The Benefits of Involving Older People in the Design Process

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Abstract. The more experience we get of involving older people in innovation and design processes, the more we recognize the benefits of having to do with life experience as input to the development of digital products and services. Heterogeneity raises personalization as a key component in design. This paper argues that old people are an asset in innovation processes, which is illustrated by projects conducted in Sweden from 1992 to 2014. The aim is to present how older people contribute to the development and what hinders them. The goal of these projects was to promote participation of older people during the design process but to varying degrees depending on the question. Different degrees of participation and involvement are discussed based on the "participation ladder", on an idea of Arnstein from 1969 and on conclusions from innovation research.

Keywords: Life experiences · Participative design · Older innovators

1 Introduction

Aged, older, elderly – what do we call those who have reached old age? Depending on our understanding of old age it makes a difference when designing for and with old people. The problem is that aging and later life is still too little problematized compared with the technology being tested [1, 2]. While technologies has shifted over the years from easy-to-use interfaces, GPS support and alarms to robotics and systems for monitoring, the image of old people remains more or less the same. According to stereotypes, old people are socially isolated and lonely, and they experience physical and social losses that are to be compensated for by cleverly designed technologies.

The purpose of this paper is to add leverage why involvement of older users in design is beneficial. Not only do their contributions result in more accurate solutions and lead us faster towards the goal, they also make design more innovative and help preventing prejudices and stereotypes. I will present conclusions from innovation research to back up these arguments and illustrate various degrees of participation with examples from Swedish design projects.

1.1 Design for Whom

Looking back at funding schemes for research and development of technology for old people during the last thirty years, the expectation that technology is the driving force

for change is pretty obvious. The European Commission, for example, expect the framework programs to meet a range of presumed needs among the older population, and to manage the increased costs of health care and social services. Their argument for the IT society is evident from the beginning – older people have much to gain from an increase in communication and access to information [3]. Recently, the issue has taken a turn in the EC. 2012 was proclaimed as the Year for Active Ageing. The purpose was to highlight reforms for helping people to stay in charge of their own lives for as long as possible as they age and, where possible, to contribute to the economy and society [4]. The WHO report before World Health Day 2012 took another step when launching the call for "Adding life to years" by connecting a longer life with participation and attitudes [5]. These are steps which make a difference for designers, when trying to understand how to enhance later life for ageing populations. The step takes us away from the image of the elderly as a single homogeneous group, whose needs can be generalized to apply to all elderly people, to a more nuanced picture.

It is true that ageing populations increase. Between 2000 and 2050, the proportion of the world's population over 60 years will double from about 11 % to 22 %. The absolute number of people aged 60 years and over is expected to increase from 605 million to 2 billion over the same period [5]. It is also true that the total fertility rate 2006 was below its replacement level in all OECD countries except Mexico, Turkey, Iceland and the United States [6]. These numbers probably indicate that there will be an increase in needs for health care and social services as the consumption of health care services increase with age. But it does not reflect the fact that the majority of older populations continue their life course as independent citizens without incorporating the role of being a patient or a care receiver as a part of their identity. This is obvious at least when it comes to Swedish statistics. In Sweden, this group constitutes less than 20 % of the population over the age of 60. They encompass those receiving public health care and home help services provided by public or private enterprises (8.2 %) or those living in nursing homes (7.5 %) [7]. Relatives and friends also perform services, which in Sweden covers 75 % of the total caring needs [8]. The question of how to measure this is an ongoing discussion. Municipalities are obliged to give anyone who needs help. However, the fact that more than 80 % are not patients or care receivers seem to be a hidden secret. The dominating image of old people as a homogenous group with similar needs and demands has for a long time been the prevailing notion. The consequence is that older people become characterized in political documents as well as in media in terms of disease, incompetence, stagnation and decline [9]. Traditional images of aging based on perceptions of needs that have been institutionalized for a long time were partially obsolete already in the 1990s. Even today few players have been able to capture the demands of old people living a modern life [10]. The outcome is that even those in need of home help services or living in nursing homes are minorities – yet they still define the stereotype for the entire aging population. These stereotypes are limited because they focus on aging as a downhill process by physical and social loss and they frame older technology users as passive recipients of technology. Current design practices for older persons, therefore, imply a threefold risk. They are likely to generate technology which is unattractive for older consumers, which provides limited cues for

meaningful activity, and which suppresses the co-creational inputs of older persons to innovation [11]. The good news is that we are now at the frontier between the old and new images of aging.

