

Final Report

[ORIENT]

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1 General Information

1.1 Acronym of the collaborative project

ORIENT

1.2 Full title of the project

Use of care robots in welfare services: New models for effective orientation

1.3 Project duration

Planned start date	1 November 2017
Actual start date (of earliest starting national partner)	1 April 2018
Planned end date	31 October 2019
Actual end date (of latest ending national partner)	31 March 2020

1.4 Project coordinator

Name	Helinä Melkas
Institution	Lappeenranta-Lahti University of Technology LUT
Country	Finland
Email	helina.melkas@lut.fi
Funding Organisation	Academy of Finland
Duration project participation	1 April 2018 – 31 March 2020

1.5 Project Partners

Partner 2

Name of Principal Investigator	Christine Gustafsson
Institution	Mälardalen University
Country	Sweden
Email	christine.gustafsson@mdh.se
Funding Organisation	Swedish Research Council for Health, Working Life and Welfare (FORTE)
Duration project participation	1 April 2018 – 31 March 2020

Partner 3

Name of Principal Investigator	Kirsten Thommes
Institution	Paderborn University
Country	Germany
Email	kirsten.thommes@uni-paderborn.de
Funding Organisation	Federal Ministry of Education and Research
Duration project participation	1 April 2018 – 31 March 2020 (Cost-neutral extension until 31 August 2020)

Please insert further tables to add more partners, as appropriate.

1.6 Project budget

Please add the budget of the overall project (total budget) and the budget per partner in Euros.

	Funds awarded	Actual spend
Total Budget	€674 442	€639 072

	Funds awarded	Actual spend
Budget Partner 1	€246 715	€246 715
Budget Partner 2	€200 605	€181 684

Budget Partner 3	€ 227 122	€ 210 673
Budget Partner 4	€	€
Budget Partner 5	€	€

Please insert further rows of the table to add more partners, as appropriate.

2 Plain English Abstract

Please briefly summarise the project including its achievements and main conclusions in plain English (see <http://www.plainenglish.co.uk/free-guides.html>). This abstract will be made publicly available, including being published on the JPI MYBL website (max. 500 words).

The ORIENT project focused on orientation to use of care robots in welfare services for older people using a co-creative approach. We perceive care robot orientation as the *continuous co-creative process of introduction to technology use and its familiarisation, involving the learning of multi-faceted knowledge and skills for effective use*. We produced novel knowledge on this topic and identified and developed innovative methods and models for care robot orientation. The work and dissemination of results were boosted by active interaction between ORIENT and the people utilising the results.

ORIENT produced new knowledge on how robots should be introduced; how to plan their use; what kind of support and information the various stakeholders need (older customers, relatives, caregivers, service organisations and other stakeholders) – and how all these can be taken care of in daily services. One of the central contributions was mapping the four aspects of orientation; “why”, “what”, “who/whom” and “how”, which should be considered in care robot orientation at any level of society. Our work in ORIENT also aimed at smoothening the co-evolution of care robot technology and service innovations.

ORIENT contributed to overcoming pitfalls in care robot use for older people’s wellbeing; to user-friendly and effective use of care robots, and to benefiting from new opportunities provided by care robots. The interview data (more than 130 interviews), combined with the data from a survey as well as an experiment and co-creation workshops, provided a multi-faceted and multi-level picture of the situation of care robot use and orientation in Finland, Sweden and Germany. Care robot orientation needs to address different levels and groups in the society, in various appropriate, tailored ways.

ORIENT resulted in both scientific and practical outcomes; scientific articles in high-level journals and books of high-quality publishers and more practice-oriented publications (care robot orientation guides and animations in four languages). Our results showed the need for increasingly context-related, user-oriented orientation methods related to care robots – for older people, professional caregivers and other stakeholders – also at the societal level. Through better care robot orientation, the use of robots may be more understandable and meaningful, and the digital exclusion of older people may decrease. ORIENT also promoted provision of information in an understandable and meaningful way.

Apart from the importance of care robot orientation in general, ORIENT increased understanding about its different aspects in the introduction and implementation of care robots. On the basis of our results, many types of knowledge are needed, and awareness should be improved concerning the necessary resources for proper orientation for the professional caregivers to work with robots. Our research suggests that care robot orientation can be linked to the framework of sociotechnical transition where the roles of technology as part of care work and services should be understood better. Novel knowledge was produced also about the use of care robots as a broad-based, systemic issue requiring collaboration between different policies and sectors. ORIENT was implemented in 2018–2020 by Lappeenranta-Lahti University of Technology LUT, Finland; Mälardalen University, Sweden, and Paderborn University, Germany.

3 Achievements

Please describe the achievements of the overall project in relation to the aim of the joint call. There is space to elaborate on the achievements of individual work packages separately in the next section. The aim of the joint call was to support research concerned with the ways in which the health and wellbeing of older people, at all stages of later life, is supported and promoted through the design of the social and physical environment, access to opportunities to learn, and the use of technologies of all kinds. Each project addresses the topic of technology (I), projects may also address topics of place (II) and learning (III) in relation with technology. The interaction between technology, place and learning is important to the health of older people, and research which explores them may produce important new findings to inform policy.

- I. **Technology:** especially digital technologies, are constantly evolving, and these changes have an important impact on the quality of individuals' lives, on their engagement with others, and on their participation in wider society. We need to understand how existing and emerging technologies can improve the quality of life, contribution and social engagement of older people.
- II. **Place:** refers to how individuals experience the places where they live, work and engage with others, and how learning and technology enhance or diminish their quality of life. While it is well studied what kinds of housing, transport and urban planning are most effective at enabling people to remain independent and socially engaged throughout the lifespan, we need to understand policies and ways to achieve desired changes
- III. **Learning:** in all its forms, is critical to people's ability to make the best use of the opportunities available to them, as to avoid cognitive decline. While it is clear that learning can contribute to quality of life across the extended lifespan, we need to better understand how opportunities for such learning can best be made available, by public, private and third sector means. It is important to find examples of, and develop policies for, increased access to learning and competence development across age.

Please explain how the project results contribute to these research topics (if applicable).

Technology
<p>ORIENT's work and results contribute directly to this research topic. Technology was at the core of the project through its focus on care robots. Care robots are a good example of digital technologies that are constantly evolving. Their use is still not prevalent in the three countries (or elsewhere). The use of care robots can potentially have an important impact on the quality of individuals' lives, on their engagement with others and on their participation in wider society. Realisation of this potential depends, however, on several issues; the individuals' life circumstances, services, service systems and maturity of technology, inter alia. In addition, 'place' and 'learning' are intertwined with all these issues. ORIENT's results contributed to better understanding concerning the preconditions of care robots improving older people's life, contribution and social engagement. The results also provided practical information concerning how to deal with current and future shortcomings and thus informed policy.</p>

Place in relation with technology
<p>ORIENT's work and results are also related to "Place" through impacts of technology and learning on older people's lives. Technology may have major impacts on places where individuals live, work and engage with others. Those impacts may be positive, negative or neutral, and related to various factors, such as quality of life including independence and social engagement. On the other hand, places may have major impacts on opportunities to use technology and needs for technical functions. While ORIENT did not directly focus on housing, transport and urban planning, it produced new knowledge for policy development related to older people's lives. In line with increasing robotisation, increasingly systemic understanding is needed in the society, and this has been advanced, for example, with ORIENT's multi-level focus (micro-, meso- and macro-levels). Systemic understanding</p>

is needed for achieving desired changes with care robot use to avoid scenarios, where older people's risk of becoming, for instance, socially isolated would increase instead of decreasing.

Learning in relation with technology

Care robot related learning was at the core of ORIENT. In addition to older people, other groups and societal levels were studied, to also advance prerequisites for older people's technology-related learning in the future. Opportunities for learning about care robots must be provided both for older people and people around them, and, systemically, for the society at large, for the benefit of policy development. Learning is needed for care robot technology use to be effective as part of people's lives and services and systems.

In all, a lack of knowledge is considered to be one of the greatest challenges affecting the acceptance of the use of robots in care, as also confirmed in one of the ORIENT articles (Johansson-Pajala *et al.* 2020). Knowledge- and information-related issues are thus essential. Care robot orientation, understood as the continuous co-creative process of introduction to technology use and its familiarisation, including learning of multi-faceted knowledge and skills for its effective use, essentially requires learning in relation with technology. We understand care robot orientation as the *action of orientating*, not as a one-time activity, but an on-going process, which is somewhat continuous. It is more than (initial) training; it is a process that should be able to 'absorb' critical views and questioning attitudes, too. The word 'orientation' itself does not have a self-evident positive nuance, like acceptance or adoption, but may be considered more neutral (Tuisku *et al.*, forthcoming).

The results of ORIENT thus contribute to the research topic of learning in relation with technology via the concept of care robot orientation. It is also notable that we involved both public, private and third sector representatives in ORIENT.

