innovation that reassured their line of action. The analysis illustrates that the *factors affecting innovation-decision process* stemmed from longer time than IKE during 2004 and 2005. The first of these, *previous experience*, related to the situation in which the participants joined in the exploration. 55 percent of all adopters, and 80 percent of those who invested in reinvention, had prior related knowledge on the combination of social and technological aspects before the project. The second factor, *role in project*, was based on the division of roles between project and/or steering group members, invited participants for single events, and informants in the user study.

Rejecters and adopters by use were almost all informants and invited participants for single events. They did not perceive ownership on the cause but thought that developing repair construction was someone else's mission. On the contrary, those who were most committed to reinvention comprised of project and steering group members who had been able to start linking their personal and organisational agendas and values already when IKE was prepared, when the main decisions in regard to foundations of the ideal vision were actually made, such as combining social and technical aspects. The third factor, *available resources*, delineates practically whether the adopter had authority to allocate their own and personnel working hours, their work included development activities and responsibilities, and a position in professional community to influence general opinion. Those who had available resources to implement change, were more likely to invest in reinvention. Often they were middle managers and executives whose work included also development responsibilities. Those—often residents—who did not have these resources and even though they would have found personal meaningfulness and commitment to the ideal vision, they did not implement change through reinvention.

Based on analysis adapted from Rogers (2003) innovation decision-process, there were six distinctive types of outcomes of innovation-decision processes among the interviewed project IKE participants: 1) rejection of the innovation, 2) rejection of the innovation but confirmation for a parallel innovation, 3) adoption of the innovation by use, 4) adoption of the innovation by reinventing it, 5) confirmation for a parallel innovation, and 6) adoption of the innovation by reinventing it and confirmation for the innovation and continuous adoption by reinventing it. Participants representing types one to three ended up in *deciding to reject to innovation* (31 percent of interviewees) and *putting the innovation in use* (27 percent of interviewees), and did not find opportunities or motivation for implementing change in the repair construction system. However, use and also *acquiring confirmation for a parallel innovation* (23 percent of rejecters) can be seen as an indirect impact to promote change as the socio-technical vision spreads in everyday activities and solutions beyond repair construction. The types four to six (42 percent of interviewees) contributed in *implementing change in repair construction*. These 25 repair construction professionals and design researchers from 14 organisations are responsible of fifty *developments towards resident-oriented housing modernisation*, which comprise public and private development projects and solutions. These participants had built commitment to the innovation, that is, they chose to follow the idea consistently in their decisions and actions in the future that was further strengthened the more they invested in reinvention. They often also perceived particular meaningfulness,

such as a personal mission or more satisfaction at work, which further confirmed their commitment.

In sum, the empirical evidence shows that exploration and envisioning in IKE and committed reinvention based on the ideal vision transformed Finnish repair construction from a technically-oriented professional activity toward resident-oriented interactive practice. The ideal vision helped in implementing systemic change, that is, it changed repair construction vertically in individual, organisational and governmental levels, and simultaneously in many dimensions, including solutions, practices, policies and culture. Based on the ideal vision resident-oriented modernisation, there occurred change in behaviour of individuals and organisations toward more interactive practices, resident-orientation became a new criteria for repair construction, business logics were redefined on the basis of service business, and the ideal vision was included in government guidance. What was the contribution of collaborative design here, is facilitation of change through producing occasions for exploration and envisioning, and producing experiential material for the change process during IKE and for later use. The preposition in the title of this chapter, facilitating systemic change *with* collaborative design, highlights the position of collaborative design as a facilitation approach that works for the complex system, and at those people's command who initiate and implement systemic change.

8.1.1   Implications

Benefits of the systemic change covered, firstly, the IKE participants who got empowered, found new meaningfulness and a reinitiation in regard to repair construction. They found a more equal partnership between residents and professionals, knew how to better interact in a housing company, became more appreciated by the client and therefore more pleased in their work, got means to invest in professional development and to introduce new solutions, grew business and performed their societal task to introduce solutions for tackling the growing amount of housing renovations. Benefits, secondly, include also other citizens, organisations and parties that have not been included to this study but who apparently enjoyed the fruits of labour by watching TV, attending seminars, reading books, browsing webpages, ordering a replumbing or other renovation project from the IKE participants, interacting with people and organisations who had been involved in IKE, conducting their own research and development with the help of the project outcomes and following developments, and so on. As IKE was a public project that made a broad impact because it was commissioned and endorsed by the Ministry of the Environment and involved opinion leaders whose efforts and contributions were followed, it is practically impossible to draw a definitive boundary to the impacts and consequences.

