

# Financial and Work Process related Perspectives of Social Robots in Care Settings

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**Abstract.** Research on social robots in care environments is happening since decades, yet the robots are rarely seen in care homes, despite the increasing pressure on the sector. With this submission we want to show financial and work process related perspectives of robotic systems in care environments. Our findings originate from 66 interviews with stakeholders from the care sector. We present and discuss dimensions of help for care workers through robotic systems with the according visions of stakeholders and financial aspects of the robot usage.

**Keywords:** Social Robots · Care Robots · Stakeholder Analysis · CSCW · HRI · Social Assistive Robots · Care · E-Business · E-Health · Health Insurance

## 1 Introduction

Research on social robots in care settings has a long tradition and has produced numerous results that indicate that the technology is, to some degree, ready to be used in care homes [5,7,13,11]. However, and despite the constant pressure on the care sector, the technology is not widely used. There are numerous explanations why this is the case, ranging from software and hardware limitations to legal, ethical, and organizational reasons [12,14]. One perspective that we want to present is the financial and work process related one, social robots are expensive machines and care workers are not trained to use them. The usage is not foreseen in the training of care workers and is somehow exotic to all involved stakeholders. For the social robots these two things are essential, as long that it remains unclear on how robots can be financed, they will rarely be seen in care homes. The same

applies for the care workers, if they are not trained to use such technology the robot is likely to be not used once it arrives to the care home.

## 2 Methods

The data shown in this paper is based on interviews with 66 stakeholders from the care sector. These were carried out in 2018 and took place at events and fairs that are related to the care sector. For the interviews the participants were shown the robot Pepper and its software which was specifically designed for care homes. All participants are related to the care sector and have professional or personal affiliation to it. Interviews typically lasted for 20-30 minutes. The data was analyzed using the reflexive thematic analysis by Braun and Clarke [1]. We transcribed the interviews, pseudonymized them, build inductively categories to systemize the content. To pseudonymize the participants we gave them names that contain of one letter and a number (e.g. P1; P12). Behind the name we wrote the function the people were representing during the interview. This paper solely focuses on what the interviewee have said about economic and work process relevant content.

## 3 Results on Financial Aspects

When asked about Economic aspects, the interviewee predominantly gave answers in relation to the current job conditions in the care working sector. They described unattractive working and salary conditions in care working. One hope is that the conditions will become more attractive by robotics, as relief and relaxation might come from that development. P31 (Care Worker) states in this regard: *“[...] as long as our government does not do anything to make the profession more attractive, in the form of money, in the form of recognition and in the form of social promotion. As long as our profession is so unattractive, with shifts, with all the trimmings, and then also so poorly paid, there will be no relaxation”*. P9 (Marketing, Care Sector) has a similar opinion: *“I mean, we hear it everywhere. Fewer and fewer people are going into care working, the profession itself is not attractive, and that maybe it's just through this interaction that you make the profession more attractive”*.

Both point out that the work of geriatric nurses and care worker is physically and mentally demanding and at the same time poorly paid. They hope that robots will be able to remedy this situation and, above all, take over heavy physical tasks (lifting, etc.) so that the care worker themselves can focus on human care. The relief this would bring could make the profession more attractive again and thus counteract the shortage of skilled workers.

One care worker who commented on the economic aspects had a different focus and considered whether robotics in the care sector is at all financeable and thus feasible for people living at home:

*“I don't know [...] how it is with the financing. Whether it's even possible to get something like that. Sometime in 10 to 15 years the costs for such technology might be covered. Otherwise, it will be difficult that people would buy something like that [...].”* P41 (Care Worker).

P46 (Quality Manager, Care Sector) has similar concerns but sees at the same time potential to reduce loneliness: *“now that I have heard the costs [20.000€ + Software Costs of around 1000€ per month], I think it would probably not easily be possible. But I like the robot, if one offers that somehow at least to people who are alone at home. So that you could say, once it is cheaper, okay at least there's that now [to reduce loneliness]”*.

For both interviewees, it is hard to imagine that every person in need of care or the care facility could afford the appropriate robotics, even if the use was wanted. P41 raises the question whether the use of robotics could be subsidized, since otherwise the financing seems hardly possible. And P46 also emphasizes that it would be easier if the costs were lower.