4 Work Packages

Please complete the tables below which are intended to capture details of the achievements of the individual work packages. There is also space to highlight where you have had to deviate from your original work plans and why. This information will help us in anticipating problems that may be experienced by award holders in future joint calls. This section is for internal use and the information you provide will not be published.

4.1 Summary of Work Packages

WP	Title
WP 1	Management and coordination
WP 2	Orientation at the micro-level
WP 3	Orientation at the meso-level
WP 4	Orientation at the macro-level and combination of the levels
WP 5	Stakeholder engagement and interaction

4.2 Achievements

Achievements WP 1

Please describe the achievements of work package 1 in relation to the initially planned objectives (max. 2 pages).

WP 1 was implemented throughout the project and was led by LUT. Its objectives were to execute efficient coordination and management activities in order to guarantee sound management of financial issues, project management tools, event coordination and reporting to the funders. This WP was a key tool in order to ensure the project's quality and timely delivery of results, and its overall internal coherence.

The tasks listed are management of meetings (steering committee, project group meetings) within the project; compilation and distribution of progress and financial reporting; connecting third party resources into the project, as appropriate; development of internal and external communication with regard to management aspects.

The project groups in each country were relatively small and the international collaboration between the groups was very active, creating a good atmosphere in the consortium. All the members (8 altogether) participated in three of the four face-to-face meetings. The final meeting on 12-13 March 2020 was an exception, because the two German members had to cancel their trip the day before due to the travel restrictions caused by the COVID-19 pandemic, and they participated online, while the other six members met face-to-face. Depending partly on the issues discussed, 6-8 members participated in the monthly Skype meetings. The steering committee discussed issues separately, if necessary (e.g., the consortium agreement related issues), but in general, the communication was kept open across the teams. The financial reporting was done according to national rules to the three national funders separately, so compilation of financial reporting was not done by the coordinator in this type of a project. Progress reporting rules also depended on the country, but joint reporting to JPI MYBL has been coordinated by LUT, with inputs from all the partners. Third party resources included, e.g., a graphical designer who designed the visual look of the project and was involved in the production of the electronic orientation guide as well as the animation. In general, third party resources were related to our communication efforts. Internal and external communication with regard to management aspects was also taken care of, mainly through meetings and e-mail communication. Events of the project took place in all the three countries (face-to-face meetings, a workshop and a seminar) and were coordinated by LUT and the country team in question together.

Achievements WP 2

Please describe the achievements of work package 2 in relation to the initially planned objectives (max. 2 pages).

This WP 2 concentrated on the micro-level and especially the first 12 months of the project. WP 2 was led by Mälardalen University (MDH). LUT and Paderborn University contributed. Its objectives were to characterise orientation practices at the micro-level of customers, care workers and care managers, and develop best practice methods of orientation for this level in the three countries. With the help of this, competences were built up and conditions were developed for effective robot use in care services. The tasks in WP 2 were as follows: characterising various types of orientation observed during the field studies (e.g., technology-centred, marketing-centred, user-experience based, initially); recognising the critical points and potholes in orientation at this level (field data, literature and evaluative interviews); analysis of structures for orientation; exploring methods for orientation, and developing best practices, taking into account the older people's and caregivers' needs.

WP 2 proceeded efficiently. Orientation at the micro-level was focused on by collecting comprehensive interview data in all the three countries. Altogether 71 informants participated in a total of 13 focus groups in the autumn 2018, with 4-7 informants in each group, consisting of older adults living in own housing (24), relatives of care-dependent older adults (16), professional caregivers in assisted living facilities or home care (16), and care service managers in assisting living facilities (15). Four focus group discussions, one with each of the represented groups, were conducted in Finland and in Sweden. In Germany, two focus groups were conducted with older adults, resulting in five focus groups in total.

WP 2 also provided micro-level survey data for the joint article on assistant nurses' views of and needs for care robot orientation in the three European countries. MDH was responsible for conducting the survey data collection in Sweden; LUT in Finland and Paderborn University in Germany. All of the data collection (interviews, surveys, etc.) was planned, prepared and implemented in close cross-WP and cross-country collaboration.

The results of WP 2 were reported in an article published in *International Journal of Social Robotics* and as a paper in conference proceedings and oral presentation at the International Conference on Human Computer Interaction in Florida in July 2019. Another paper – based on another conference paper – was published in an edited volume by De Gruyter. The results were also reported on in an article in German (in *Industrie 4.0 Management*), the project's final seminar in March 2020 and a gerontechnology (ISG) conference in October 2020 as well as to the stakeholders by means of presentations or written summaries.

In addition, WP 2 provided central knowledge for the planning of the co-creation, survey and experiment, as well as the orientation guide and animation that compiled all the results into a compact whole. The orientation guide and the animation were produced in co-creative processes through close cross-country interaction between all the WPs. WP 2 contributed the mapping of “why”, “what”, “who/whom”, and “how” aspects of care robot orientation as the basis and provided knowledge related to micro-level actors and their tasks in care robot orientation.

Achievements WP 3

Please describe the achievements of work package 3 in relation to the initially planned objectives (max. 2 pages).

This WP 3 concentrated on the meso-level and especially months 6-18 of the project. WP 3 was led by LUT. MDH and Paderborn University contributed. Its objectives were to identify stakeholders and sub-levels of the meso-level (e.g., care organisations, municipalities, technology companies, service providers); and develop and test methods of orientation suited to the national characteristics in the three countries. The tasks in WP 3 were as follows: recognising the critical points and potholes in orientation at this level (field data, literature and evaluative interviews); analysis of structures for

orientation, and developing and testing methods for orientation; identification of lessons learned across countries.

WP 3 also proceeded efficiently, by first collecting comprehensive interview data. In each country, 10-12 interviews were conducted between the autumn 2018 and spring 2019. The interviewees (altogether 33) represented companies, interest organizations or associations of social and healthcare professionals, interest organisations or associations of end-users/ citizens (older people), organisers or providers of public social and healthcare services, and educational institutions for educating professionals for social and healthcare or welfare technology fields.

WP 3 also contributed to the survey data collection for the joint article on assistant nurses' views of and needs for care robot orientation in the three European countries. All of the data collection (interviews, surveys, etc.) was planned, prepared and implemented in close cross-WP and cross-country collaboration.

The results of WP 3 were reported on in a journal article published in *Futures*. The results were also reported on in the project's final seminar in March 2020 and a gerontechnology (ISG) conference in October 2020 as well as in presentations to care practitioners and other stakeholders. In addition, just like WP 2, WP 3 provided central knowledge for the planning of the co-creation workshops, survey and experiment, as well as the orientation guide and the animation that compiled all the results into a compact whole. The orientation guide and the animation were produced in co-creative processes through close cross-WP interaction between all the WPs. WP 3 provided knowledge related to meso-level actors and their tasks in care robot orientation. In WP 3, co-creation workshops were organised in May-June 2019.

Achievements WP 4

Please describe the achievements of work package 4 in relation to the initially planned objectives (max. 2 pages).

This WP 4 concentrated on orientation at the macro-level and combination of the levels during the latter part of the project (especially months 9-23) and was led by Paderborn University. MDH and LUT contributed. Its objectives were to identify stakeholders and sub-levels of this level (e.g., policy-makers, funding organisations, research organisations, workers' and employers' organisations, interest organisations in the field of care robotics, but even others, such as the general public); and develop methods of orientation. WP4 also observed impacts of the new methods and models for orientation and focused on the link between care robot orientation and the societal level to reach wider level conclusions. The tasks in WP 4 were recognising the critical points and potholes in orientation at this level (field data, literature and evaluative interviews); analysis of structures for orientation; development of methods for orientation; identification of fruitful combinations of the orientation methods and communication about those across the levels (including also tools for visualisation of information); and drafting recommendations concerning communication related to orientation.

WP 4 proceeded efficiently. Comprehensive interview data were collected also in this WP. In each country, 10-11 interviews were conducted in 2019. The interviewees were political decision-makers, research institutes, insurance organisations, funding organisations, and the media. The results of WP 4 are reported in a journal manuscript on trust in technology by public opinion leaders, submitted to *Health Policy*. The results were also reported on in the project's final seminar in March 2020 and a gerontechnology (ISG) conference in October 2020 as well as in presentations to stakeholders.

The interview data collected in WP 4 provided central knowledge for the planning of the co-creation workshops, survey and experiment, as well as the orientation guide and the animation. The orientation guide and the animation were produced in co-creative processes in close cross-WP interaction between all the WPs. WP 4 provided knowledge related to macro-level actors and their tasks in care robot orientation. Joint work to combine the results and the micro-, meso- and macro-levels focused

on these events, tasks and outputs that were completed during the project. These correspond to the WP 4 tasks. In particular, the orientation guide and animation were designed paying attention to proper visualisation of information.

WP 4 also contributed to the survey data collection for the joint article on assistant nurses' views of and needs for care robot orientation in the three European countries. All of the data collection (interviews, surveys, etc.) was planned, prepared and implemented in close cross-WP and cross-country collaboration.