The systemic change is no means ready (it will never be), and luckily it seems that the systemic change keeps on going, and similar collaborative endeavours are further needed for Finnish repair construction. This dissertation provides issues for consideration and has two main practical implications: the dissertation highlights, firstly, the systemic nature of transformation towards resident-oriented modernisation, which should help to consider temporal and dimensional aspects within, and secondly, the contribution and position for collaborative design, which should help to find practical ways for future collaboration. The presented approach of collaborative design for systemic change can be seen an alternative approach to local innovation platforms that are suggested to build networks of private, public and research organisations to induce locally valuable regeneration (Kostiainen 2007). While these local innovation platforms are rooted to the special characteristics of the geographical location and aim at dynamic self-change, this research highlights other kinds of agglomerations built around a particular subject field that can be (or become) an identifiable complex system even though geographically dispersed. The similarity is that innovation is built upon people, sense-making and contextual sensitivity (cf. Kostiainen 2007, 13—14).

When viewing collaborative design as a form of facilitation approach for systemic change, this research provides further support to collaborative design facilitation as an activity that deals with complex systems that are inherently wicked and require new forms of problem solving. Based on this research, there are three implications for design research on creating proposals for alternative futures that are meaningful interpretations of complex systems because they have been simultaneously explored and rehearsed (cf. Björgvinsson et al. 2012, Burns et al. 2002; Gamman & Thorpe 2011; Halse et al. 2010; Koskinen et al. 2003; Mattelmäki 2006; Redström 2006; Sanders & Stappers 2012; Thackara 2005; Vaajakallio 2012; Westerlund et al. 2003).

Firstly, facilitation should be seen more widely than only workshops or other specific design events. Collaborative design should produce *various occasions for exploration and envisioning during the project process*, such as workshops specific events for exploration and envisioning but also other more informal opportunities to dive into the sociocultural considerations. In IKE, the gatherings were occasions for collective sense-making of an alternative future for repair construction. While sense-making is seen as one of the main means to enable change by design (Buchanan 2001; Krippendorff 1989; 2006; Mattelmäki et al 2014), the findings of this research offer support that sense-making also applies for collective activities among various stakeholders in the context of systemic change. In IKE, making sense rather holistically involved building understanding of the prevailing practice, exploring residents' experiences and envisioning an alternative future for repair construction.

As the concept of sense-making calls for holistic approach (Verganti 2009, 185), the focus expanded from renovation to dwelling (life instead of use), experiential and multifaceted stories of residents (persons instead of users), and building understanding on motivations, interests and meanings (reasons) in such a way that it prepared the ground for implementing change after the project. This kind of exploration requires explorative mindset and different kinds of collaborative forums so that people from different social groupings and positions within would find motivation for participating in the process. Practically, it means that in facilitation factors affecting participation should be considered in regard to the whole collective process and each individual activity to ensure that reinvention would become possible for as many as possible.

Secondly, facilitation relates to considering *reciprocal empathy between different stakeholders*. The reciprocal aspect of empathy presented in this dissertation elaborates research on empathic design (Koskinen et al. 2003; Mattelmäki et al. 2014): when broadening empathic approach to collaborative design, facilitators need to consider multiple aspects and perspectives. The sole focus on building empathy is not anymore at users but also in creating circumstances where participants can build trust and mutual understanding in order to give rise to successful adoption and reinvention. Acknowledging participants' earlier commitments and the broader context of the project is vital for facilitation in order to fully tap the potential of design in making a change. Enabling the appropriation of project outcomes in reinvention of the innovation, in the most advanced forms, can also support commitment to continuous development.

Thirdly, the ultimate objective of *facilitation should be seen as inducing change*. Workshops are collective activities that are often described, for example, as events for organising dialogue, supporting empathic understanding and gaining several contributions in design through collective creativity (Johansson et al. 2002; Sanders & Stappers 2012; Vaajakallio 2012), but facilitation in IKE events refers primarily to output in inducing change among participants. In workshops, the reciprocal encounters challenged participants' personal viewpoints and preoccupations with an alternative perspective. For residents that meant that those who adopted the innovation started to see themselves responsible and capable of affecting their living environment. However the research also shows that residents were restricted to have an impact only on issues that already had structural premises to involve: residents did not invest in reinvention. This supports earlier findings that they should be empowered with more practical means if change is wished to actualise among these central but resource-weak stakeholders (cf. Björgvinsson et al. 2012). Instead, for professionals the exploration meant that they started to see their activity in a broader than typical professional context populated with facts. Among those who invested in reinvention, the reciprocal

empathic encounter changed their point of reference in determining what is valuable and worth pursuing.

