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The Business of Supporting older People with Care Robotics: A German-Japanese Comparison

介護用ロボットの高齢者支援事業の日独比較

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Abstract: The major problems related to the demographic shift are similar in Japan and in Germany. Both countries are taking into account various strategies to face them. One big challenge lies in the appropriate development of service robots. A comparing view of the differences and similarities regarding the development trajectories could be of benefit for both countries, e.g. service robotic communities. The aim of our paper is to show and discuss the efforts to develop service robots for the care sector in both countries and to identify criteria of how to improve the developments by comparing the different orientations and methods of developments.

Key Words: Participatory Methods of Development, Care Robotics, Demographic Shift, Service Robots, Care Facilities

Summary

1. Introduction

Aging and shrinking populations can today be seen in almost all industrial nations, and are understood as one of the most challenging global trends (Bloom 2011). Globally, the number of persons aged 60 or over is expected almost to triple, increasing from 737 million in 2009 to 2 billion by 2050. In developed countries as a whole, the number of older persons has already surpassed the number of children (persons under age 15), and by 2050 the number of older persons will be more than twice the number of children. But this trend also affects countries of the developing world. In developing countries as a whole, even though just 8% of the population is today aged 60 years or over, this share will more than double by 2050, reaching 20% that year. This structural change will have strong effects on the society, the economy, and individual people (e.g. Kohlbacher & Herstatt 2011). One particularly crucial issue in this context is elderly care and the support of both older patients and care givers. Technology – and in particular – robotics have early on been cited as promising remedies (e.g. Dario et al. 1999).

2. Care Robotics in Germany and Japan

Attractive lead markets can be found in countries in which an innovation is first widely adopted and accepted, and eventually also diffuses from there to other countries (Beise 2001, 2004). Among other factors, demand and demand structure are important drivers in the development of lead markets. Mega-trends like demographic change cause new demand or shifts in existing demand, and can, thus, create and influence lead markets and their business potential in the countries in question (see also Kohlbacher et al. 2011). Given that Japan is the country most severely affected by the current demographic shift, and also one of the most advanced countries in terms of product development and innovation (e.g. Herstatt et al. 2006), Japan can be expected to have a high potential as a lead market for technologies for the aging society. However, surprisingly and despite the fact that Japanese care robotics have frequently been featured in the media around the world and cited as important innovations by experts, this industry does not seem to

have come up to these expectations (Kohlbacher 2011). Indeed, many technologies are still under development, or if already launched into the market, are not performing well or have already been withdrawn again. There are several reasons for this, including cost, regulation, and safety issues, but there also seems to be a mismatch between what users really need and what is actually developed (Kohlbacher 2011).

Germany is following suite in terms of the demographic shift and technology development and thus also has a lead market potential. Due to the demographic shift the development of Service Robots that could be introduced in care-settings also are becoming more and more important (Compagna et al. 2011; Geiger 2009). In Germany the development and production of industrial robots already reached a worldwide leading position; the goal of the German efforts is to achieve a similar positioning the field of service and care robots. The main strategy to achieve this goal is in Germany to improve methods of user-centered developments and the same time to keep track on designing high reliable robots. Although the balance point of further developments of Social Robots e.g. Service Robots still lies upon the functionality of these systems, the baseline assumption for choosing this strategy is that functionality among the aimed care-scenarios depends mainly on the successful interaction between humans and robots. For this reason a main research area is designing the interface (Giesecke 2003). At the same time, especially for this field, the interaction between the artefacts and the humans is a big challenge: First, care work is in Germany a strictly human-related area, every introduction of machines must be done very carefully, due to many prejudices (Fischer 2010). Second, the target group is not very technique affine (Jakobs et al. 2008). These aspects, combined with expectations that the care sector grow into a very important field for the further development of Service Robots, are leading to increased efforts to include the user in the development process (Winance 2010). In the end the successful development of Service Robots depends significantly on the well-balanced reconciliements of the technically possible and the socially desirable.

3. Conclusion and Outlook

Our goal consist in identify parallel ties as well as differences between the developments within the field of service – and specifically care – robotics that could be a benefit for both the Japanese and the German future R&D efforts. In particular, we are also interested in problems and issues that need to be overcome in both countries to develop successful solutions in the care robotics field.

One fruitful contribution could be seen in the user orientated development methods in Germany from which the Japanese R&D could benefit. At the same time, huge efforts of the Japanese developments of humanoid robots could be of benefit to the German development efforts which are focusing mostly on mere functionality without taking the benefits of a more humanoid appearance of the robots into account. These are just 2 examples, but there exist many more opportunities. Indeed, we argue that both countries can learn from each other and their different approaches.

Last but not least, the institutional environment also needs to be favorable in terms of government support, flexible regulations and insurance coverage etc.

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