In WP 4, also an economic experiment was conducted, on the platform MTurk with 163 individuals, to understand how quality uncertainty affects individuals' decisions for or against robotic care. The results were compiled into a manuscript which will be submitted to a journal soon.

Achievements WP 5

Please describe the achievements of work package 5 in relation to the initially planned objectives (max. 2 pages).

WP 5 was implemented throughout the project and was led by LUT. WP 5 led and coordinated the stakeholder engagement and interaction for this project. The main objective was to increase the level of awareness, knowledge and networking around orientation all the above-mentioned stakeholders and participants. The project, from the very beginning, actively pursued dialogue and mutual learning between the researchers and the stakeholders. WP5 also took care of that the research work in the project would be transparent and communicative in nature. WP5 utilised different methods to satisfy the demand for high-quality stakeholder engagement. The tasks were interaction with the general public, stakeholder engagement and tasks related to scientific dissemination.

WP 5 – like the other WPs – progressed well. In practice, all the country teams were involved in very active stakeholder engagement and interaction in their own countries. This is shown by the details listed in sections 7-9 and 11 of this report. In addition, international efforts were made. The progress corresponded to the interaction plan in the proposal, and objectives of interaction were reached. The identified key actors, facilitators and stakeholders of the project were engaged in one way or another; at the micro-level: customers (older people and their relatives), caregivers, care managers; at the meso-level: care organisations, municipalities, technology companies, service providers; at the macro-level (national; international, as appropriate): policy-makers, funding organisations, research organisations, workers' and employers' organisations, interest organisations in the field of service robotics, insurance companies, older people's interest organisations, and the media. Assistant nurses, as a particular professional group, were involved with the help of a survey in all the three countries. Interaction with the general public and stakeholders took many forms, such as interviews and workshops. The stakeholder engagement and interaction continued in the dissemination of the results also beyond the project. For example, the website of the project stores the orientation guide and the animation in the different languages (English, Finnish, Swedish, German), and the website address was chosen so that it would be timeless (not bound to the project title).

Scientific dissemination was described in the previous WPs. Apart from written outputs, the interaction with other researchers was active, and many new contacts have been established – individuals or networks – during ORIENT, and also after it.

Please insert further tables to add more work packages, as appropriate.

4.3 Deviations from the original work plan

Please describe any significant deviations from the original work plan at the level of the overall project and each individual work package. Describe how any deviations differ from the original plan and give clear reason(s) for the deviation(s) or anything not achieved to date.

There were no significant deviations from the original work plan (including the specifications in the one-page response to reviews during the rebuttal stage of July 2017) in the individual WPs.

The deviation at the level of the overall project was that no international Advisory Board was appointed. Instead, key stakeholders in the three countries (for example, managers of care organisations, ministry representatives, national robotics programme representatives, researchers) provided support, guidance and channels for dissemination of information on the project and its results – that is, tasks of advisory board members. Yet, many of them were also informants in our data collection due to their extensive experience and knowledge that few people still possess in this rapidly developing field of care robotics. Had they been in an advisory board, it could have resulted in a bias. The liaison person, Prof. Jens Dangschat, appointed by JPI MYBL for the second year of the project, also provided support and guidance to us. He attended the project meeting and workshop at Paderborn University on 19 September 2019 and the final seminar in Lahti on 12 March 2020.

The above-mentioned interactive workshop at Paderborn University provided an excellent opportunity for the whole consortium to discuss the project with the above-mentioned stakeholders from Germany. The final (open and also recorded) ORIENT seminar was held at LUT University in Lahti, Finland in March 2020 (during the first pandemic-related travel restrictions) and provided an opportunity for discussion with stakeholders from Finland and some from Sweden. Altogether 75 people of different backgrounds registered to the seminar, and the recordings were also made available on the ORIENT website. Very unfortunately, the German partners faced travel restrictions the day before the seminar, but they participated online.

The decision of not appointing one international Advisory Board was also based on careful consideration of associated costs and time use in our two-year project. Inviting board members from different countries (in a balanced way) to two international meetings would have resulted in significant costs, and finding suitable dates would have been a challenge, for example, for those working in care organisations. Remote connections, again, were felt not to provide the same discussion experience when people do not know each other. Language barriers would also have existed, as our initial intention was to invite diverse people, not only 'international experts'. Despite the deviation, we are convinced that we received as much support and guidance as we would have received from a joint international Advisory Board (if not more).

5 Key Findings and Recommendations

Please describe the key high-level findings of the research for each work package (max. four key findings per work package) and highlight recommendations associated with each key finding (e.g., recommendations for policy or practice).

WP 1 Management and coordination	
Key findings	Recommendations
<i>Not applicable (not research-focused).</i>	
WP 2 Orientation at the micro-level	
Key findings	Recommendations
The need for care robot orientation is general in society. In the absence of knowledge about care robots, it is nearly impossible to know what to ask for or what to actually seek information about.	Care robot orientation must be founded on agile implementation planning for care robots, with a firm basis in trustworthy knowledge and information and respecting individuals' wishes.
Four central aspects of care robot orientation were identified: (1) <i>What</i> is care robot orientation? (2) <i>Why</i> is it necessary? (3) <i>Who</i> needs it and by <i>Whom</i> should it be given? (4) <i>How</i> should it be performed?	The <i>What, Why, Who/Whom</i> and <i>How</i> aspects of care robot orientation can be used as a foundation for the creation of orientation models, which may facilitate structured and goal-oriented care robot orientation strategies.
WP 3 Orientation at the meso-level	
Key findings	Recommendations
There are many types of knowledge needs on care robots, which are related, for example, to technologies, user contexts and service integration.	Multi-sided and relevant knowledge on care robots should be raised in society, in order to relieve fears concerning care robot use, but also to give realistic impressions of robots' actual capabilities.

Meso-level actors' (such as service providers, companies, education and interest organisations) role in care robot orientation is central as a mediator between the grassroots (micro) level and broader societal (macro) level.	Meso-level actors' role as an important mediator between levels (e.g. between policy actors and users) in care robot orientation should be acknowledged and strengthened, for instance, with relevant policy measures.
Advancing and hindering elements in embedding care robots into society and practice are both technical and social in nature. It is important to understand the mutual effects between technology and social practices in the related socio-technical transition.	User participation in the development processes and robot implementation, and continuous dialogue between different sectors and levels of society is needed to increase the benefits of robotic technology. Systems thinking is vital for identifying important questions, making informed choices, and recognising their impacts.

WP 4 Orientation at the macro-level and combination of the levels	
Key findings	Recommendations
Public opinion leaders are aware of the possibilities that robots in care entail in times of lack of skilled caregivers but are cautious to speak up for this because of the lacking adequate information structure and a generally perceived negative mood of society towards robotics in care.	Structured information dissemination and practical experiences are required; for example, informing about the possibilities of using care robots.
Four categories of trust related to care robots were identified: trust in the health care system, trust in regulations, trust in technology and interpersonal trust.	Raising relevant knowledge on care robots and trust for them in everyday care should be increased.

WP 5 Stakeholder engagement and interaction	
Key findings	Recommendations
<i>Not applicable (not research-focused).</i>	

Please insert further tables to add more work packages, as appropriate.

6 Milestones

Please describe the milestone(s) for each work package and indicate when you achieved each milestone, leaving the final column blank if the milestone was not achieved.

WP	Milestone	Date achieved
WP 1	MS 1.1 Four face-to-face project meetings have been organised	13 March 2020
	MS 1.2 Regular online meetings have been organised	31 March 2020
	MS 1.3 Two open events have been organised for stakeholders	12 March 2020
WP 2	MS 2.1 Data collection has been concluded at the micro-level	29 Oct 2018
	MS 2.2 Data analysis has been concluded at the micro-level	30 Nov 2018
	MS 2.3 Manuscript(s) on the micro-level results have been prepared and submitted	14 Nov 2019
WP 3	MS 3.1 Data collection has been concluded at the meso-level	31 Jan 2019
	MS 3.2 Data analysis has been concluded at the meso-level	30 April 2019
	MS 3.3 Manuscript(s) on the meso-level results have been prepared and submitted	19 Dec 2019
WP 4	MS 4.1 Data collection has been concluded at the macro-level	31 March 2019
	MS 4.2 Data analysis has been concluded at the macro-level	30 June 2019
	MS 4.3 Manuscript(s) on the macro-level results have been prepared and submitted	14 Jan 2021
WP 5	MS 5.1 The visual designer for the orientation guide and the animation has been chosen (competitive tendering)	10 Oct 2019
	MS 5.2 Manuscripts for the guide and the animation have been prepared and recordings for the animation have been conducted	13 Feb 2020
	MS 5.3 Guides and animations have been published in four languages	12 March 2020
	MS 5.4 Information on these outputs has been widely disseminated	31 March 2020 (and continuing)

Please insert further rows to add more deliverables, as appropriate.

