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## From assistive and care robots to new technologies to aid older people to ‘navigate’ the world, work, stay healthy and prevent isolation

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Technologies will be developed as part of research projects funded by the European JPI More Year, Better Lives. Seven projects were awarded funding under the III call of the JPI, “Ageing and Place in a digitising world”, dedicated to elderly people and new technologies; the main aims of the projects are to help older people to stay connected, to participate in society and work world, and to help combat loneliness and isolation that hurt elderly health.

From robots for assistance and care, to software and technologies to help older people to remain active and interact with the rest of society, to applications to help people with mental decline or dementia: a kaleidoscope of new technologies that are now conceivable to help elderly people and protect them from isolation and that will be more and more used in the next future. These technologies will be developed by international teams of researchers as part of new research projects organised by the JPI More Year Better Lives.

Seven projects have been awarded funding under the “Ageing and Place in a digitising world” call, which focused on three research topics: i) technology, that is how implementation of technologies can enhance older peoples' ability to contribute to society; ii) place, how individuals experience the places where they live, work and engage with others; and iii) learning, how learning programmes can enhance health and wellbeing of elderly people. The projects will be supported by 14 Funding Agencies from ten different countries at a total cost of 6.124.985 €. Technologies will be based on real needs of older people, who will be surveyed about specific themes including eHealth, difficulties with technologies at work, and living autonomously at home as long as possible.

Supporting digital literacy and appropriation of ICT by older people - ACCESS

Combines expertise from five participating countries: Austria, Finland, Germany, Italy, Japan.

Coordinator: Prof. Claudia Muller, University of Siegen, Germany

ACCESS is dedicated to digital literacy; it provides socially embedded learning opportunities for older persons with low technical skills in order to enable them to get in touch with modern technology and find meaningful ways for its every-day use. By doing this, the project aims to overcome a general lack of attention to later life learning, which is at stake in many countries. This is all the more important as a multitude of digital media and new technologies now exist to support older persons' wellbeing and enrich their every-day lives. However, seniors face many obstacles and hindrances when taking up these modern technologies. ACCESS puts a focus on learning processes as one solution to tackle these challenges.

We will examine different local settings of formal learning (such as adapted internet courses), as well as informal and non-formal learning opportunities (such as community-based get-togethers, seniors learning together with and from other seniors, inter-generational interactions).

Each partner will bring a genuine expertise and focus in the project, so that learning will be examined from a holistic perspective. The main research objectives are: the creation of learning offers which also reach out to the hard to reach older persons; the generation of learning programmes which foster health literacy; the examination of innovative learning and experience exchange models to be applied to different social contexts. Through the development of a mobile demonstration kit consisting of different devices, we aim at opening up discussion and experience exchange about state-of-the-art technologies among older adults, but also among other stakeholders who are involved in supporting and counseling the elderly in their daily living.

The overall project aim is the development of strategies for supporting learning in the local environment. Measures and recommendations for future policy and practices around the uptake of internet applications and new technologies to foster wellbeing will be developed in order to spark a new learning culture for older adults.

Technology to support decision making about ageing at home - Coordinates

Combines expertise from three participating countries: Canada, Sweden, The Netherlands.

Coordinator: Prof. France Legare, University Laval, Canada

The project focuses on older adults with early-stage dementia living at home. Informed by work by Mirjam Marjolein Garvelink, a post-doctoral student from the Netherlands with the Canada Research Chair in Shared Decision Making and Knowledge Translation since 2014, we will study how older adults with dementia move around in their environment (inside and outside their homes), and how insight in their movements may improve decision-making about staying independent at home. We will also assess their experiences with using technologies such as the TakeCare platform, and GPS tracking. “TakeCare” is an online platform (app on phone, tablet, or computer) developed by Greybox (<http://www.greybox.ca/>) whereby data (e.g., blood pressure, heart rate and recovery, weight, glycaemia, and activity level including step count, cadence, posture, acceleration and compliance to exercise programs) is collected through different connected devices (e.g., tensiometer, balance, glucometer, stress manager, and an insole to track, measure and analyse gait).

The project will adopt an integrated knowledge translation approach, meaning that end users (including ‘patients’) will be involved throughout the project, and in different roles (both as partners and as research participants). In Phase 1 we will include 20 older adults and caregivers per country, in phase 2 we will include three groups of 5-8 end-users per country (including older adults, health professionals and policy makers), and in phase 3 we will include a total of 216 older adults and caregivers; 20 people that participated in phase 1, and 196 newly recruited people. We will be able to rely upon the experience of experts in this area from the SPOR SUPPORT unit of the Province of Québec; this unit is dedicated to patient oriented research and our research center in Québec city hosts a component of this unit.