## 4 Results on Work Processes

On the topic of work organization, the interviewees agreed that the usage of social assistive robots in care should primarily mean a relief and facilitation of everyday care work for the employees and specialist care worker. P1 (Retiree) says: "On the one hand, of course, it's a tremendous relief." P4 (Retiree) and P3 (Retiree) also specifically name documentation as a point where robots could facilitate work processes: *“[...] For all the documentation. If there was a possibility based on tape recordings that it [...] programs information and then presents it in writing”*.

The overall hope is that the use of robots can help care worker to spend more time with individual patients in their daily professional lives and thus also to engage and interact more deeply with individuals. P11 (Account Manager, Care Sector) puts it this way:

*“I hope [...] that care worker can focus more on the actual tasks that they have. To deal with the people, to take care of them and not with administration or technical things of any kind. [...] It's not just about robots in the elderly care facility, there are many things that are simply done by care working staff that are not actually part of their tasks. These could be automated. [...] Then the care working staff would be much better ... or have more time for their actual tasks.”*

Robotics is generally seen as a supplement to the nursing work of care worker, which can help to relax the daily work routine and thus the -processes.

*“[...] I find, by the fact that human work, that is human to human, is not replaced. I think it can be a complement. The technology can be fun, the technology can maybe also facilitate, maybe also take work away, but then hope that there is more time for human work”.* P12 (Care Employment Agency).

P15 (NGO) remarks similarly: *“That you then go more into individual care and the physically difficult activities, for example, or the domestic support just about robots.”*

## 5 Discussion & Conclusion

### 5.1 Dimensions of Work Relief

It becomes apparent, that most interviewee saw a need of relieving the work pressure of care workers. Many saw the social robot as a tool that should work on tasks that are interpreted as redundant, physically demanding or boring and not essential for the wellbeing for people in need of care. The social interaction is seen as the one task that should become a higher priority, while others should be automated and done by a robotic system. We identify three different dimensions of work relief, that was named by the interviewee:

- (1) Reduce work pressure, through social interaction with robot
- (2) Robot does non-social care work and leaves care worker time to have social
- (3) Robot does non-social care work and relieves work pressure in general

The presented robotic system is a social assistive robot and the software that was shown is mainly working to entertain and activate people in need of care. It therefore only is applicable for the first dimension. It seems that while the robotic system is generally seen as useful it is also a projection of the interviewee to name what goes wrong in the care system and what should be changed for good care that is satisfying for residents and care workers alike. The robot is used as an object to articulate the needs of the field. This kind of projection could already be observed with robot researchers and seems to be something immanent, when working with social robots [6].

### 5.2 Financial Aspects

Financial reasoning seems crucial for social assistive robots in care homes as overall cost are raising, budgets stay tight and at the same time, due to the democratic change, the workforce needs to grow. As of today, the work conditions of care workers are not good, fewer people decide to work in this sector and people who already work the job, decide to leave it early on [9,10], while at the same time the number of people in need of care are growing. The interviewee named four problems, (1) people working in care deserve more money for the

demanding job and responsibilities they have. (2) The recognition of the job is low within the society; care work is seen as something important but not as something attractive. (3) Shifts can be demanding, care workers are working many hours and often must cover shifts for other, as many care homes are understaffed. (4) Social robot solutions seem to be too costly for the task they can fulfill.

The interviewee thought that through the automation of care work by robots the workers would then have more time for the social interaction with residents (even though the presented robotic system was not able to automate care work tasks). This would then change the job criteria, potentially making it more attractive, as redundant and physically demanding task would represent a smaller part and social interaction a bigger part as of today.

This scenario is under several preconditions, it would mean that the technology reaches a point where it becomes a relief of work, a relief of unpleasant work [2], this is not where the technology is today, social assistive robots are more in the domain of social interaction with residents, covering the parts that is seen as attractive. The robots can increase quality of care, if developed with participatory methods [5,14], but does not have a time relieving effect yet [3,8]. Further it would mean that the funding of the robots is taken from another source as the funding of care workers, as robotic systems are likely to be costly and therefore reduce the ability to hire new people (or even to pay care workers more). If additional funding is granted it would become possible to overall increase the quality of care, but this would also mean that the government and the people in need of care have to dedicate a bigger portion of their budget towards care.

In summary, the tension between financial challenges and a possible reduction in workload as well as an increase in the quality of care is very extensive and thus raises complex fundamental questions.

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