7 Deliverables

Please describe the deliverable(s) for each work package and indicate when you achieved each deliverable, leaving the column blank if the deliverable was not achieved. In addition, please report the dissemination level (i.e., public, confidential) and the format of the deliverable (e.g., report, video). Please collate copies of all the deliverables in a ZIP-file and submit the file along with this report. Please name the individual items in the ZIP-file identically to the deliverable names in the table below to enable easy identification.

WP	Deliverable name	Date achieved	Dissemination level	Format	Attached
WP 1	D1.1 Mid-term report to JPI MYBL	3 Oct 2019 (submitted)	Confidential	Report	No
WP 1	D1.2 Final report to JPI MYBL	27 Feb 2021 (submitted)	Confidential	Report	(Current report)
WP 2	D2.1 Report on care robot orientation on the micro-level	21 Jan 2020 (published)	Public	Journal article	Yes
WP 2	D2.2 Report on expectations and perceptions of older people concerning care robots	15 April 2020 (published)	Public	Book chapter	Yes
WP 3	D3.1 Report on care robot orientation on the meso-level	23 June 2020 (published)	Public	Journal article	Yes
WP 4	D4.1 Report on care robot orientation on the macro-level	Not yet published (in review)	Public	Journal article (submitted)	Yes
WP 5	D5.1 Guide on care robot orientation	12 March 2020 (published)	Public	Report (in four languages)	Yes (in four languages)
WP 5	D5.2 Animation on care robot orientation	12 March 2020 (published)	Public	Animation (in four languages)	No (available on www.robotorientation.eu and on YouTube)

Please insert further rows to add more deliverables, as appropriate.

Note from the authors: The other core outputs are listed in Section 8.

8 Outputs

8.1 Publication list

Please list the publications that resulted from the funded project and indicate which type of publication (e.g., peer reviewed article, book/book chapter, review, communication in scientific congress, dissertation, other).

Title	Type
Tuisku, O., Johansson-Pajala, R.-M, Hoppe J.A., Pekkarinen, S., Hennala, L., Thommes., K. Gustafsson, C., Melkas H. Assistant nurses and care robot orientation - Case: Finland, Germany and Sweden. Submitted to <i>Behaviour & Information Technology</i> .	Article submitted for peer review
Hoppe, J., Melkas H., Pekkarinen, S., Tuisku. O., Hennala, L., Johansson-Pajala, R.-M., Gustafsson, C., Thommes., K. Perception of society's trust in care robots by public opinion leaders. Submitted to <i>Health Policy</i> .	Article submitted for peer review
Thommes, K., Johansson-Pajala, R.-M., Gustafsson, C., Pekkarinen, S., Tuisku, O., Hennala, L., Melkas, H. & Hoppe, J.A. (2020) Trust development in care robots by opinion leader in the society. <i>Gerontechnology</i> , 19(0), 1-1 http://doi.org/10.4017/gt.2020.19.s.70024.4	Abstract published in a journal
Johansson-Pajala, R.-M., Thommes, K., Hoppe, J.A., Tuisku, O., Hennala, L., Pekkarinen, S., Melkas, H. & Gustafsson, C. (2020) The need for care robot orientation in elder care services. <i>Gerontechnology</i> , 19(0), 1-1 http://doi.org/10.4017/gt.2020.19.s.69574	Abstract published in a journal
Pekkarinen, S., Hennala, L., Tuisku, O., Gustafsson, C., Johansson-Pajala, R.-M., Thommes, K., Hoppe, J. & Melkas, H. (2020). Care robots in society: Knowledge and orientation needs. <i>Gerontechnology</i> , 19(0), 1-1 https://doi.org/10.4017/gt.2020.19.s.69664	Abstract published in a journal
Johansson-Pajala, R.-M., Thommes, K., Hoppe J.A., Tuisku, O, Hennala, L., Pekkarinen, S., Melkas, H. & Gustafsson, C. Care robot orientation - What, Who and How? Potential users' perceptions. <i>International Journal of Social Robotics</i> (2020). https://doi.org/10.1007/s12369-020-00619-y	Peer reviewed article
Satu Pekkarinen, Lea Hennala, Outi Tuisku, Christine Gustafsson, Rose-Marie Johansson-Pajala, Kirsten Thommes, Julia A. Hoppe, Helinä Melkas. Embedding care robots into society and practice: Socio-technical considerations. <i>Futures</i> 122. https://doi.org/10.1016/j.futures.2020.102593	Peer reviewed article
Hoppe, J.A., Thommes, K., Johansson-Pajala, R.-M., Gustafsson, C., Melkas, H., Tuisku, O., Pekkarinen, S., and Hennala, L. (2020). Technologieorientierung zu Assistenzrobotik – Welche Akzeptanz besteht bei der Einführung von Assistenzrobotik für die Pflege älterer Menschen? <i>Industrie 4.0 Management</i> . (In German.)	Peer reviewed article
Johansson-Pajala, R.-M. & Gustafsson, C. (2020). Significant challenges when introducing care robots in Swedish elder care. <i>Disability & Rehabilitation – Assistive Technology</i> . https://doi.org/10.1080/17483107.2020.1773549	Peer reviewed article
Johansson Pajala, R.-M., Thommes, K., Hoppe, J. A., Melkas, H., Tuisku, O., Hennala, L., Pekkarinen, S. & Gustafsson, C. (2019). Improved Knowledge Changes the Mindset: Older Adults' Perceptions of Care Robots. <i>HCI2019, Conference Proceedings</i> . Springer. DOI: 10.1007/978-3-030-22012-9_16	Peer reviewed conference paper
Melkas H. (2018). Hoivarobotit ja hyvinvointipalvelujen kehittäminen (Care robots and development of welfare services; in Finnish). <i>Työn Tuuli</i> 1/2018, 25-36. ISSN 2343-2055.	Other (article in a professional magazine)

https://www.henry.fi/media/ajankohtaista/tyontuuli/tyontuuli_012018_20180521_1.pdf (in Finnish).	
Hoppe, J.A., Johansson-Pajala, R.-M., Gustafsson, C., Melkas, H., Tuisku, O., Pekkarinen, S., Hennala, L., and Thommes, K. (2020). Assistive robots in care: Expectations and perceptions of older people. In: J. Haltaufderheide, J. Hovemann, J. Vollmann (Eds.): Aging between participation and simulation – Ethical dimensions of socially assistive technologies in elderly care, De Gruyter, 139-156. DOI: 10.1515/9783110677485	Book chapter
Helinä Melkas, Christine Gustafsson, Lea Hennala, Satu Pekkarinen, Outi Tuisku, Kirsten Thommes, Julia A. Hoppe, Rose-Marie Johansson-Pajala (2020): Care robotics: Orientation pathways for users and the society. Lappeenranta-Lahti University of Technology LUT, LUT Scientific and Expertise Publications – Research Reports 106.	Other (a guide)
Helinä Melkas, Christine Gustafsson, Lea Hennala, Satu Pekkarinen, Outi Tuisku, Kirsten Thommes, Julia A. Hoppe, Rose-Marie Johansson-Pajala (2020): Vårdrobotar. Orienteringsvägar för användare och samhället. Lappeenranta-Lahti University of Technology LUT, LUT Scientific and Expertise Publications – Research Reports 107. (In Swedish.)	Other (a guide)
Helinä Melkas, Christine Gustafsson, Lea Hennala, Satu Pekkarinen, Outi Tuisku, Kirsten Thommes, Julia A. Hoppe, Rose-Marie Johansson-Pajala (2020): Pflegerobotik: Orientierungswege für Nutzer und Gesellschaft. Lappeenranta-Lahti University of Technology LUT, LUT Scientific and Expertise Publications – Research Reports 108. (In German.)	Other (a guide)
Helinä Melkas, Christine Gustafsson, Lea Hennala, Satu Pekkarinen, Outi Tuisku, Kirsten Thommes, Julia A. Hoppe, Rose-Marie Johansson-Pajala (2020): Hoivarobotiikka: Perehdyttämisen polkuja käyttäjille ja yhteiskunnalle. Lappeenranta-Lahti University of Technology LUT, LUT Scientific and Expertise Publications – Research Reports 105. (In Finnish.)	Other (a guide)
Helinä Melkas, Christine Gustafsson, Lea Hennala, Satu Pekkarinen, Outi Tuisku, Kirsten Thommes, Julia A. Hoppe, Rose-Marie Johansson-Pajala (2020): Hoivarobotiikka. Perehdyttämisen polkuja käyttäjille ja yhteiskunnalle. (An animation). Lappeenranta-Lahti University of Technology LUT, LUT Scientific and Expertise Publications. Lecture Notes 12. (In Finnish.)	Other (an animation)
Helinä Melkas, Christine Gustafsson, Lea Hennala, Satu Pekkarinen, Outi Tuisku, Kirsten Thommes, Julia A. Hoppe, Rose-Marie Johansson-Pajala (2020): Care robotics: Orientation pathways for users and the society. (An animation). Lappeenranta-Lahti University of Technology LUT, LUT Scientific and Expertise Publications. Lecture Notes 13.	Other (an animation)
Helinä Melkas, Christine Gustafsson, Lea Hennala, Satu Pekkarinen, Outi Tuisku, Kirsten Thommes, Julia A. Hoppe, Rose-Marie Johansson-Pajala (2020): Vårdrobotar. Orienteringsvägar för användare och samhället. (An animation). Lappeenranta-Lahti University of Technology LUT, LUT Scientific and Expertise Publications. Lecture Notes 14. (In Swedish.)	Other (an animation)
Helinä Melkas, Christine Gustafsson, Lea Hennala, Satu Pekkarinen, Outi Tuisku, Kirsten Thommes, Julia A. Hoppe, Rose-Marie Johansson-Pajala (2020): Pflegerobotik: Orientierungswege für Nutzer und Gesellschaft. (An animation). Lappeenranta-Lahti University of Technology LUT, LUT Scientific and Expertise Publications. Lecture Notes 15. (In German.)	Other (an animation)

8.2 Presentations at (scientific) conferences and symposia, including JPI MYBL activities

Please list the presentations at (scientific) conferences and symposia that resulted from the funded project.