Together with end-users (older adults, caregivers, health professionals, policy makers, technology partners), we will study how the technology could best enable self-management in older adults in three countries and thus inform all those involved in the shared decision making processes about housing options.

Our hypothesis is that new wearable technologies that generate data (e.g., step counts, cardiac and respiratory activity) could serve to provide feedback and valuable information to older adults on their health and level of activity; this in turn will help keep older adults independent at home for longer, and have the potential to inform and influence their housing decisions in a unique way. We will use existing tools and technology, and we will assess how they should be adapted to better address the needs of our end-users.

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

Combines expertise from three participating countries: Finland, Germany, Sweden.

Coordinator: Prof. Helinä Melkas, Lappeenranta University of Technology, Finland

Orient is focused on the theme of care robot technology and service innovations. The use of care robots is beginning in real life, in different tasks, but it is still in its early days. The situation also varies across countries. There are robots for various tasks and environments, for instance, for rehabilitation and prostheses; for personal physical assistance (e.g., mobility), and for personal cognitive and social assistance (such as support for self-care, e.g., motivation to exercise; companion robots; support for interaction, e.g., telepresence).

In the ORIENT project, new methods and models will be developed for orientation into care robot use - taking into account the needs of older customers and their relatives as a first priority.

Various obstacles to care robot acceptance have been identified. In this project, we will focus on: how robots should be introduced in care; what should be taken into account when planning their use; what kind of training, support and information the various parties (older customers, relatives, caregivers, care service organizations, etc.) need, and in what ways these can be taken care of in daily services. ORIENT will contribute to: taking into account the needs of older customers; user-friendly use of care robots; overcoming pitfalls in their use for older people's wellbeing; and obtain benefits from new opportunities provided by care robots.

Dementia or mild cognitive impairment: @work in progress - MCI@work

Combines expertise from three participating countries: Sweden, Canada, and Finland. Coordinator: Prof. Louise Nygård, Karolinska Institutet

The project is focused on persons with mild cognitive impairment (MCI) or early stage dementia, with the aim to develop new knowledge and tools to facilitate continued work and/or transition from work. Many disciplines will work together: occupational therapy, psychology, engineering, jurisprudence and political science.

MCI@work will support the co-design and co-creation of new digital tools to support people with MCI at work through an understanding of aspects like the role of technologies, laws, and policies, and how they affect people with MCI.

Based upon the trends (growing aging population resulting in a need to stay productive for longer time, retirement age recommended to be raised in many countries, better pharmacological treatment for early cognitive decline, etc.) we can expect the numbers of people with MCI or early dementia still at work in Europe to rise.

The empirical project will include case studies and the joint compilation of information gathered from the case studies from different countries. This will provide an in-depth understanding of how the situation and transition process of people with MCI might be experienced and managed, and of the influencing conditions, particularly related to the role of technology. Technology might be a hindrance as well as an asset in different cases, that is; technology might not be the solution for all. Development and evaluation of new tools will be included in cases. Based on knowledge generated in these longitudinal case studies, we will co-create a new computer-based tool to support the person in the transition from work, for example by supporting communication, education, and adapted occupation. We will also investigate how laws, regulations and policies in different countries and organizations can support and/or hinder continued work and/or transition from work, how these are practiced and how they can be understood better by people with dementia/MCI and their employers.

The project will produce innovations that will be further tested and developed in different contexts: a new ICT-tool to support persons with MCI or early stage dementia and their employer to deal with issues that raise in the work situation and/or the transition process out of work; new tools and methods to evaluate and support people's self-initiated approaches to finding solutions and to learning and problem solving, particularly related to technology; Detailed compilations of data based upon the case studies will shed new light on the topic and provide a base from which other innovations can be developed.

eHealth and Ageing in Rural Areas: Transforming Everyday Life, Digital Competences, and Technology - HARVEST

Combines expertise from three participating countries: Finland, Italy, Sweden. Coordinator: Prof. Simon Lindgren, Umeå University, Sweden

The HARVEST project is particularly focused on how eHealth services are targeted to, and used by, the elderly, with a particular focus on sparsely populated areas (rural and mountains areas).

Harvest aims to study the role of the Internet, computers, smartphones and tablets in the daily lives of elderly people living in rural or mountain settings. In particular, it can be considered that digital technologies for health (eHealth) and the impact of these technologies in the life of the elderly are geographically "isolated".