In general, my findings support the vision many design thinkers and also policy-makers have presented (e.g. European Commission 23.9.2013; Gamman & Thorpe 2011; Mau et al. 2004; Thackara 2005) that collaborative design is a vital innovation activity to generate inclusive change in society. Collaborative design of complex systems that aim at inducing systemic change is definitely one of the feasible ways of application that fill the promise of design as an instrumental activity for change (e.g. Forty 1992; Friedman 2003; Heskett 1980; Simon 1996). Here, the details of residents' renovation experiences did not prevent members from imagining beyond the existing realm, a limitation user-centred design has been accused of (Norman & Verganti 2014; Verganti 2008; Verganti 2009), but everyday details provided by residents actually provoked critical debates and encouraged to radically reinitiate repair construction. Many of the people participating the debates, for example in the project and steering group meetings, were top-ranking experts in their field who had special access to the overarching themes concerning repair construction, and who were also practiced in distancing themselves from the details and to see the bigger picture. The collective sense-making (Krippendorff 2006; Verganti 2009) based on a particular point of view of residents was important in eventually ending up with a consensus in regard to offering a proposal for an alternative future as the innovation resident-oriented modernisation reinitiated the professional field of repair construction.

In regard to diffusion of innovations, this research presents that reinvention is a means to implement systemic change, instead of a sign of a weak innovation, that has been discussed in the diffusion of innovation literature (Rogers 2003). Moreover, the research shows that considering an ideal vision for a systemic change (Carr-Chellman 1998, 373) as an idea only innovation (Rogers 2003, 13) comes in handy for both: diffusion of idea only innovations can be analysed as "the ultimate goal of an ideal vision of the *whole*" (Carr-Chellman 1998, 373), which suggests a novel application for the theory, whereas an ideal vision of a systemic change benefits from analysing the innovation-decision processes (Rogers 2003, 169—192) among implementers to depict mechanisms for change. Findings in regard to the innovation-decision process of an ideal vision for systemic change also elaborates design research on appropriation of design outcomes (e.g. Björgvinsson et al. 2012; Verganti 2009; Dervojeda et al. 2014): that there are extra-collaborative design factors (beyond producing design events) such as long-term contextual involvements to be taken into account, because they affect the quality of involvement.

In regard to systemic change and design, this research presents an initial framework for assessing systemic change with collaborative design. Hence, this research builds on a research body that has earlier

involved only descriptions of activities and kinds of tool boxes for systemic change (e.g. Murray et al. 2010; Simon 1996; Thackara 2005) but not a proper conceptualisation of how to assess the broadness and scale of systemic change, and how collaborative design can involve such a complex problem.

As the final implication of assessment, I present that design does not need to find new, more prolonged organisations and discard projects as a plausible means for design activities as has been suggested (e.g. Björgvinsson et al. 2012), but the decisive factor is how constraints of project work are overcome with linking participants' agency in the real world. When looking at the findings of this research from the viewpoint of managing innovations, systemic change with collaborative design does not require huge constellations of people or longitudinal endeavours but projects could be seen as spurts that are agile and temporary platforms for negotiating reinitiation. Different durable milieus such as design discourse (Verganti 2009), living labs (Björgvinsson et al. 2010), and research programs (Koskinen et al. 2012) of course support facilitation of systemic change by channelling resources, establishing mutual language and providing a ready platform for exploration, but, the point in here is that they are not necessary. Hence, very short-termed collectives such as projects presented in this dissertation may propel significant and long-term systemic change. Projects can be seen as relatively light and resource-wise practical means to deal with complex systems when framed carefully with a particular perspective, and linked to real people who would be motivated to implement change acknowledging the hierarchical structures of a complex system. Moreover, it seems that if the main ownership of an endeavour belongs to the representatives of the subject field, it more likely builds commitment and long-term impacts. Based on this research, I claim that facilitation of systemic change with design can be done from within a project and it can enable change and strengthen commitment to continuous development in the subject field.