Presentation	Date
[Title presentation] at [name scientific conference] by [presenter name]	
Assistant robots in care: A contemporary orientation of older people towards robotic assistance, Workshop Aging between Participation and Simulation Ethical Dimensions of Socially Assistive Technologies, Julia Amelie Hoppe (the peer-reviewed paper was published in a book in 2020), Ruhr University Bochum	4-8.02.2019
Assistant robots in care: New models for effective orientation, DEWU German Wound Congress & Bremen Nursing Congress, 08 - 10 May 2019, Julia Amelie Hoppe	08-10.05.2019
Seminar on wellbeing coaching, organized by Hyteairo – the Finnish national programme on artificial intelligence and robotics for the well-being and health sector, Helsinki, Finland > Prof. Helinä Melkas was invited as a speaker	25.10.2018
Can nudges increase employee performance? ILERA European Congress, Düsseldorf, Germany, Prof. Kirsten Thommes	05.-07.09.2019
Improved Knowledge Changes the Mindset: Older Adults' Perceptions of Care Robots. International Human Computer Interaction (HCI) Conference, Florida, USA. Johansson Pajala, R.-M.	28-30.07.2019
"Micro-, meso- and macro-level perspectives to welfare technology, especially care robotics". EHiN, Norway's national eHealth conference, Nordic research network seminar, Oslo, Norway. Prof. Helinä Melkas	12.-13.11.2019
COST Network, Universität Leiden, The Netherlands, Prof. Kirsten Thommes	21.-22.02.2020
The need for care robot orientation in elder care services. Presentation in ISG 2020, Trondheim, Norway (Virtual conference), 7-9 October 2020, Johansson Pajala, R-M	7.-9.10.2020
Care robots in society: Knowledge and orientation needs. Presentation in ISG 2020, Trondheim, Norway (Virtual conference), 7-9 October 2020, Pekkarinen, S.	7.-9.10.2020
Trust development in care robots by opinion leaders in the society. Oral presentation in ISG 2020, Trondheim, Norway (Virtual conference), 7-9 October 2020, Thommes, K.	7.-9.10.2020
Conference Beyondwork, European Conference on labour research, Session chair, Future with care robots and co., 20-22 October 2020, Thommes, K.	20.-22.10.2020

8.3 Communications, public engagement activities and knowledge exchange events

Please list the communications, public engagement activities and knowledge exchange events where results from the funded project were shared with specific audiences, including the general public.

Activity or event	Date
Cooperation with robots. Lecture series for the University Paderborn lecture series on "Work 4.0", -> Prof. Kirsten Thommes was invited as a speaker	15.10.2018
Heinz Nixdorf Forum, Event on Loneliness 4.0- User Forum, Workshop organized by the diocese of Paderborn, Germany, Prof. Kirsten Thommes was invited as a speaker	17.11.2018
Robots in care "The solution for the nursing crisis" organized from the German Green Party -> Prof. Kirsten Thommes was invited as a speaker	10.01.2019
Future Congress from the Federal Ministry of Education and Research in Bonn on Human-Technology Interaction, Presentation of the project Orient by Prof. Kirsten Thommes and Julia Hoppe	20-23.05.2019

Use of robotized assistance systems in care: New models for effective orientation, Presentation to the Committee of Social Affairs and Health Paderborn, in the district parliament of Paderborn, Prof. Kirsten Thommes	29.09.2019
Mit Robotik die Pflege der Zukunft gestalten Projekt „Orient“ erforscht die Bedürfnisse von Fachkräften, Patienten und Angehörigen, Medizin Aspekte (German magazine on medical issues), Interview with Prof. Kirsten Thommes	25.07.2018
Projekt „Orient“ der Universität Paderborn: Mit Robotik die Pflege der Zukunft gestalten, Hellweger Anzeige, Interview with Prof. Kirsten Thommes	29.07.2019
Themenspecial „Arbeit 4.0“, FOCUS Online, Interview with Prof. Kirsten Thommes	24.07.2019
Forschungsprojekt zu Robotern in der Pflege Überwachung: Die Paderborner Wissenschaftlerin Kirsten Thommes mahnt Datenschutz an, Neue Westfälische - Paderborner Kreiszeitung, Interview with Prof. Kirsten Thommes	07.08.2018
Datenschutz genau absprechen, Mindener Tageblatt, Interview with Prof. Kirsten Thommes	08.08.2018
"Alle Beteiligten mit ins Boot holen - Projekt Orient", Die Schwester der Pfleger, 57 Jg, 9/18, S. 86-88, Interview with Prof. Kirsten Thommes	18.09.2018
Regeln für Roboter, Max Planck Forschung, 3/18, Interview with Prof. Kirsten Thommes	18.10.2018
Roboter in der Pflege, Humanistischer Pressedienst, Interview with Prof. Kirsten Thommes	16.10.2018
Ohne ethische Leitplanken kommen wir nicht aus, Malteser in der Erzdiözese Paderborn, Interview with Prof. Kirsten Thommes	18.11.2018
Roboter und Senioren, Experten: Technik in der Pflege hilfreich, aber auch ethisch fragwürdig, Westfälisches Volksblatt die Informative, Interview with Prof. Kirsten Thommes	18.01.2019
Soziale Pflege-Roboter setzen sich nur langsam durch, Deutschlandfunk Podcast Interview with Prof. Kirsten Thommes	18.02.2019
Interview with Prof. Helinä Melkas on care robotics, published in eight Finnish newspapers (online and print versions) (Etelä-Suomen Sanomat, Keski-Suomalainen, Karjalainen, Savon Sanomat, Länsi-Uusimaa, Keski-Uusimaa, Uusimaa & Aamuposti)	6.3.2019
"RoboSote" seminar (on robotics and social and healthcare) organized by Mediutiset, Helsinki, Finland -> Prof. Helinä Melkas was invited as a speaker	13.6.2018
Seminar "Care work is changing", organized by SavoGrow, Suonenjoki, Finland -> Prof. Helinä Melkas was invited as a speaker	20.8.2019
"Smart Cities in Smart Regions" conference, organized by Lahti University of Applied Sciences, Finland -> Prof. Helinä Melkas was invited as the moderator of a roundtable discussion on innovations and wellbeing	5-6.9.2018
30 th anniversary seminar organized by Tammenlehväkeskus, a care service organization, Tampere, Finland -> Prof. Helinä Melkas was invited as a speaker	8.11.2018
Two seminars on transition in working life, organized by Finnish Federation of Graduate Women, Lappeenranta and Lahti, Finland -> Prof. Helinä Melkas was invited as a speaker	20.11.2018 4.2.2019
Seminar on Gerontechnology, organized by City of Helsinki, Social services and health care division, Helsinki, Finland -> Prof. Helinä Melkas was invited as a speaker	11.12.2018
Training day of Helsinki University Hospital/ Neurology, Helsinki, Finland -> Prof. Helinä Melkas was invited as a speaker	4.3.2019
Editorial to "Haava" magazine (for wound care professionals, Finland) -> Prof. Helinä Melkas was invited as the author	October 2018
Interview of Prof. Helinä Melkas for "Nuori lääkäri" magazine (for young medical doctors, Finland)	October 2018