The research includes a series of home interviews in three countries: Finland, Italy, Sweden.

In particular, the project is dedicated to studying elderly subjective experiences of eHealth services like "virtual health rooms", virtual health and social service centres, digital care applications (for example online discussion forums about health issues, and websites or smartphone applications for getting in contact with doctors) so that future services may hopefully be improved.

We will study subjective experiences, through interviews, as well as ideological dimensions, through policy analysis. In addition, we will also focus on the technology itself in the form of apps and other online services. This will give a broad and deep understanding, and we hope that the results will work as a starting point for those developing future platforms.

Being Connected at Home - Making use of digital devices in later life - BCONNECT@HOME

Combines expertise from four participating countries: Canada, Spain, Sweden, The Netherlands.

Coordinator: Prof. Eugène Loos, Utrecht University, The Netherlands

BCONNECT@HOME is dedicated to finding new ways to help older people to stay connected by the use of technologies. This will enable them to fight loneliness and social isolation that put their health and well-being at risk, and to enhance social inclusion. This project studies how older people use digital devices in their everyday life (e.g., to collect and share information, to share emotions, to have fun together) in order to enhance their social well-being. The older that people grow, the more diverse they become as a group, which is called aged-heterogeneity. The unexpected and creative use of devices by older people, as a diverse group, will be an important focus.

The research is organised around four Work Packages (WPs): WP1- 'Tracking older people's mobile use' focuses on a specific digital technology, the smartphone. We will conduct one-month tracking of a sample of 150 older individuals in the Netherlands, Spain, Sweden and Canada. Tracked data includes apps used, web pages visited, time of use and length of the activity. WP2 'Digital lives of older people' explores how the use of digital devices has consequences for the way that older people inhabit and create a sense of place and belonging, and how places impact the way these technologies are used. WP3 'Digital infrastructures of health and ageing' explores the ways that expertise about ageing and health is both produced and reproduced as it circulates through them. WP4 'Academic Work Places for the digital life course', will see older people, designers, policy makers and researchers meet, to ensure the development of participative methods for the implementation of technologies in older people's home.

Privacy-Aware and Acceptable Lifelogging services for older and frail people PAAL

Combines expertise from five participating countries: Canada, Germany, Italy, Spain, Sweden.

Coordinator: Dr. Francisco Florez-Revuelta, Universidad de Alicante, Spain

Lifelogging technologies (also known as quantified self or self-tracking) - e.g. wearable cameras and smart watches, wristbands and glasses - may enable and motivate individuals to pervasively capture data about themselves, their environment, and the people with whom they interact.

Recent advances in wearable computing are supporting the adoption of healthcare and assisted living services by a larger population, with a myriad of products in the market, increased functionality of mobile devices and apps for health and wellbeing, and easier installation of cheaper home automation systems. These devices allow the acquisition and processing of physiological signals (e.g., heart rate, respiratory rate, body temperature, and skin conductance), motion, location, performed activities, images seen, and sounds heard. Lifelogging using these technologies is the basis for the provision of a variety of cutting-edge services to increase people's health, wellbeing, and independence. Examples of these services include: personalised healthcare, wellness monitoring (e.g., physical activity, dietary habits), support for people with memory impairments, social participation, mobility, support to formal and informal caregivers, and predictive systems (e.g., decline in cognition, aggressive behaviours, fall prevention).

The main objectives of PAAL are to increase the awareness of the ethical, legal, social, and privacy issues associated with lifelogging technologies; and to propose privacy-aware lifelogging services for older people, evaluating acceptability issues and barriers to familiarity with technology, to elaborate on possible strategies for overcoming them, promoting the use of technologies of all kinds.

There are several target applications: prompting and reminding systems, using computer vision and environmental sensors to monitor the actions of an older adult with dementia during common activities of daily living, and to provide automated reminders of the steps and tasks that need to be completed; frailty monitoring and fall prediction, uses computer vision, environmental sensors, and wearable devices to determine if an older adult is becoming more frail based on monitoring their activities and movements both within the home and outside; recognition of activities of daily living using wearable cameras, cameras located in the environment, and sensors embedded in mobile phones and smart wristbands; and support of people with dementia and their caregivers using environmental sensors at home for behavioural analysis.

<http://www.jp-demographic.eu/>

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#### Notes for editors:

please for interviews with each project's leader contact Rossana Moroni who will give you the contacts you need.

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<http://www.jp-demographic.eu/news/jpi-mybl-2018-brussels-conference/>