8.2 REFLECTIONS ON THE RESEARCH PROCESS

This research has examined facilitating systemic change with collaborative design, particularly in the context of Finnish repair construction based on a longitudinal case study. The evidence covers multi-method analysis of transformation towards resident-oriented modernisation in a timespan of seven years. The evidence does not cover diffusion of the innovation resident-oriented modernisation at the whole field of Finnish repair construction although, according to interviews, this had much wider effects that have been only partly described in the story. Neither does the descriptive and exploratory study aim at explaining the determining factors, the mechanisms or the causal relations between design and impacts but it instead involves following developments based on a

particular design-related project and, by that, shedding light to the long-term outcomes of collaborative design beyond the specific project.

The main challenge for me in conducting this research has been in trying to find a balance between the personal experience and the research material. I have prioritised the 98 project documents, the 63 interviews and the 136 documents over my personal experience so that I would not have dismissed the opportunity to reflect practical actions in a project within a large context. I have, particularly, tried to be explicit in using different materials. Personal experience has primarily helped to immerse into the research topic, to pose questions for the research material and sometimes given a background against with it has been easier to understand certain occurrences found in the research material.

Due to my personal involvement, however, one might wonder whether I have pushed my personal agenda in the analysis. I admit that I am a firm believer in user-orientation and collaboration when it comes to defining and solving complex problems. Without this viewpoint, IKE would have been different and, I presume, also the analysis might have emphasised different aspects. This is a limitation that stems from the fact that this research has been a combination of material-based analysis and reflection-on-action based on personal work experience. With this approach, some sort of emphasis on personal interests cannot be absolutely avoided because also the research subject has its origin, at least partly, in my experiences. To avoid bias, I have, similarly to identifying different materials, tried to be explicit in telling the story in detail from differing perspectives to achieve richness, completeness and depth of a case study.

IKE was chosen to act as the project based on which I constructed my research because it was considered a 'successful' project. Also here I have aimed at describing the project participants' feedback carefully without over-emphasising an aspect over another. The project was successful in that it inspired a large variety of developments in Finland based on a shared vision. It was also the original aim for the preliminary study. However, as has been discussed, particularly in chapters 6 and 7, I must not have contented myself with 'a success story' but I have examined the completeness to find variance in the reactions; while some became committed to reinvention, others rejected the innovation. This has been my way to trace the determining factors between collaborative design making and impacts in such a way that it would help to understand the value of this kind of activity.

Careful analysis also on Finnish repair construction has been unavoidable in order to have been able to depict the boundary between the context and the actual case. That said, the findings do not concern Finnish repair construction in general but the systemic change is situated in the field. Even though I have described some developments and repair construction professionals' role in them quite in detail, the reader

should not draw conclusions on other project participants' skills and contributions in the project in total. Although the general process has been described and I have discussed their roles in the project to better understand the contribution of design, I have not covered all the possible aspects that could have affected the 67 participants' role in the project and following developments.

In regard to the case study, there are possible limitations if one should conduct a similar case study in another context. Firstly in regard to the context, there are differences in professional fields, and also country and culture may pose considerations. Particularly in Finland, we have public-private partnerships that involve quite equal engagement in developing societal issues that may not apply in other countries.

Secondly in regard to practical execution of collaborative design in IKE, as is often general in design, personal sets of skills were involved that affected the way of working. Even though the general approach, process and tools have been described, the particular working style has assumably affected the totality of findings that could not be repeated in another research even if the setting would be similar. Moreover, the collaborative design approach has been developed after the project was conducted and therefore if the research would be repeated even by the same design researchers, the findings could be somewhat different. However, the analysis does not focus on particular working methods but the methods that have been described are primarily used as a point of reference in depicting the contribution of collaborative design in following change at repair construction. Therefore, even if the story would be based on a different set of methods based on the current knowledge, it should only affect some nuances because I have aimed to describe the main results in such a generalisable level that it should not affect the contribution of this research.

8.3 WHERE DO WE GO FROM HERE

This dissertation was one of the first of its kind, possibly the first, to examine the contribution and position of collaborative design in systemic change. Therefore, the research was an explorative case study that may have raised more questions than it answered. One may wonder how much we actually know about the mechanisms affecting systemic change in regard to facilitating with collaborative design. Another aspect is to decide how far we should go with our follow-up studies, is it enough to follow development for seven years as I have been doing in this research or should we take even a longer period or wider inclusion into examination. Additionally, one may question how well these learnings can be diffused to practical design work that is often contextual and qualified by pragmatic considerations instead of academic knowledge.

