

# Participatory Design and the Divide between Developers and Older Adults

How the Division of End-Users and Tech Developers During Participatory Design Processes Leads to a Decrease in Decision-making Power of End-Users in the Development of Socially Responsible Technology

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## ABSTRACT

With the demographic change and the digital transformation as two major trends in today's Western societies, new technologies aimed at older adults emerge at a fast pace. To meet the needs of older adults in technology development, participatory design in the form of living labs is practiced with an increasing number. Nonetheless, studies suggest that there are still ageist assumptions and stigmatizations persisting within the field of participatory design. Based on this, we examine two examples of living lab testing regarding the division of end-users and tech developers, as well as their respective decision-making powers in the development of socially responsible technology.

## CCS CONCEPTS

• Human-centered computing → Human-computer interaction (HCI); HCI design and evaluation methods; Usability Testing; • → Applied Computing; Law, Social, and Behavioral Sciences; Sociology

## KEYWORDS

Participatory Design, Gerontechnology, Aging, Ageism

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## 1 Demographic Change and Digital Transformation

The demographic change and digital transformation are two major trends in today's Western societies. The proportion of people aged 65 and older is steadily increasing in all industrialized countries, due to an increase in life expectancy as well as a decline in birth-rate [Vaupel 2000; Peine et al. 2014]. Living in their own homes independently is preferred by many older adults, while they also need to feel safe and socially connected [Hedtke-Becker et al. 2012; Marek & Rantz 2000]. In order to meet the needs of this growing population, new technologies emerge at a fast pace [Phillips 2011].

## 2 Ageism in Participatory Design Processes

However, technological innovations are often driven by technological feasibility and not by the needs of its end-users - in our case older adults. To overcome usability barriers, emotional barriers, and to ascertain full acceptance of technologies designed for older adults, it is essential to understand their actual needs and to include them as active agents into the process of innovation and development of technologies.

Even though Participatory Design (PD) is often presented as the solution to these issues, research suggests that current PD practices are still overly paternalistic. This and ageism as well as stigmatization of older adults during co-creation processes in PD are impeding with the success of PD processes in technology development for older adults [Peine 2019; Compagna & Kohlbacher 2015; Johnson 2005; Vines et al. 2015]. We propose the hypothesis that a division between tech developers and end-users in PD processes that use mediators, leads to a decrease in decision-making power of end-users in the development of socially responsible technology. We base this hypothesis on observations of two research projects, that focus on the further development of technologies within our Living Lab structure.

### 3 Living Labs

As a countermodel to artificial lab environments, we test innovations in so-called living labs. We use a living lab approach, where technical innovations are tested in the real, domestic, everyday environment of end-users [Folstad 2008; Franz 2014; Hämmerle et al. 2018]. Here, the end-user takes on a role as central evaluator, being a key-factor in the PD process. Due to the participatory involvement, end-users can provide direct feedback early on, while products and services can be tested and have the chance to be improved in an iterative process. Our interdisciplinary team, inter alia consisting of sociologists, gerontologists, social workers, ethnologists, and psychologists, take on the role as mediators at the interface between end-users and technology developers.

### 4 Living Lab Testing: Two Examples

*Project A* aimed at developing a smart upper-arm sensor for older adults to independently measure vital data. *Project B* focused on the development of a smartphone app to facilitate usage of smartphones for older adults. We selected these projects due to their almost identical starting point and study design. Both were third-party funded projects in collaboration with technology developers, where our project partners provided the technology, and we conducted the respective living lab tests. When living lab testing started, both products had already reached the middle stages of the development process. Both projects included long-term living lab testing with similar approaches of data collection: Qualitative interviews and quantitative surveys before and after living lab testing, as well as complementary test diaries led by the project's respective test participants. We had two major differences in the study designs of both projects. *Project A* included an additional, preliminary co-creation workshop with older adults, whereas in *Project B* the developer of the smartphone app observed one of the qualitative interviews. During this qualitative interview, the developer had the chance to get into direct contact with the study participant. Within both projects, the developers had final decision-making power.

### 5 Observations

During the duration of the projects, we were able to observe two different patterns. At the beginning, both project partners appeared to be reluctant to include specific user feedback into their development processes. For instance, even though *Project A* had an additional co-creation workshop, we noticed that there were no visible or evident alterations between the device from the workshop and the ones later provided for living lab testing. A similar reluctance was observed in communication with *Project B*'s developer. At every round of feedback, the developer provided explanations why the given feedback was invalid or irrelevant.

While the pattern of not taking end-users' feedback into account persisted within *Project A*, testing had to be paused due to undue burden on our study participants. The same observed pattern in *Project B* started to dissolve once the developer joined a qualitative interview. Instead, the initiation of constructive bargaining processes with an active attempt to find solutions

based on the study participants' feedback became apparent [Compagna & Kohlbacher 2015].

### 6 Conclusions

Even though end-users were not directly able to influence the development of the products, they were nonetheless able to have an indirect impact on the development through their feedback. This indirect impact on the other hand was completely navigated by the respective developers, since within both projects, the developers had final decision-making power. This negatively affected the degree of influence end-users were able to take on the final products and lead to a power imbalance between developers and end-users within the design process.

Based on our observations, with little to no change in implementing user feedback during *Project A*, where a divide between developers and end-users was apparent, and with sudden shift toward actively including user feedback in *Project B* after joining one qualitative interview, we assume that a division of end-users and tech developers during participatory design processes may lead to a decrease in decision-making power of end-users in the development of socially responsible technology.

We therefore suggest an in-depth, targeted analysis of the divide between developers and end-users in participatory design processes to deepen the knowledge in this field. This will help further improve participatory design in socially responsible technology development.

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