Today, more and more designers experience that these stereotypic images crack when old people themselves are let into projects as participants. When fictive older users are replaced by real older users, you quickly discover that this is about a diverse group of people characterized by heterogeneity. The categorization of older people as a homogeneous group is quickly replaced by a more individualized approach. In fact, longitudinal research shows that individual differences increase with age [12]. This means that forty year olds are more homogenous compared to eighty year olds. However, the heterogeneity among older people does not mean they do not have common features. It has been suggested that retirement may be one thing they have in common as it involves a new social arena with other expectations from themselves and society. Other common experiences may be that they are among the oldest in the community and thus have life experiences that younger lack, which has been shown to influence their priorities including when it comes to new technology. To be treated like old can also be a shared experience as well as generations of old people may have lived through the same historical events [13].

1.2 Design to Change Attitudes

Older people have a history of being invisible. Even though the images of old people are changing it is still relevant to state that they are neglected as users and consumers of new information and communication technologies [14]. Lay end users is a concept that was introduced to differentiate between those involved and not involved in the expert discourse as a part of the design process [31]. Implicated users is another concept, where users are defined as "those silent or not present but affected by the action" [15]. These implicated users consist either of those who are physically present but discursively constructed and targeted by others, or of those who are physically present but who are generally ignored or made invisible by those in power. Old people belong to both these groups. They are definitely present but often as a discursive construct, not as participants.

One reason why it is important to give the elderly more opportunities to express their own needs and desires is that this is strongly related to influence and visibility. Designers can thus affect significantly and accelerate the change in attitude to the elderly. A thought-provoking parallel could be drawn to women's struggle for power over the situation. The author Betty Friedan compares the view on women in the 1970s in the United States with the current view on older people [16]. She discovers that there are no images of aging she can identify with. When older people are described, it is always relative to others, especially to those who are active and productive. It's always someone else who defines the problems, not the aging man himself with his experience. This was also the situation for women, whose experiences long lacked a name or an expression. Friedan describes how experts' awareness and identification of older people's needs and problems are as invisible as when men previously identified women. The change came when women themselves began to articulate their own problems and experiences.

One challenge is to reinforce the view of older people as active, involved and experienced and broaden their roles beyond being patients and care receivers. The shift from considering users as passive objects of research to giving them a role as active and pro-active innovators include concepts such as "universal design" and "empowerment" [17]. These concepts were coined in the context of disability research that paved the way for a broader, non-discriminatory view but also a deeper understanding of how design contributes to improved quality of life. Eric von Hippel launched the concept "lead users" to show that the user is the carrier of the aspects necessary for the innovation process [18, 19]. This has now been replicated in a number of concepts related to the aging population and digital development. These include "personalization" [20], "social needs" [21], and "the innosumer" [11].

2   Method

Depending on whether one considers users as objects or as subjects, they get different roles in the design process. Using them as research objects, the designer is seeking generalizations to be applied in design. As a subject they participate themselves in design and development. Moreover the domestication of new technologies in people's life spaces is far from predictable. The fact is that it is when technology comes into the user's hands and is contextualized that its real value turns out [22, 23]. Including user's home or daily context takes us closer to reality, meaning discovering unpredictable aspects and innovative ideas. Depending on what we want to achieve, what steps users themselves are willing to take or are already taking, their participation will be high or low. The choice of method is determined by the question, and in turn, the extent to which we give users the opportunity to participate. Active citizens are in a sense a prerequisite for the development of society in general, but a conscious choice of methods provides greater opportunities to go further with projects. When users are involved in the development of technology, it means that they will be jointly responsible for the results, they will better understand the consequences and may for these reasons continue to contribute to improvements.

2.1   How to Make Them Participate

One way to illustrate the degrees of participation is the participation ladder [24]. This is a ladder developed in the context of housing planning in the US in the 1960s to illustrate the degree of participation of citizens in the planning process. Today, we can use this ladder both as a mirror to understand on what step we ourselves are collaborating with users and as a framework for different options of participation. See Fig. 1.