My way of dealing with the growing amount of questions that has risen during the years of conducting this research is very much *designerly*. I have thrown myself into practical development work along with other people who invested in reinvention of the innovation resident-oriented modernisation. Based on the early findings in this dissertation it was evident that the field needed more support in transforming toward resident-orientation and capitalising on services particularly so that disciplinary, organisational and domain boundaries would be crossed in a constructive manner. In the project Suburb 2072 me, company Vahanen and Juha Salmi re-united our forces and invited new partners to explore how to exploit the inevitable and also unique momentum of suburban renovation to achieve wider effects for sustainable and ethical development with the means of collaborative design (D097; D101; D111; Dhima 2014). Its little sister, with the same name, was organised as part of the Aalto University's Helsinki World Design Capital 2012 project where we explored with design students, local people in the suburb of Mellunkylä, and City of Helsinki urban developers how to co-create positive visions for suburban future based on a combination of trend forecasting and collaborative design approaches (D090—092; Soini & Paavilainen 2013). In these projects we allied with the local residents and activists, people and organisations that make their living somehow in relation to the issue and also the top politicians in Finland to advance our agenda. Our agenda transformed during the process from seizing the momentum to enabling a new positive and proactive culture at renovation where people can bring in their capabilities to work together for the better future.

Based on my practical and academic experience, the next question at activities relating to renewal of the existing built environment seems to deal with facilitating systemic change in regard to induce service business that is particularly timely subject in design research literature (e.g. Sundbo & Toivonen 2011). Construction industry is one of those domains that is traditional and progresses slowly but would need renewal to meet the diversifying needs of residents, to sustain the affluent society and to improve competitiveness. Based on the findings in this dissertation, professionals and organisations participating in IKE awoke to the reality that service-orientation is a feasible differentiation method, but the premises such as attitude and culture, fundamental capabilities, offering and business logics would need much more progress in which research on collaborative design again could contribute.

Another question in the regeneration of the built environment relates to the question of locality. There are many different approaches presented that emphasise the role of rooted actors in innovation and revitalisation of certain neighbourhoods, including examples from design (Dhima 2014; Manzini 2010; Murray et al. 2010), communicative urban planning (D134; Majamaa et al. 2008), and their combination (e.g. Botero 2013; Saad-Sulonen 2014), and local innovation agglomerations

(Kostiainen 2007; Verganti 2009). These aspects presented in this dissertation about facilitating systemic change could be further researched in relation to the existing built environment, especially now when the growing amount of renovations are concerning neighbourhoods and suburban areas.

Another natural continuation for the assessment of collaborative design in dealing with systemic change could be to conduct comparative case studies that would, in time, build a research body to explicate collaborative design's contribution based on which several conclusions and justifications could be drawn, for example, in regard to return of investments (ROI), the national innovation system, or competitiveness, prosperity and well-being of even larger entities such as the EU (dROI 2012; European Commission 23.9.2013; Thomson & Koskinen 2012).

Often innovation research focuses on more concrete design objects but, due to recent developments in societies and environment, applying design in solving more complex problems is increasing. Now that this dissertation suggests a tentative procedure for assessing collaborative design of complex systems, it could be applied to elaborate means to indicate collaborative design's instrumental value for progress.

This could be further supported with more detailed research on causal mechanisms such as social mechanisms where longitudinal research material with relational material is also essential to explain individuals, their relationships, and their actions (Hedström & Ylikoski 2010). For example, the innovation-decision processes could be investigated in conjunction with social mechanisms to better understand the reasons for behaviours and to find reasonable practical means to facilitate change.

Questions can be raised on where do we go from here, and I am happier the more questions this book has evoked in you. I presume, whatever path you will choose, that issues dealing with systemic change where "the dance of the big and the small entails a new kind of design" (Thackara 2005, 226) will require some sort of in-depth ways of working, possibly research-orientation, even if one would involve practical development work. The difficult, wicked nature of these problems cannot be light-heartedly solved but requires careful consideration, mindful action and long-term commitment.

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and appendix

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I02   Chairman of the Board Risto Vahanen, Vahanen Oy, 30 May 2007.

I03   Managing Director Kimmo Rönkä, Movense Oy (Director of Future Home
        Institute, University of Art and Design Helsinki during IKE), 7 June 2007.

I04   Building Counsellor Erkki Laitinen, Ministry of the Environment, 8 June
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I05   CEO Juha Salmi, Image Builder Oy, 3 March 2011.

