The Madrid Deployment Site of the ACTIVAGE Large Scale Pilot

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Abstract— **ACTIVAGE is a Large Scale Pilot that aims at demonstrating that IoT solutions are key enablers for the successful deployment of Smart Living solutions that positively impact active and healthy ageing. This pilot is going to be executed in different centers in Europe, referred as Deployment Sites (DS). Among these ones, the Madrid DS will test IoT services for early detection and prevention of cognitive performance decrease and also on the falling risk of elderly individuals, enhancing innovation and sustainability in the social care system.**

I. THE MADRID DS DESCRIPTION

The Madrid DS will provide a non – intrusive monitoring of activities of daily living (ADLs) in the living environment of older adults. The living environments will be places where individuals has an active interaction along the day such as their homes, public transportation, day–care centers, etc. This concept is possible thanks to an IoT infrastructure that transforms the living environment in a smart living environment and a strict collaboration between service suppliers and demander in both public and private sectors. The benefits for the older adults are related to the increase of the independence in their living environments thanks to personalized and ad hoc interventions that depend on a specific combination of social interaction and daily activity.

More specifically, the Madrid DS aims 1) to prevent the decrease of the cognitive performance by personal brain training and reminders, 2) to prevent the falling by physical training and exercises and 3) to prevent the social isolation by encouraging users to establish and maintain active social interactions through mobile applications.

The monitoring scenario of an individual´s living environment, which includes homes, day care centers, the public transportation and other points of interests. The Madrid DS will measure users' personal activeness, postural assessment and social loneliness. As result of examining closely these parameters, interventions, corresponding to each one of the needs of the individuals will be suggested. More particularly, interventions will include 1) momentary interventions such as promotion of healthy habits or suggestion of social events, to prevent the decline, 2) adaptive & dynamic interventions such as risk detection through training (memory exercises, balance training, etc.) and 3) just in time interventions such as emergency calls, to support the individual in due course and in combination with the adaptive interventions. Accordingly, Madrid DS will propose new innovative services combining existing technologies together with available public infrastructure leading to an IoT scalable solution able to be adapted to the demands of the interested users. Madrid DS is also expected to cover both private and public sector. Madrid DS pilot aims to operate with up to 1000 eligible individuals who meet some certain criteria: non – dependent elderly people, without severe health conditions, users coming from both private and public sector (50% - 50%), and users who are available for a 12-month timeframe observation. In terms of technology and information generated, the following main components have been selected from previous research projects:

- *Daily Function Assistant* (DFA): Using NFC tags (also known as Smart Cards), the DFA enables the user quick access to common functions of their ambient, and communication needs.
- *EMT*: Using the embedded wifi, and services in the buses and bus network of the city of Madrid, this application is capable of tracking the user's movement and help them get to their destination.
- *TEA Activa*: this application helps the users manage their health, by connecting different health sensors and providing cognitive exercises as well as easing social interaction. The information is shared with health specialists who can intervene if there are abnormal readings.
- *Equimetrix*: it is an application used to asses and train the balance of the user. It is composed of a sensor and an application.
- *Domotic*: it grants the possibility for the user to control their ambient, as well as context awareness to the whole system, using any of the domotic protocols and devices.
- *Wristband*: it tracks the physical activity of the user, sleep cycle, as well as their heart rate.
- *Monitoring Detection & Intervention*: it gathers all the information the IoT devices and applications are generating with regards to the user, and through some rule-based processing, detects potential risks the user might be in. In the case there is a risk this system is also capable of intervening by either sending direct messages to the user or through other services like personal nurse calls.