The ladder can have many steps. Arnstein split the steps into three categories of participation. First, complete citizen participation and influence by the citizens perhaps on their own initiative. An example is if you belong to a group that has initiated a senior housing to be built. The second step, symbolic participation, includes consultation and information. This is probably the step where most design activities take place and where we invite people to test prototypes. The lowest level, non-participation,

Citizen participation
Citizen control
Delegated power
Partnership

Symbolic participation
Consultation
Information

Non-participation
Treatments
Manipulation

Fig. 1. The participation ladder on an idea by Arnstein (1969)

requires a pretty passive user. However, this should not be interpreted only in negative terms. General information to households, for example, is very important at certain stages. The term manipulation is however what we should avoid since it runs the risk of violating ethics and human rights.

3 Examples of Design for Various Degrees of Participation

This ladder will illustrate the degree of user participation in relation to the kind of results obtained in the Swedish design projects presented below. The projects were part of the Ageing and design program at the Department of Design sciences at Lund University 2005–2014, except for the project about Home shopping terminals that were part of the research at The Institute for Tema Research at Linköping University 1992–1995. The projects were different in their goals and nature but followed the leading principle to include older participants in every project. Here we worked with five steps to clarify the choice of methods. The lowest step will not be exemplified since we lack such project examples (Fig. 2).

3.1 How Can We Get Access to Products and Services We Need?

The first example illustrates older people as co-actors driving the changes they want to accomplish. In a project initiated by a group of fifteen women, 63–69 years old, the purpose was to investigate available services in the local neighbourhood directed

1. Older people are co-actors and are themselves driving the changes they want to accomplish.

2. Older people participate as the experts on their own life situation.

3. Older people contribute with their own views in consultation together with others.

4. Older people recieve information and/or being the subject to different types of operations.

5. Manipulation – people are objects for other's actions.

Fig. 2. Levels of participation distributed on the idea of the participation ladder (Arnstein 1969)

towards independent older people living at home in the city of Stockholm and the possibilities of organizing local networks in which they were involved themselves in the performance of services. The older women noted early on that they lacked access to adequate services and were particularly critical of the municipal elderly care service: They realized that it was not the old people's needs, but rather the service provider's priorities which governed the supply of help they could receive. Nor did the commercial market offer the services they wanted to purchase. They were in particular interested in the access to information and the potential of IT-development including both hardware and software.

The assessment ran from September 2007 to May 2008 and included working meetings, focus groups and a workshop on technical design. The workshop was organized with expertise in industrial design, electronics and construction of computer systems. Individual examples and ideas were discussed and requirements were specified. The most important requirement was to keep the power to interpret the needs and demands within the group.

In summary, the participants came to the conclusion that the services available today primarily address old people who are vulnerable, ill and chiefly require help with household matters. The study results suggest the need for the public care sector to re-evaluate their supply and better assess changes in demand. There is also room for the development of various forms of services and business models that better match the needs and demands of independent older people. Access to information was discussed

as necessary to become an active consumer. However, none of these products existed at that time in the way the older people wished. The phone appeared to be a simple and accessible way to communicate but was no longer optimal for everything due to automated, key pressing systems for delivering information, a variety of interfaces and mobile phones. Access to the Internet was still troublesome for them and they felt marginalized when they heard on TV that, "The information is available at www. . . ." announced at television or in papers. The women responded specifically to the fact that their experience of using technology was not taken advantage of. Neither were they attracted to use 'phones for the elderly "because they found that this could be stigmatizing. They were also disappointed of how phones in general were designed. They concluded that these products had hardly been tested before they were labelled as being products for older people.

As a result, they organised a telephone based network to support each other in various ways in the local neighbourhood. Besides the network this endeavour show that there is a lack of services demanded by old people and that the nature of these demands can only be understood from their point of view.