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        Institute, University of Art and Design Helsinki during IKE), 4 November
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I10   Shareholder Resident, As Oy Dwelling, 18 May 2007.

I11   Shareholder Resident, As Oy Dwelling, 21 May 2007.

I12   Shareholder Resident, As Oy Planning, 21 May 2007.

I13   Shareholder Resident, As Oy Construction, 21 May 2007.

I14   Shareholder, Housing Company Board Member Resident, As Oy Construction, 21 May 2007.

I15   Resident (Shareholder Resident, As Oy Dwelling during IKE), 21 May 2007.

I16   Resident (Investor Resident, As Oy Construction during IKE), 21 May 2007.

I17   Shareholder, Investor Resident, As Oy Construction, 22 May 2007.

I18   Pensioner Seppo Räty (Development Manager, Talokeskus Oy during IKE), 22 May 2007.

I19   Shareholder, Housing Company Board Chair Resident, As Oy Planning, 22 May 2007.

I20   Resident (Shareholder Resident, As Oy Planning during IKE), 23 May 2007.

I21   Building Manager Arto Huttunen, Tapiolan Lämpö Oy, 23 May 2007.

I22   Building Manager Anssi Timonen, Isännöitsijätoimisto Kehäykkönen Oy, 23 May 2007.

I23   Real Estate Manager Marita Laakso, VVO Oy, 23 May 2007.

I24   Research Manager Jorma Puttonen, Taloustutkimus Oy, 23 May 2007.

I25   Resident (Shareholder, Housing Company Board Chair Resident, As Oy Construction), 23 May 2007.

I26   Foreman Jari Kosunen, Uudenmaan Mestari-Rakentajat Oy, 23 May 2007.

I27   Resident (Shareholder, Housing Company Board Chair Resident, As Oy Dwelling), 23 May 2007.

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I32   Shareholder, Investor Resident, As Oy Planning, 24 May 2007.

I33   Project Manager Sami Hentilä, Procofin Oy (YIT Oy during IKE), 24 May 2007.

I34   Administration Manager Riitta Salo, Sato Oy, 25 May 2007.

I35   Shareholder Resident (Housing Company Board Member during IKE), As Oy Planning, 18 May 2007.

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I38   Realtor Kai Ahotupa, Comreal Oy. 25.5.2007.

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INTERVIEW QUESTIONS IN 2007

The 45 interview questions were individualised for the three different roles in the project, namely project and steering group members, invited participants and informants. Each interviewee was asked between 21 and 37 questions according to their roles in the project. The same set of questions was also used as a loose script for the four key players in addition to more open discussions.

OVERVIEW OF THE IKE PROJECT

1. What is the first thing that comes to your mind when you think about the IKE project?

2. What were the results of the project in your point of view?

3. What kind a link is there today between you, your organisation / housing company, and the project?

THE IKE PROJECT METHODS

Contextual interviews

4. You were interviewed in the IKE project about the replumbing project of As Oy Planning / Construction / Dwelling in autumn 2004.
What do you recall about this interview?

5. What kind of a role did you have in the interview?

6. What did you gain from the interview?

7. How did the interview benefit your housing company / organisation?

Project group

8. You were a member in the project group.
What do you recall, what kind of project group work was there in this project?

9. What kind of a role did you have in the project group work?

10. What did you gain from the project group?

11. How did project group work benefit your organisation?

Henceforth, a similar set of questions was asked about each project activity by only altering the name of the activity (e.g. steering group), rephrasing the question according to the role in the project ("you *organised*" or "you *attended*"), and referencing to *organisation* or *housing company* according to the social grouping.

Focus group, questions 16–19

Design probes, questions 20–23

User experience workshop

24. You organised / You attended the user experience workshop of As Oy Planning in December 2004 / As Oy Construction in January 2005 / Dwelling in February 2005 at the University of Art and Design Helsinki. What do you recall, what kind of activity was there in the workshop and what was achieved?

25. What kind of a role did you have in the workshop?

26. What did you gain from the event(s)?

27. How did participating in the workshop(s) benefit your organisation / housing company?

Synthesis workshop, questions 28–31

Practices

32. What you particularly recall from all the activities you participated in during the IKE project?

33. Have you applied or developed some of the methods in your organisation / housing company?

OWN WORKING COMMUNITY / HOUSING COMPANY AFTER THE IKE PROJECT

Job description / positions of trust and know-how

34. Have you had new tasks or job description / positions of trust as a consequence of the IKE project?

35. Have you felt a need to educate or develop yourself?

36. Do you have new professionals, partners or tasks / areas of responsibilities in your organisation / housing company as a consequence of the IKE project?

