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# Technical and Affective Practices. An Investigation of Service Robots in Nursing Environments

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**Abstract.** This overview explains the first steps of a participatory design project. The aim is to evaluate a service robot for nursing with a qualitative approach and to explore technical and affective practices. The data will be analyzed with practice theory related to the grounded design paradigm. Expert interviews with five care workers and five IT specialists in the field of robotics will be conducted during 2020. Afterwards a series of participatory workshops with participants in need will be carried out focusing on the practices related to robots in caring settings.

## Introduction

Changes in population structure create new problems and challenges for care work (Sparrow, 2015). The increase in older people with dependencies and the decrease in trained care workers is leading to a search for alternatives worldwide. But in the meanwhile, various models of service robots have come on the market.

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They appear to be a way to support mechanical care work and give care workers more time for meaningful, emotional activities (Whitby, 2012).

The research question is *How are technical and affective care practices interconnected in the design process of service robots?* The research deals with the issue of when practice is experienced as technical or robot-like and when practice is understood as affective or human-like. Both practices are present in the care profession (Graf & Treusch, 2020). For example, elderly residents in nursing homes experience some of the tasks of care workers as technical because they are mechanically or routinely carried out. A robot can serve as a replacement with respect to these tasks. On the other hand, care workers also engage in affective practices that require emotion, compassion and empathy. Can a robot do that too? What is of interest here is how these practices are experienced and how this experience of technical and affective practices influences the design, assessment and appropriation of robots. Are there certain practices that have to be executed mechanically for them to be considered good care work? Are there activities that have to include emotion such that they can be understood as solicitude?

To clarify these questions, the grounded design framework is chosen (Müller, 2019). Ten interviews with experts and several focus groups with participants in need of care will be conducted and qualitatively interpreted. The different experiences of practices will be identified in this context and the practical implications for the robot design process will be explored.

## Methodological approach

Participatory design is the methodological departure of this overview (Müller, 2019). The focus is on designing, assessing and appropriating a product together with its potential users such as people in need of care and social workers and on understanding the product development as an iterative, mutual process. Potential users are not just questioned with a view to a one-time acquisition of knowledge. Instead, the focus is on a reciprocal teaching and learning process where knowledge is generated through mutual exchange. It allows people in need and care workers to not just remain in the role of the user, but to act as active participants.

Practice theory provides the descriptive paradigm for the interpretation of the data (Reckwitz, 2002). This theory is particularly suitable for the analysis of participatory design and robotics. The emphasis is on the social situation and the emergence of mutually connected practices. Several relevant stakeholders are involved in care practice: The care workers, the nursing home staff, the robot developers, the researchers and even the robots. We can determine which practices are to be carried out and which habits the actors will follow by considering the entire constellation of actors.

I will not be developing an actual new product but try to understand the emerging practices in relation to an existing robot. Therefore, the focus is on an

inductive and deductive interpretation of the data and a constant refining of the data collection, interpretation and presentation of the results. However, the work does not follow the approach of Grounded Theory in all respects, but rather adapts it to practice theory. Different types of practices will be identified in the data (Strauss & Corbin, 1990).

## Next steps

Since the work is at its initial stages, research findings will not be presented here. The project is primarily concerned with reflecting on the existing state of research (literature review) and focusing on the research question *How are technical and affective care practices interconnected in the design process of service robots?* Accordingly, it refers to participatory design studies.

The emphasis here is on the design, assessment and appropriation of robotics in care environments from a practice-theoretical perspective (Reckwitz, 2002). After working on the literature review and placing the work in the existing research discourse, I will explain the practice theory and grounded design as methodology. I will then qualitatively analyze expert interviews and focus groups (Müller, 2019).

For the initial analysis, expert interviews with five care workers and five IT specialists will be conducted in order to learn which practices are used in care work and how a robot can be integrated into the nursing process. These experts will also serve as advisors who accompany and comment on the research process. In addition, focus groups with residents of nursing homes will be formed. Workshops will be repeatedly conducted with regard to the various design steps of the robot. These results are conveyed to the workshop participants and integrated into the design process of the robot. The robot will be appropriated in an iterative way, similar to the methodological evaluation of the material.

## Expected contributions

The focus of this research is on the participation of the residents of nursing homes, their relatives, care workers and developers of robots in the design process. The aim is to reveal which requirements can be expected to be fulfilled and how a robot can be appropriated through participatory design. This means that it is not just the usability of an already existing robot that is tested. Instead, a robot is examined in a collaborative design process and its various facets are worked out in this context.

This procedure creates a research process that directly integrates future users and their expectations. This thus makes direct reflection on the expectations present in this process possible. Additionally, it can show how different practices are experienced and how affective and technical practices can be distinguished.

## Open questions

An open question concerns the extent to which a service robot will be accepted in its different appropriation stages and in general what value acceptance plays in participatory design research. Acceptance is a phenomenon that is usually assumed during development (Hagen et al., 2018). Issues that needed to be examined are which user groups are invited, how heterogeneity is ensured and the extent to which these groups are representative of the profession or care environment. For example, are those who the volunteer only persons who are already in favor of robots?

Due to the 2019-20 coronavirus pandemic, it is also unclear, if ethnographic fieldwork can also be conducted so as to observe how a robot could be used in practice. That could give insights as to how a robot is integrated into the everyday life of a nursing home.

Finally, the gender perspective can be considered, for example observable gender differences in interacting with a robot and the gender stereotypes that could be implicit in the manufacturing of a robot (Haraway, 2004). Another open question here is how to address and conceptualize the dimension of gender in workshops and in the appropriation of robots.

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