

DOREMI orchestrates active and healthy ageing



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DOREMI conference's participants, 25 October 2016

The final word of the DOREMI project

The decline of cognitive ability is strongly related to lifestyle, resulting from the interaction between social engagement, cognitive stimulation, nutrition and physical activity. The 7FP European-funded DOREMI project (**D**ecline of **c**ognitive decline, **m**alnut**R**ition and **s**ed**E**ntariness by elderly empowerment in lifestyle **M**anagement and social **I**nclusion) showed that cognitive decline can be counteracted and social inclusion can be improved with the help of cognitive games, nutritional support and physical activity.

The [project final conference](#), which took place at Regione Toscana Office in Brussels on 25 October 2016, was the occasion to showcase the integration of practical measures, developed by DOREMI, against malnutrition, sedentariness, and cognitive decline.



Prof. Parodi presented the overview of DOREMI project and results

Food intake measurements, personalized metabolic control, and exer-games associated to social interaction stimulation, and cognitive training programs were proposed to a selected group of seniors in pilot trials in Italy (older people's homes) and in the UK (residences). The project combined multidisciplinary research in serious games, social networking, Wireless Sensor Network, activity recognition and contextualization, and behavioral pattern analysis. By recording and monitoring information about the use of the adopted lifestyle protocols, it was possible to track the user performance over long periods, providing a potential alert for signs of malnutrition, physical and cognitive deterioration. The close collaboration between the healthcare representatives and experienced technological partners drove the ICT development needed to release a set of prototypes to be validated in the pilot study.

Fifty people among health & social care professionals, care providers, policy makers, researchers, IoT industries and companies developing solution for Nutrition participated at DOREMI Conference, that raised great interest for project results and products, focusing in particular their questions on future applications for improving quality life and health in older people. Great appreciation generated in audience the talk of a DOREMI user from EXTRACARE Shenley Wood Village in Milton Keynes (UK), invited to describe his experience during trial.

Finally, the DOREMI Project Officer, Dr. Horst Krämer, invited speaker, presented the future European strategies to mobilize stakeholders in digital technologies for Active and Healthy Ageing and support Silver Economy development.

The DOREMI system is made up by:

- a smart balance in the form of a Wii-based balance board for daily weight measure and balance assessment, helpful to detect the risk of falls;
- an Android tablet containing all DOREMI apps: the Exergame (a virtual support for daily physical activity to perform in-house regular activity according to international guidelines); the cognitive app (a series of games to support several areas of cognitive function); finally, the METADIETA dietary app developed in the DOREMI project for English users. Thanks to a visual approach the user can fill in a personal food diary, selecting food types and portions through the images. Medical doctors will remotely check the diary and, if necessary, modify participant's diet to promote healthy nutrition according to the general guidelines promoted by DOREMI.
- a bracelet collecting the heart bit rate, calculating the kilo-calories consumption, counting steps and providing outdoor localization. When the user is at home, the bracelet sends its data directly to the DOREMI station, installed in the apartment; when outside, data produced by the bracelet are sent to the user's smart phone, which stores them and send them to the DOREMI station when the user goes back home;
- environmental sensors, installed in each of the selected apartments to check the habits of the user and his level of socialization. These sensors (about 10 per apartment, but the number depending on the dimension of the apartment) were integrated with the bracelet, in the sense that the system is sure to collect data relevant the DOREMI user only, i.e the person wearing the bracelet.

The data produced were integrated with all the other data collected and represented on a dashboard to be analysed by physicians. Everything in DOREMI is some way connected: user's habits, exer-games and serious games aggregate their information in order to provide a view on the user as much comprehensive as possible.

The full DOREMI solutions are ready to be used, including those products addressed to specialists, such as the storage server, data post-processing and the web server for the dashboard (one server in each apartments, also called DOREMI station).

The trials and their results

After 2 years and half, DOREMI products started to orchestrate active ageing with a first round of trials. 32 older people (age 65-80 years) were involved in the trials that lasted 3 months. The participants were characterized at baseline in terms of physical activity (SPPB, PASE test, daily steps/meters, 6MWT), hemodynamic and biochemical parameters (blood pressure, HR, lipid profile, glycaemia, etc.), dietary habits (caloric intake) and balance assessment (BERG scale). Through the DOREMI technological platform, users were stimulated to perform indoor physical activity protocol (exergame on tablet); monitored by DOREMI bracelet (heart rate monitoring); invited to fill diet e-diary, receiving nutritional advice provided by the expert through the same application; tested for balance (DOREMI smart balance board). At the end of trial, users underwent the same test battery of baseline. Users reported to be satisfied with the solutions, and even to enjoy having them in their lives, to the point they missed them once the trial was over. One positive and unexpected result was a greater socialization among the participants, who bound together and are still hanging around together also after the trial closed. Also the response of care providers has been very

positive, as they can utilize the DOREMI system through the dashboard created for them in order to follow in the time the lifestyle of their patients.



DOREMI testers on a DOREMI game on tablets

For a clear overview of the users' experience, the own words of one resident in the UK, Mr. Jack Piggott, are very useful to sum up the challenges and outcomes of the DOREMI trials. Listen to him presenting his experience at the final conference in Brussels [here](#).

Mr. Piggott highlighted that at the very first he was not entirely enthusiastic about the installations required (he mentioned he feared the 'Big Brother' effect and the intrusiveness of some equipment). Nevertheless he volunteered, he underwent thorough medical tests, he followed the instructions and challenged himself according to the protocol. As established resident in his village, he already has *"friendship circles, but we enjoyed reaching out to other residents: they greet to each other, swapped experience, laughed, complained and offered advice"*. From his own experience, he said to see the potential of the DOREMI in enriching the life of older people, especially for those not so privileged to live in good establish villages. He was also pleased to contribute to the project: *"DOREMI brought the outside world in my apartment: may it do the same and more to many more people!"*

DOREMI in the European frame

The European Commission is organizing the European Summit on Digital Innovation for Active and Healthy Ageing on 6-8 December 2016, building on the achievements of the European Innovation Partnership on Active and Healthy ageing (EIP-AHA), past and current research & innovation projects, the Active and Assisted Living Joint Programme with Member States and the EIT-KIC on healthy living and active ageing. The Summit intends to mobilise the relevant stakeholders around a common vision for scaling up innovation in Health and Active Ageing, the agenda for jobs and growth, strengthening the co-creation across national and regional authorities, civil society, and industry on creating scalable market opportunities within Europe and Globally. In particular high growth-potential areas such as ICT supported independent living and age-friendly smart homes, social robotics, digitally supported integrated health and social care services will be targeted. DOREMI and its solutions have been invited to showcase how they overcome the challenges and delivered well-being to seniors.

For more information, the Summit website: <http://ec.europa.eu/research/conferences/2016/aha-summit/index.cfm>, still open to registrations.

The DOREMI website and the overview of its products: <http://www.doremi-fp7.eu/news>

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