Projects and initiatives

37. Do you have in your organisation / housing company any projects / renovation and development projects running, prepared or finished that you interpret to be based on or follow from the IKE project (name, time, objectives, outcomes, stakeholders)?

Setbacks

38. Do you know an idea that was created in the IKE project that has not been developed even though you would have wanted to?

39. Have you noticed that an idea that was created in the IKE project has been difficult to advance?

40. In your opinion, what is the reason that developing and advancing has been difficult?

SUMMARY

Mindsets

41. When you think about it now, whose project was IKE?

42. Is there a thought or an idea in the IKE project that you still want to foster?

43. Describe with your own words: what does resident-oriented housing modernisation mean.

44. In conclusion, how would you describe the IKE project and its impact?

Other

45. Here are all the questions I wanted to ask. Do you want to add something?

ABSTRACT

Collaborative design can deal with open-ended and complex systems. Its aim is to collectively create proposals for alternative futures, and bring value for people, organisations and society alike. So far the research on collaborative design has primarily focused on methodical development. Less attention has been focused on long-term examination of connections between design and appropriation. The present dissertation focuses on this research gap by providing an empirical view on the contribution of collaborative design in systemic change.

This dissertation is a longitudinal case study. It addresses Finnish repair construction as a complex system, its systemic change, and the contribution of a collaborative design project in the change. The research material consists of project documents, follow-up interviews, documents on following developments, and the author's personal experience in the project. The multi-method analysis builds an in-depth narrative of the systemic change and the contribution of design within a timespan of seven years between 2004 and 2011.

The analysis shows that the systemic change of repair construction refers to a paradigmatic transformation from technical orientation towards an ideal vision of resident-oriented housing modernisation in several levels of the system. The vision was created in the IKE project in 2004 and 2005. IKE was a preliminary study commissioned by the Finnish Ministry of the Environment to define the development requirements for repair construction. The project applied collaborative design to explore and envision repair construction. Empathic and participatory approach joined multi-disciplinary project participants including residents, repair construction professionals and design researchers.

The research shows that the vision built commitment to long-term change in repair construction. By 2011, the vision was adopted as an idea innovation by nearly seventy percent of the project participants. The field had started to shift its focus on residents in addition to the housing company board. Replumbing was becoming reinterpreted as a service business. Additionally, a need for long-term maintenance culture of the built environment was arising. The vision was applied in fifty development projects and solutions in private and public sectors. The research illustrates commitment to change in individual, organisational and governmental levels. The three main streams of development following the ideal vision involve resident-orientation as a novel criterion for repair construction, investment in developing repair service offering, and resident-oriented housing modernisation in building policy.

The contribution of collaborative design in the systemic change of Finnish repair construction resides in facilitation. Facilitation with collaborative design in the IKE project involved 1) producing various occasions for stakeholders to participate exploration and envisioning, 2) establishing reciprocal empathic encounters between residents and repair

construction professionals, 3) producing experiential material for reflection between the everyday and society, and 4) reifying the ideal vision with visualisations and storytelling for later use. The term *facilitation* represents the contribution and position of collaborative design. Facilitation positions collaborative design in change: design did not initiate or implement the change, but rather responded to the professional practitioners' need for establishing a shared starting point for change. The contribution of design was to enable consistent transformation in the field by providing means to simultaneous innovation creation and adoption.

The research provides insights on facilitating systemic change to scholars and practitioners of collaborative design and repair construction alike. The book presents an account of the recent history of repair construction in Finland.

TIIVISTELMÄ

Yhteissuunnittelulla voidaan kehittää avoimia ja monimutkaisia järjestelmiä. Sen tavoitteena on luoda vaihtoehtoisia tulevaisuuskuvia, jotka tuovat arvoa yhtälailla yksilöille, organisaatioille kuin yhteiskunnalle. Yhteissuunnittelun tutkimus on tähän mennessä keskittynyt lähinnä menetelmien kehittämiseen. Vähemmälle huomiolle on jäänyt sen hyödyntämisen yksityiskohtainen ja pitkäaikainen arviointi. Tämä väitöstyö esittää empiirisen näkökulman yhteissuunnittelun panoksesta systeemiseen muutokseen.