Nordic Research Network: Health and Welfare Technology, constitutive meeting at HIMSS 2019 conference, Helsinki, Finland -> Christine Gustafsson (the initiator), Rose-Marie Johansson-Pajala and Helinä Melkas attended	12.06.2019
Forte Magasin, Mars 2019: Människa eller maskin i framtidens äldreomsorg. (An article in the Swedish funder's magazine.)	March 2019
Arena-day, MDH Eskilstuna, Sweden (presentation of the orient project by Rose-Marie Johansson-Pajala).	22.05.2019
Neue Westfälische – Paderborner Kreiszeitung, Workshop über Roboter in der Pflege	25.07.2019
Westfälisches Volksblatt, Roboter in der Pflege?	28.08.2019
Pressemitteilung der Universität Paderborn, Roboterassistenz für Pflegedienstleistungen: Workshop schafft Verbindung von Theorie und Praxis	28.08.2019
Welfare technology, Aros congress, Västerås, Sweden. (ORIENT project presentation by Christine Gustafsson)	01.09.2019
Future elderly care, Västerås länsmuseum, Sweden. (ORIENT project presentation by Christine Gustafsson and Rose-Marie Johansson-Pajala)	17.09.2019
Local fair on Welfare technology, MDH Eskilstuna, Sweden. (ORIENT project presentation by Christine Gustafsson)	13.10.2018
Local fair on Welfare technology, MDH Eskilstuna, Sweden. (ORIENT project presentation by Christine Gustafsson)	24.09.2019
“Care robot orientation - potential users’ perspective”, presentation by Christine Gustafsson and Rose-Marie Johansson-Pajala, in a workshop “Robots as assistants in care? How could robots be used in care in the future and what has to be considered?” 19 September 2019, Paderborn, Germany. “Not rushing by force but proceeding with dialogue” – Embedding care robots into society and practice” presentation by Helinä Melkas, Satu Pekkarinen, Lea Hennala and Outi Tuisku, in a workshop “Robots as assistants in care? How could robots be used in care in the future and what has to be considered?” 19 September 2019, Paderborn, Germany.	19.09.2019
ORIENT project presentations at JPI MYBL's JTC 2017 Events (Networking event of JTC 2017 projects, and Progress dialogue meeting with the Scientific Advisory Board and the Societal Advisory Board), 11.-12.12.2019, The Hague, Netherlands. (Helinä Melkas)	11.- 12.12.2019
Presentations in the ORIENT final seminar: Care robots in welfare services: Pathways to effective orientation. Lahti, Finland. <ul style="list-style-type: none"> • Opening words, presentation by Helinä Melkas, LUT University • A foundation for increased knowledge, understanding and conceptualization of care robots in elderly care, presentation by Christine Gustafsson & Rose-Marie Johansson-Pajala, Mälardalen University • Care robot orientation at the meso level of society: Knowledge needs and practical implications, presentation by Satu Pekkarinen, LUT University • Trust development in care robots by opinion leaders in the society, presentation by Kirsten Thommes and Julia A. Hoppe, Paderborn University • Assistant nurses' views on care robot orientation: Survey results. Presentation by Outi Tuisku and Rose-Marie Johansson-Pajala, LUT University and Mälardalen University 	12.03.2020
PUZ, Paderborner Universitätszeitschrift (2-2019/2020), Roboter ersetzen nicht das Recht auf menschliche Nähe	2-2019/2020
Beyondwork, Conference Beyondwork, European Conference on labour research https://rp-online.de/wirtschaft/konferenz-beyondwork-diskutiert-zukunft-mit-pflege-roboter-und-co_aid-54071801	18.10.2020

Presentation at the welfare technology seminar of LAB University of Applied Sciences, 25 November 2020. Helinä Melkas	25.11.2020
Presentation at <i>Tieteen päivät</i> (Science days), University of Helsinki, 14 January 2021. (Available on YouTube.) Helinä Melkas	14.01.2021
"ERA-LEARN: enabling systematic interaction with the P2P community", ERA-LEARN Country Report Finland; interview on ORIENT and JPI MYBL with Prof. Helinä Melkas (published in February 2021)	29.10.2020
Newspaper articles	
Newspaper article: Projekt „Orient“ der Universität Paderborn: Mit Robotik die Pflege der Zukunft gestalten. 18.10.2020n. Medizin Aspekte.	25.07.2018
Newspaper article: Memory spielen und tanzen mit Robbie. Hellweger Anzeige.	29.07.2018
Newspaper article: Themenspecial „Arbeit 4.0“ FOCUS Online,	24.07.2018
Newspaper article: Forschungsprojekt zu Robotern in der Pflege Überwachung: Die Paderborner Wissenschaftlerin Kirsten Thommes mahnt Datenschutz an. Neue Westfälische - Paderborner Kreiszeitung,	07.08.2018
Newspaper article: Datenschutz genau absprechen. Mindener Tageblatt.	08.08.2018
Newspaper article: Projekt „Orient“ der Universität Paderborn: Mit Robotik die Pflege der Zukunft gestalten. Medizin Aspekte.	08.18
Newspaper article: "Alle Beteiligten mit ins Boot holen - Projekt Orient". Die Schwester der Pfleger, 57 Jg, 9/18, S. 86-88,	09.18
Newspaper article: Regeln für Roboter, Max Planck Forschung,	3/18, 10.18
Newspaper article: Roboter in der Pflege. Humanistischer Pressedienst, https://hpd.de/artikel/roboter-pflege-16060 .	16.10.2018
Newspaper article: Ohne ethische Leitplanken kommen wir nicht aus. Maltester in der Erzdiözese Paderborn.	18.11.2018
Newspaper article: Roboter und Senioren, Experten: Technik in der Pflege hilfreich, aber auch ethisch fragwürdig. Westfälisches Volksblatt die Informativ.	18.01.2019
Newspaper article: Soziale Pflege-Roboter setzen sich nur langsam durch. Deutschlandfunk.	18.02.2019
Newspaper article: Workshop über Roboter in der Pflege. Neue Westfälische - Paderborner Kreiszeitung.	25.07.2019
Workshop über Roboter in der Pflege. Homepage Universität Paderborn.	25.07.2019
Newspaper article: Roboter in der Pflege? Westfälisches Volksblatt.	28.08.2019
Newspaper article: Roboterassistenz für Pflegedienstleistungen: Workshop schafft Verbindung von Theorie und Praxis. Pressemitteilung der Universität Paderborn.	28.08.2019
Newspaper article: Stadt richtet Ethikrat ein, Gremium prüft und bewertet Digitalisierungsbestrebungen. Pressemitteilung der Universität Paderborn.	28.08.2019
Newspaper article: Stadt richtet Ethikrat ein, Gremium prüft und bewertet Digitalisierungsbestrebungen	28.08.2019
Newspaper article: Stadt richtet Ethikrat ein, Gremium prüft und bewertet Digitalisierungsbestrebungen.	24.10.2019
Newspaper article: Roboter ersetzen nicht das Recht auf menschliche Nähe. PUZ, Paderborner Universitätszeitschrift (2-2019/2020).	01.12.2019
Konferenz Beyond Work, Konferenz zur Zukunft der Arbeit, Wenn der Roboter die Pflege übernimmt https://rp-online.de/wirtschaft/konferenz-beyondwork-diskutiert-zukunft-mit-pflege-roboter-und-co_aid-54071801 . RP online.	18.10.2020

News on the YLE (the Finnish Broadcasting Company) website on the care robot orientation guide (https://yle.fi/uutiset/3-11399020)	12.6.2020
News on the care robot orientation guide in the Helsinki EU Office newsletter (https://us15.campaign-archive.com/?u=09f2ceae2006d6a7135de8949&id=efc3d35a9d)	25.6.2020

9 Impact

9.1 Scientific impact

Describe the nature of the major scientific impacts of your results, i.e. the addition to the current state of knowledge (new data, new methods, new perspective, confirmation of theses, first transnational approach). Describe to what extent the scientific impact has been promoted through the international and comparative perspective of the various members of the consortium (max. 2 page).

ORIENT aimed at smoothening the co-evolution of care robot technology and user-driven service innovations by identifying, characterising and developing best practices for orientation into care robot use at the different levels of the innovation ecosystem (consisting of all the different stakeholders). This was also expected to contribute to economic objectives, such as more effective use of technology in welfare services, with careful attention to the needs of responsible research. Additions to the current state of knowledge were produced through the comprehensive, multi-level and multi-stakeholder interview data from the three countries; survey data also from the three countries; and data from the co-creation workshops and experiment. New perspectives were created, rather than existing ones confirmed, as we were dealing with a rapidly developing field, where transnational research is still largely missing.

The project built on close cross-cultural collaboration and exchange of experiences within the area of orientation, as has been described in the context of the WPs. This promoted the scientific impact, which is partly still forthcoming, as, for example, journal publication processes take some time from the first submission onwards. Still, during the two-year project, we managed to publish four peer-reviewed journal articles, one reviewed chapter in an edited volume, and one peer-reviewed conference paper, in addition to numerous other publications (see 8.3). The publication channels represented many research fields, such as human-robot interaction, futures studies and rehabilitation, so the project's scientific impact has touched several research fields. The international perspective was highly fruitful, as all the countries are still taking the first steps in care robot use. In our scientific reporting, we were making differences across the countries visible, thus enabling transnational learning and knowledge exchange, even beyond the project. In our view, the comparative approach of the three countries with rich datasets (both qualitative and quantitative) is a remarkable contribution, considering the stage of the research on care robot use. To our knowledge, fields of research and practice concerning this topic of care robot orientation have not been combined in the way they were combined in ORIENT. For instance, mapping of the aspects of *What, Why, Who/Whom* and *How* of care robot orientation offers a foundation for the creation of orientation models tailored for specific contexts, which may facilitate structured and goal-oriented care robot orientation strategies.