3.2 Will New Technology Based on Existing Habits Increase Acceptance and Use?

The second example is about older people as experts of their own life situation. In another project with eleven older users, 57–80 years old, the purpose was to study the extent to which older people's lifelong experience of watching television reduced their uncertainty when faced with new TV-based applications. The project was initiated by a research group in collaboration with a company: In view AB (later ippi AB). In view AB provided the project with a patented system for asynchronous communication – "ippi" – used as a basis for a prototype communication device utilizing the participant's television as the primary interface. See Figs. 3 and 4.
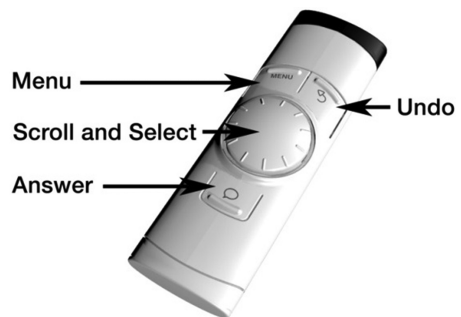

Fig. 3. ippi[TM]

Fig. 4. The ippi remote control with wheel button

The implementation and testing of the system were structured as an iterative design process based on the necessity to get access to users' daily context and TV-habits to understand the potential of the prototype. The implementation included conceptual development, a six-month test period in the homes of eleven users with usability tests and interviews, monthly focus groups and information gathered by a backup function that also provided the users with immediate help with the technology if necessary.

The results show that while the use of TV as a metaphor or platform succeeded in getting the older users to try out and use the ippi prototype, it did not contribute primarily to using the ippi on a daily basis during the test period. Rather, participants' access to a social context or a social network determined the extent of usage. There was a difference between what was easy to use in terms of the interface, and what was easy and worth using in a social everyday context on the other hand. In order to be used, a new product of this type must add value and that value depends upon integration into daily communication [25]. This is the kind of "sticky information" that von Hippel ascribes to users and which can be obtained only in relation to the users themselves and their daily context [26]. The length of the tests at home also was of considerable importance to understand the role of technology in relation to established routines and habits.

The product is today used in about 25 local communities in Sweden. However, since the public market for these kinds of products is still quite undeveloped the company sold the product to Care Communications AB and we do not have information about its future.

3.3   What Are the Preferences for Furniture Among Older Consumers?

The third example describes older people contributing with their views in consultations. A sub study of the PLUS-furniture project conducted 2008–2010 was a laboratory test where thirty men and women, 57–87 years old, tried out furniture, more precisely to evaluate properties and characteristics of chairs [27]. The PLUS-furniture project including seven Swedish furniture design companies aimed at exploring the use of furniture and activities among the older population. The background was a common interest in The Swedish Wood and Furniture Industry Association and the Department of Design Sciences at Lund University to investigate older people's preferences for furniture for their own use at home. The demographic trend of a growing elderly population, many with good economy, was well known. However, there was no knowledge about their preferences as furniture consumers. The IT-aspect was stressed both as a part of furniture and as a part of the situation where the furniture is used, however, it was not discussed in the sub study presented here.

One part of the project was to evaluate furniture on the market. The choice to study chairs was motivated by the fact that it was the type of furniture most frequently mentioned in a previous study. Also, chairs are the most frequently used furniture type and the most common purchase for nursing homes [28]. However, it was the older individual consumers that were in focus as companies identified them as an unknown group of customers who do not just represent a growing percentage of the population but, above all, are more active, healthier and have greater purchasing power than previously and who do not want products that communicate aging and helplessness.

The study was conducted in a usability laboratory with chairs that the companies picked out themselves based on their assumptions of what older consumers prefer. A method for evaluating user satisfaction through structured interviews was used to highlight participants' interaction with furniture in a systematic sequence of human-product interaction. For example, the systematic sequence comprised items such as looking at, ingress into, sitting in, egress from and moving the chairs.

The results showed that the participants displayed different needs of and wishes for comfort. The participants shared an appreciation for chairs with properties and characteristics suiting their bodies, homes and desired identities.

The companies integrated part of these results in their design and marketing. To test a selection of chairs in a laboratory proved to be a relevant match, and answered questions about sitting, egress and moving the chair. The results however suggest that the designer should consider the experience of comfort and previous experience with similar furniture, data which requires access to user context outside the laboratory [27].

