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From Co-design to Industry: investigating both ends of the scale of developing Social Robots

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Introduction

This paper merges two separate work packages – Co-design as a genuine bottom-up approach and industry-based perspectives on the development and future of social robotics. The first work package is mainly informed from undertaking a literature review of the premiere outlet for Co-design – the Participatory Design Conference series (bi-annual since 1990), where the focus was on Elderly and Social Robots. That particular work package is published in the [COST] state-of-the-art report as well as underpinned by own publications and research from a Danish neuro-centre context of co-designing social robots (Rodil, Rehm and Krummheuer, 2018).

The other, industrial, view has been informed by a Short Term Scientific Mission granted under the Shield-on COST Action (16226) allowing a trip to visit Dr Isaacson at Faculty of Social Welfare & Health Sciences Department of Gerontology, Haifa University in Israel and a series of companies pertaining to development of social robots (and more broadly) for the ageing population. The STSM objectives (STSM, 2018).

The concept of Social Robots on a scale

Social Robots, defined according to the International Journal of Social Robotics, as "Social Robotics is the study of robots that can interact and communicate between themselves, with humans, and with the environment, within the social and cultural structure attached to its role." (IJSR, 2018)

There are many definitions like the one above and they all share the inability to accurately address, what makes a robot a social robot? In times that are very positive towards the multitude of challenges which can be remedied by artificial intelligence, robots etc. it became a somewhat strange experience to keep reading about the promised land of these social robots – both in academic outlets and in mass news outlets. As the definition (above) fails in capturing the most basic nature of social robots, we decided to investigate the concept and its plausible relation to the ageing population. We formulated an initial research question based on the assumption that the ageing population, due to shrinking personal networks and (in many cases) are less digitally literate than younger generations, must be primary adopters of sociality enabling autonomous creatures – social robots.

The idea of a scale came from considering how underlying technology development processes might or might not be the reason why there is little fruitful construction and uptake of technology. On one end we positioned perhaps the most academic and bottom-up process (Participatory Design/Co-design) and on the other end user-centred companies employing novel technologies available – some of the companies where the expectations to see them succeed are highest. The question was, are any of those two ends representing technology, which has enabled the ageing population to be more social with the use of robots?

Findings

The investigation began by surveying 433 papers from the Participatory Design Conference series as Participatory Design (PD) represents a design methodology very much arguing for the inclusion of future users in design processes as a way to handle the technical barriers, make the systems more relevant on a small scale (contextual and situational) – all to ease adoption.

The first time robots are mentioned directly in the literature is in the proceedings of the PDC in 2002. In conclusion, the field of PD (limited by the PDC proceedings and search strategy) does not provide any technical endeavours cracking the code of making robots social for the ageing population. Robot solutions are primarily limited to ideation (very early project phases), and very little tangible robotic development is published. While the field of PD has fallen short in providing a way into a promising social robotic future, we decided to look at the other end – the industrial one. This industrial end shows optimism in the number of millions of dollars invested and where there is a liberal, almost deterministic view on technology.

It should be mentioned that the company visits in Israel were located at some of the companies which the rest of the world expects a lot from.

To summarise the insights gained during the STSM.

The visited companies in Israel are:

- (1) Not designing and developing with a participatory agenda. In general, the companies' approach can best be classified as user-centred.
- (2) Having significant challenges in identifying who will pay for their products. Products are too expensive for the ageing population (B to C) and not attractive enough for institutions (B to B).
- (3) Not yet able to entirely create functioning social robots and they are not social

The conclusion is, there are not yet social robots for the ageing population to adopt, nor are these systems just around the corner. Technologically they are not advanced enough or affordable, but most importantly, they do not seem to capture the essence of being social.

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