Innovative solutions and environments to support Active and Healthy Ageing

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***Abstract*— R&D projects in the eHealth area, since the last 10 years, have been seeking to provide more meaningful and relevant answers to the current challenges of modern societies. Starting from personal health systems sector, it will be shown how technologies and innovations have evolved from projects were the aim was to create a communication and management loop between patients and professionals for a specific disease, to solutions that anticipate the occurrence of undesired health problems for people with multiple conditions, trying to keep people active, healthy and socially useful in their living environments.**

I. Introduction

Longer lives represent an outstanding result of our modern society. However, if additional years are not associated with good level of cognitive and physical status, this achievement may imply a counter-productive effect: health and social care systems have started to re-orient the delivery of services with preventative approaches and actions. In this context, research and innovation actions have evolved in the last 10 years. This paper gives an overview of relevant projects funded by the European Commission (EC) in the area of Personal Health Systems [1.], Virtual Physiological Human [2.], and Active and Healthy Ageing, [3.].

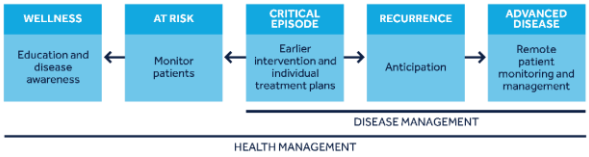

Figure 1 - Shift from a Disease Management to a Health Management Approach and the tole of ehealth solutions

II. Personal Health Systems

In the 2005-2012 period, the EC has funded projects like Hearthcycle (FP7-216695), to define, develop and tests IT-based solutions to improve the management of Hearth Failure and Coronary Hearth Diseases. In the METABO project (FP7-216270), the target population was type 1 and type 2 Diabetes Mellitus, and Parkinson Disease in the case of the PERFORM project (FP7-215952). In all these projects the main goal was to identify the relevant parameters that sensors and devices had to collect to support the management of the disease and on how these parameters could be shown to patient and to care professionals. This projects demonstrated good results in terms of usability and acceptability of solutions and on the possibility of individualize clinical pathways according to population' segments.

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Patient Empowerment and Preventative Treatments

During the years 2012-2015, the EC funded projects in the area of self-management and prevention. In the MOSAIC project (FP7-600914), the aim was to use data mining techniques and predictive models to develop decision support systems that allow professionals to take better decisions when risk stratifying type 2 diabetes. This decisions may involve one or more healthcare institutions, thus the challenge is to establish strategic communications among them. In the PD-Manager project (H2020-643706) PD patients are empowered, through eHealth solutions, in the management of their condition through wearable devices, integrated care and comorbidities' prevention.

Personalized Medicine, Unobtrusive Monitoring and Smart Living Environments for Ageing Well

Since 2016, projects like Big Data to Decide (H2020-689715) are focused on exploiting the availability of big (but yet fragmented) amount of information to improve the prognostic decision for Head & Neck Cancer. Similarly, the information that a city is continuously producing is being used to unobtrusively detect behaviours and early symptoms of frailty and cognitive decline of older adults in the City4Age project (H2020-689731). Finally the ACTIVAGE project (H2020-732679) is showing that the Internet of Thing paradigm will be essential to deploy solutions for people to live longer, healthier and happier in their living environments. It is also worth to notice that testing environments have also evolved from labs and test-beds to living labs and ecosystems.

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