Väitöstyö on pitkittäinen tapaustutkimus. Työssä tutkitaan empiirisesti suomalaista korjausrakentamista monimutkaisena järjestelmänä ja sen systeemistä muutosta sekä erään yhteissuunnitteluhankkeen roolia muutoksessa. Tutkimusaineisto koostuu projektidokumenteista, seurantahaastatteluista ja muutoksiin liittyvistä dokumenteista sekä tekijän henkilökohtaisesta kokemuksesta projektityössä. Monivaiheisen analyysin tuloksena väitöskirja kuvaa systeemistä muutosta ja muotoilun panosta seitsemän vuoden ajalta vuosina 2007—2011.

Analyysi osoittaa, että korjausrakentamisen systeeminen muutos tarkoittaa alan käännettä teknisestä painotuksesta kohti yhteistä tavoitetta—asukaslähtöistä perusparantamista—järjestelmän useilla tasoilla. Yhteinen tavoite luotiin IKE-projektissa vuosina 2004—2005. Projekti oli Ympäristöministeriön rahoittama esiselvityshanke, jonka tavoitteena oli määritellä suomalaisen korjausrakentamisen kehitystarpeet. Projektissa sovellettiin yhteissuunnittelua korjausrakentamisen tarkasteluun ja visiointiin. Empaattinen ja osallistuva ote edesauttoi monialaisten projektijäsenten kuten korjausrakentamisen ammattilaisten, asukkaiden ja muotoilututkijoiden yhteistyötä.

Yhteinen tavoite edisti sitoutumista korjausrakentamisen muutokseen pitkäaikaisesti. Vuoteen 2011 mennessä miltei seitsemänkymmentä prosenttia projektiin osallistuneista oli omaksunut tavoitteen. Ala oli alkanut huomioida asukkaat asunto-osakeyhtiöiden hallituksen lisäksi. Putkiremontti alettiin nähdä palveluliiketoimintana. Lisäksi asuntokannan pitkän aikavälin ylläpitokulttuuri oli syntymässä. Tavoitetta sovellettiin viidessäkymmenessä kehittämishankkeessa ja ratkaisussa yksityisellä ja julkisella sektorilla. Tutkimus kuvaa muutokseen sitoutumista yksilöiden, organisaatioiden ja valtion hallinnon tasoilla. Kolme yhteistä tavoitetta seuraavaa pääkehityskulkua ovat: asukaslähtöisyys korjausrakentamisen uutena kriteerinä, investointi palvelutarjonnan kehittämiseen, ja asukaslähtöinen perusparantaminen valtion hallinnossa.

Yhteissuunnittelun panos suomalaisen korjausrakentamisen systeemiseen muutokseen on fasilitointi. IKE-projektissa fasilitointi tuotti 1) tilaisuuksia, joissa osallistujat saivat osallistua korjausrakentamisen tarkasteluun ja visiointiin, 2) kohtaamisia asukkaiden ja korjausrakentamisen ammattilaisten kesken, mikä synnytti vastavuoroista empatiaa, 3) kokemusperäistä aineistoa, joka tuki pohdiskelua arjen ja yhteiskunnan

kysymysten välillä, ja 4) kuvallisen ja tarinallisen kuvauksen yhteisestä tavoitteesta. *Fasilitointi* terminä kuvaa yhteissuunnittelun panosta ja asemaa muutoksessa. Fasilitointi sijoittaa yhteissuunnittelun muutosta tukevaksi toiminnaksi, korjausrakentamisen ammattilaisten vastatessa muutoksen aloitteesta ja toteuttamisesta. Yhteissuunnittelu mahdollisti johdonmukaisen muutoksen korjausrakentamisessa. Se edisti erityisesti hankkeen aikaista rinnakkaista innovaation luomista ja omaksumista.

Väitöstyö tarjoaa näkökulmia systeemisen muutoksen fasilitointiin tutkijoille sekä muotoilun ja rakentamisen ammattilaisille. Samalla kirja luo katsauksen suomalaisen korjausrakentamisen lähihistoriaan.

This dissertation presents an in-depth narrative about the systemic change of Finnish repair construction between 2004 and 2011. During the years, the field transformed from technical orientation towards resident-oriented housing modernisation. Repair construction used to borrow its criteria from new building construction, but now the field started to build its own culture and shifted its focus to residents, service business, and long-term maintenance. While repair construction professionals initiated and implemented the change, collaborative design facilitated consistent transformation through empathic exploration and collective envisioning. The research provides empirical view on the contribution of collaborative design in systemic change—which brings value for people, organisations and society alike.

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