The project also linked the traditionally practice-oriented theme of orientation to the theories of sociotechnical transition where new technologies are seen to contribute to broader societal changes, not alone, but with constant "negotiations" with user preferences and thinking models, policies, infrastructures, markets and science. The use of this well-known framework brought additional channels for scientific impact and visibility. For instance, advancing and hindering elements in embedding care robots into society and elder care practices were identified in the project. Our study, published in a journal, showed that these elements are both technical and social in nature, and strongly intertwined, and these can be drivers for different future scenarios. Also, the question of trust – technology trust in society – was studied in the project, and a journal article was submitted on the topic.

By working in the project, we thus contributed to the scientific knowledge about care robots and different stakeholder groups' attitudes, knowledge and discussions on the topic. So far, the use of care robots has been sparse in Germany, Sweden and Finland. With the help of the project, we highlighted the potential but also obstacles of care robot implementation. We, for instance, mapped expectations and perceptions of different stakeholder groups regarding care robots. The project's

focus on care robot orientation contributed with research-based insights and knowledge for improved societal and professionals' knowledge on care robot orientation in our countries.

9.2 Societal impact

Describe the impact of the results on different target groups (e.g., health professionals, policy makers, patients), including the pathway to reaching this impact. Describe how the results have been or will be used, disseminated and implemented by each target group, including beyond the lifetime of the project (max. 2 page).

Scientific and societal impact are in many ways intertwined, so please see the first paragraph of 9.1, too. On the one hand, we have paid careful attention to communication of the scientific results in appropriate ways to reach the different target groups (or, rather, co-creation partners); on the other, their reactions and support have brought new ideas that can be utilised to contribute to societal impact even far beyond the lifetime of the project.

Societal impact was at the core of ORIENT. Societal value was created by the theme itself, use of care robots in services, which is inherently societally relevant. It was also created by transdisciplinarity in the research, close anchoring in the practical circumstances and needs of older people, their relatives, care personnel, care organisations, and other stakeholders (please see the other sections), and commitment to share knowledge and contacts via multiple channels. This research was relevant for the renewal of business life, too.

The care robot orientation guide and the related animation that were prepared on the basis of the results of all our WPs are especially usable for the different stakeholders at different levels, including policy-making. Our results highlighted that if the issues related to care robot orientation continue to be overlooked, it is quite likely that benefits of care robot use will not be reached, and stranded investments will be made. Our results highlighted orientation as a co-creative learning process where the users' role is central. The results were and are still being communicated to decision-makers also with a view to development of legislation. As robotisation is only taking its first steps in all the three countries, the legislation is not yet up-to-date. In particular, various ethical issues related to robot use in care were communicated, as far as they were identified during the research. Such information may also be relevant at the level of international policy-making and standards even later on. Naturally, we cannot secure implementation by each target group, but emphasised its importance in all our activities.

The results are also used in teaching future professionals both from care and engineering fields. Project themes and results were, for example, incorporated into LUT University's teaching (courses on digitalisation and sustainable organizational renewal, user perspectives on welfare technology, as well as continuing education courses) and guest lectures on service robotics at South-Eastern Finland University of Applied Sciences, 2018-2021. The care robot orientation guide and animation will be used in education at educational organisations of different levels in our countries. Many of our stakeholders helped in the dissemination of the guide and animation to care organisations and education (in Finland, for example, the trade union of assistant nurses, SuPer, and the national Hyteairo programme of the Ministry of Social Affairs and Health).

In summary, from the point of view of individuals, the societal impact is related to overcoming pitfalls in care robot use for older people's wellbeing; to user-friendly and effective use of care robots, and to benefiting from new opportunities provided by care robots. Through better orientation, the use of robots will be more understandable and meaningful. The gap between technology and older people may decrease, and this may reduce their digital exclusion. In order to respond to this, the project has produced more context-related, user-oriented orientation methods related to care robots – for older people, professional caregivers and other stakeholders. These have been presented particularly in the care robot orientation guide and the animation, which highlight providing information in an

understandable and meaningful way. This may contribute to increased agency and autonomy of older people.

ORIENT also produced policy impacts, such as: 1) increased understanding about the importance of orientation and its different levels and aspects in the introduction and implementation of care robots, 2) improved awareness of the necessary resources for proper training for the professional caregivers to work with robots; and of roles of technology as part of care work and services, and 3) novel knowledge about the use of care robots as a broad-based, systemic issue requiring collaboration between different policies and sectors.

10 Data Management and Data Sharing

Describe how this project contributes to sustainable data and research infrastructures; including a description of the sustainability of the research results within the wider research community. Please take into account the [FAIR data Principles](#) and indicate if your project (partly) contributes to these principles (max. 1 page).

We paid careful attention to the sustainability of the research results within the wider research community and pursued the principles of open science with due attention to research ethics and law. We made sure that the research results produced within ORIENT are openly available. We committed to open access publishing, notably by publishing the results (peer-reviewed scientific articles) through scientifically high-quality open access publication channels, in accordance with H2020's Open Access policy. We also contributed to the sustainability of research results by openly describing our data collection; for instance, in the appendices of the scientific articles, we presented interview questions and coding schemes, and provided extensive samples of interview quotations.

The project involved different types of data collection that were planned and implemented jointly by all partners. The collected quantitative data conformed to best practices and standards, and for qualitative data, standard file formats and practices were created. The data and reports generated in the project were available to the project researchers through the jointly specified system. A strategy for the dissemination, communication and exploitation of results was finalised together during the project's second face-to-face meeting. While implementing it, the partners also had the flexibility to seize the opportunities arising at the national level, leading to a high number of different types of outputs and significant visibility for ORIENT.

All the research results of the relatively short project have not yet been published. As to the FAIR data principles, we adhere to the principle of 'as open as possible, as closed as necessary' with regard to our research data. The research data have not been made open due to privacy concerns. The participant groups included vulnerable older people, their significant others and caregivers, among others.

The main focus of the communication activities in ORIENT was to raise awareness on the progress and results of the project as well as the topic of care robot orientation. Designing, executing and managing diverse communication activities was also necessary for maintaining the stakeholders' and target groups' interest towards the project throughout its lifetime. In addition, consistent project communication was focused on to ensure that future exploitation actions could take place after the project. Exploitation actions have indeed continued to take place during the past year after the end of ORIENT, and we are thus confident about the sustainability of the research results within both the wider research community and practitioner communities. The popularised outputs of ORIENT were designed to be easily approachable also for the general public, and they have clearly gained interest. In addition, the ORIENT website (www.robotorientation.eu) was designed with a view to timelessness. The four language versions of our guide and animation on care robot orientation further contribute to the sustainability and openness.

Publicly-funded research data are valuable, long-term resources that, where practical, should be made available for secondary scientific research. Some funders expect that all data created or repurposed during the lifetime of a grant will be made available for re-use or archiving, recognising that some research data are more sensitive than others. If you have created or repurposed data as part of your project and it has been made available for re-use or archiving, please use the table below to indicate where it can be accessed and who it can be accessed by.

Dataset	Available for	Available at
Name of the dataset	Who can access the data?	Link to the dataset (if applicable)
<i>Not applicable (not opened).</i>		

11 Collaboration

11.1 Collaboration within the project

Are the academic collaborations within this project new or were these existing collaborations? How did you involve the different academic partners in the project?

The academic collaborations within the ORIENT consortium were new at the start. The different partners were involved in the planning phase of the project proposal. The partners were engaged in close collaboration during the implementation. Please see the other parts of the report for details. The small consortium was an asset in that it enabled real involvement of each individual. On the other hand, a compact consortium with close internal links also saved energy for true interaction with the various external stakeholders in the different countries.

New academic collaborations with external partners were established, with both individuals, organisations and larger networks (e.g. a COST Action network and the emerging Nordic Research Network on Health and Welfare Technology).

Existing academic collaborations were involved by, for example, knowledge exchange and preparation of new project proposals.