3.4 Trying to Impose the Visions of IT-Society on Older Care Receivers

The fourth example show older people being the object for new IT-systems. In a study conducted between 1992 and 1994, the first home shopping terminals to support elderly people in Sweden were evaluated with twenty older users, 80–102 years old, living at home and dependent on the public home help service for daily shopping of groceries. The purpose was to examine to what extent such a home shopping system could replace store shopping and how it intervened with the users' relations with the home help service. The adventure was initiated by the Municipality of Malmoe, the National Telecommunications Authority – Televerket and Samhall, a state-owned Swedish company assigned to provide meaningful work for people with disabilities. More than 800 home shopping terminals were tested among elderly persons dependent on help with the shopping of daily groceries. The purpose was that they should do the shopping from home, on their own or together with their personal caregiver from the home help service. In doing this, the caregiver was supposed to free up time which could be spent together with the care receiver. At the same time, the municipality would save money. The time spent and the costs saved were calculated in detail. To pick up the groceries at the store and delivering them to the homes was done by people employed at Samhall. On the first page of the main regional newspaper, there was a picture of four men representing actors involved in this venture assured that "*this is the future home helper for elderly people. The home help service is first out using computer shopping*". They proudly announced that the home help service were the first at launching "computer shopping" and thus were supposed to get a first glimpse into the future. Like the Bangemann report, this venture identified the needs of elderly people as a perfect fit into IT-development [3].

The result of this venture was described in a dissertation where the importance of technology in everyday life was studied from the perspective of older people (Östlund 1995). Very few terminals were actually used by the elderly or by their care givers. The resistance among the elderly people was misinterpreted, the efficiency of the relationship between the home help service and the elderly care receivers was

misunderstood and the time needed to make the system work miscalculated. The majority of the elderly that were provided with home shopping terminals did not make use of them; neither did the home help services because of a range of technical failures. Being active users in charge of their own lives and with a lifelong experience of technological change they didn't find that the home shopping terminals had any comparative advantage to the existing shopping practice. Consequently, increased usability, meaning a more usable and appropriate interface would not change the situation.

The venture ended after two years trials. It was overthrown by another solution procured by the municipality: a car delivering groceries once or twice a week, picking up shopping lists and assisting the elderly with carrying in the packages. If this example will constitute a step towards home shopping on the Internet as we know it today, will show in a later historical perspective. Nevertheless, it is an example of a technically driven venture, typical of the early days of IT development. Elderly people were discovered as a potential target group, or at least as fictive users with, what seems to be, needs that met the technical possibilities of that time.

4   Conclusions

The projects above illustrate different degrees of user participation and demonstrate the importance of choosing appropriate methods for what you want to achieve. Obviously, older participants can contribute to design in various ways. The complete citizen participation on the upper steps of the ladder brings more options to sustainable changes compared to the lower steps, of which the designer is more in control. The advantages of involving older users are first, that they have lifelong experience of technology use. Second, their experiences include a wide range of technological changes and technological development. Hence, they are familiar with changes. Third, the effect of aging makes them more pragmatic compared to when they were younger. This is a consequence of that they now have to economize their time and energy. They are willing to learn to use new technology if it is worthwhile but not because it is new. This experience, combined with the ability to see the big picture is nearly unbeatable.

Some learning lessons from innovation research prove that life experienced people fit very well into what is needed for successful innovation processes. In this paper, the examples reflect both innovation processes i.e. driving changes where defining what kind of IT will be the best support is a part of the project as in the first example, and design processes where the technological support is already defined but needs to be designed as in the second and third examples.

Readings of Porter and von Hippel prove that some of their findings and theories should be worthwhile applying in this field, trying out the benefits of involving old people in design [18, 19, 29]. The readings of these authors make me draw the conclusion that the following factors are among those contributing to successful innovation processes: high demands and difficult problems that offer resistance but include users that are patient and experienced. Old people meet these demands since they are experienced, pragmatic, patient and trustworthy. The latter can of course change over time if values in society change. On the other hand, dependency and independency

probably effect the relationship to project leaders as well as to care givers. The benefit of involving older users is, in terms of innovations, especially important when it comes to their participation on the higher steps of the ladder. They are not, as has been often referred to, laggards, they are also early adopters if they get the chance [30].

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