The following collaboration, for instance, took place within the project:

Type of party	Additional details
Nordic Research Network: Health and Welfare Technology	The new network started in May 2019; about six meetings and conference presentations; three submitted funding proposals. Representatives from Finland, Norway, Denmark and Sweden, and Nordic Welfare Centre (Stockholm).
Welfare and Health, Weltech Region, Sweden	Västerås Science Park, Almia, Västerås municipality, Region Västmanland.
Swedish Association of Local Authorities and Regions	Meetings where the ORIENT project was presented (result dissemination) and discussed.
FORTE	The Swedish research funding institution FORTE/ board members: the ORIENT project was presented to the board.
Participation in the following events by ORIENT representatives (no presentations, but public engagement and knowledge exchange):	<ul style="list-style-type: none"> • Vitalis, Gothenburg, Sweden, April 2018 • E-hälsa, Digitalisering och Välfärdsteknik, Stockholm, Sweden, 26-27 September 2018 • HIMSS Conference, Helsinki, Finland, June 2019 • AI EventHUB for Health & Welfare, Helsinki, Finland, 26 September 2019 • International JPI MYBL seminars in Helsinki, Finland, 30 October 2019 • Robotics Finland events
Finland's National Program on Artificial Intelligence and Robotics in the Well-being and Health Sector (#hyteairo)	Representation of the Finnish universities (Helinä Melkas) in the Advisory Board; interaction and knowledge exchange in meetings and other events; dissemination of ORIENT's guide and animation via their website
ROSE project partners in Finland: Aalto University, Tampere university, Laurea University of Applied Sciences, VTT	Information and result dissemination to the consortium of a large national research project on robots in welfare services (consortium events, newsletters, steering group meetings) (funder of ROSE: Strategic Research Council, Academy of Finland)

Technical Research Centre of Finland	
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11.2 Collaboration with Stakeholders

Are the collaborations with stakeholders within this project new or were these existing collaborations? How did you involve the different stakeholders in the project?

The consortium members participated actively in the societal discussion in their countries and thus increased the project's visibility. The collaborations with the stakeholders were both existing and new, in each country. We reached a large number of stakeholders from different societal levels through the interviews, in particular (please see WPs 2-4), and some of them participated in the co-creation workshops and seminars, too. With some new acquaintances, new types of collaboration have been initiated after the project. With some others, future collaboration is expected to arise; they are added to our networks for that.

In Sweden, for example, Robotdalen and representatives from Eskilstuna municipality were existing collaboration partners. In Finland, for example, care organisation managers, representatives of social and health care districts, company representatives and representatives of the national robotics program (Hyteairo) were existing collaboration partners, whereas new contacts were established through the interviews (and are maintained) to the media, insurance and political decision-makers. In Germany, stakeholders included, for instance, Caritas Association for the Archdiocese of Paderborn e.V. and Green Party Paderborn, and they were newly established contacts.

11.3 Collaboration with Patients and the Public

How did you involve patients and/or the public in the project? Were patients and the public actively involved in research design and delivery? Did decisions about the research include the patient and public perspective Note, when we refer to patient and public involvement in research we mean research being carried out with and by patients and the public, not to, for or about them (see, www.invo.org.uk). We do not mean patient and public engagement, where research information is presented or disseminated to patients and the public.

Patients – or, rather, clients (in elderly care) – were involved in the project in all the three countries. Decisions about the research did include the patient and public perspective. In general, the user focus was at the core of ORIENT. We, for example, involved interest organisations of older people, in addition to individual clients of elderly care, in focus groups and co-creation workshops. The public was involved by, for example, open invitations to events, such as the workshop at Paderborn University on 19 September 2019 and the final seminar at LUT University on 12 March 2020.

11.4 Collaboration with other JPI MYBL projects

Please describe any connections, bilateral meetings, knowledge exchange etc. between your project and other JTC projects funded by the JPI MYBL.

Connections to other projects existed within the consortium. Kirsten Thommes represented ORIENT in the JPI MYBL meeting in Brussels in February 2018. Christine Gustafsson and Rose-Marie Johansson-Pajala attended a session organised by another JPI MYBL project at HCII2019 Conference in Florida in July 2019. In Finland, a meeting among the Finnish consortia members was organised in 2018, and Helinä Melkas attended. Other projects' representatives were informed about the Paderborn workshop (19 Sept. 2019), but they were unable to attend. Helinä Melkas attended the JPI MYBL events in Finland (30 Oct. 2019) and the Netherlands (12 Dec. 2019). We also sent invitations to the final seminar in Lahti on 12 March 2020 to the other projects of the 2017 Call, and sent them the care robot orientation guide and animation in the different languages after the seminar.

In addition, there were some other connections between ORIENT and the other projects (notably with ACCESS, in the form of knowledge exchange).

11.5 Collaboration with other European/national projects

Please describe actual and intended collaborations with other European/national projects (e.g. collaboration with related projects not funded by JPI MYBL).

The Nordic Research Network on Health and Welfare Technology is not a project, but a promising avenue for future collaboration also with projects in the Nordic countries and beyond. Christine Gustafsson, Rose-Marie Johansson-Pajala and Helinä Melkas are active members in it. The Network started its activities during ORIENT, in June 2019.

Another network initiative was collaboration for a COST Action proposal 'AAL TRUSTTECH'. Kirsten Thommes is a WP leader and Helinä Melkas a participant in it. The proposal is in review.

In Sweden, there was collaboration in research funding proposals to Vinnova with Robotdalen as well as with Västerås Science park, MODIG project.

In Finland, there was collaboration with national projects, for example, the project entitled 'Robots and the future of welfare services' (ROSE), funded by Academy of Finland, Strategic Research Council (2015–2021). The coordinator of ORIENT is one of the consortium subproject PIs in ROSE. ORIENT and ROSE supported each other and brought synergies, but the work did not overlap.

In Germany, we collaborated with the national excellence cluster CITEC of University Bielefeld by attending CITEC workshops and developing national research proposals.

11.6 Added value of the International Consortium

Please describe the added value of working as an international consortium, compared to project partners each working separately at the national level. In what way and to what extent did the international cooperation in the project help to broaden your perspective on demographic change in Europe and beyond?

The consortium offered a multi-faceted view into the topical research theme. Finland, Sweden and Germany are different in terms of scale and characteristics of robot use, and there are differences in the societal structures and welfare systems, yet there are many challenges in common. For instance, Sweden adopted a strategy on robotics and automation already earlier, whereas Finland adopted its first strategy for robots and wellbeing in 2018, when ORIENT had already started. Germany, again, is robotised particularly within the industry. Ageing characterises all, Finland being the most rapidly ageing. Individual impacts of ageing, again, do not depend on the nationality, but are universal. The welfare systems have somewhat different histories and are on different development paths. Urbanisation affects all, but with different speed. Finland and Sweden are characterised by long distances and have traditionally held up the infrastructure in remote places, while Germany faces this challenge now in health care. Transportation/ driving time to customers' homes increases in less urbanised regions and the costs for care arise. Along with increasing urbanisation, this is a challenge for rural areas in all the three countries. Cultural attitudes are also at the core of transnational research; attitudes differ across countries as far as the concept of robots and robots' tasks are concerned. All these issues characterised the collaboration in ORIENT, and the international perspectives were highly interesting. Our comparative results have also been published as part of the project's research outputs. The demographic changes do not take place in one country in a vacuum, so we need to increase international understanding, as was done in ORIENT.

The differences and similarities within the compact consortium – in the countries and disciplines – enabled recognising 'one solution fits all' type of solutions as well as spots where tailored solutions

are necessary. In this early phase of robotisation in care, transnational collaboration also enabled early benchmarking and thus hopefully more effective practices for the benefit of older people. In addition to the scientific viewpoints, the consortium partners had different kinds of existing networks (for example; Germany: insurance and robot companies; Sweden: municipal partners and robot developers; Finland: NGOs representing older people, care providers, trade unions) that were and will be utilised in the research and dissemination of the results even beyond the project. Traditions in how to work with stakeholders also vary across countries, which further enriched collaboration and mutual learning.

Last but not least, a major source of added value that needs to be mentioned once more was the interdisciplinarity of the consortium. ORIENT benefited greatly from the researchers representing different scientific disciplines; innovation research, welfare technology, caring science, social work, co-creation of services, human-machine interaction, organizational science, educational science, and interactive technology. This clearly strengthened the project's outcomes and the potential for gaining wide and deep knowledge and insights into care robot orientation.

12 What can we do for you?

12.1 What can we do for you?

What can we do to help you to amplify your message? How can we help you to connect to the right people/stakeholders (e.g. to share your research results)? How can we help you to add value to your results?

The JPI MYBL website could have been improved so that it would have been easier to find up-to-date information on the projects. Information on future opportunities within JPI MYBL and other similar programmes could have been made easier to find, too. Some additional meetings with other MYBL projects could have been organised, for instance, online meetings, in addition to the face-to-face ones. One idea would also be a joint basic communication strategy for the projects; that could have helped us all in connecting and sharing results.

12.2 Feedback for JPI MYBL

Please provide any feedback arising from this project so we can improve our procedure for any future joint calls.

The secretariat could support the projects' visibility through its channels. Collaboration between the projects could be advanced. Liaison persons should be appointed already when the projects start and follow similar practices in their task. It should be taken into account (in practical issues) that all projects may not last equally long.

JPI MYBL has provided an interesting new arena for our research. We are grateful for this opportunity, and hope that it would be possible to maintain the contact somehow.