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WHAT IS PHYSIODOM-HDIM?

PhysioDom-HDIM is an innovative ICT solution that enhances living conditions for senior citizens, as well as improving the efficiency and integration of health and social care systems. The PhysioDom-HDIM system has been developed based on a small French pilot, the Reseau Vercors Sante project (RVS), which successfully trialed the system in 50 homes and engaged with 70 health and social care professionals. The pilot was run over a two year period and delivered positive results and acceptance by its users. It now needs to be validated on a larger scale as part of an e-Health approach that involves all of the players - from institutions to end-users at home ***… this is a big challenge!***

More and more research confirms the central role an adequate diet and a reasonable level of physical exercise contributes to good health and wellbeing. To address this issue, a new key component will be added to the PhysioDom system - a lifestyle coaching system called **Home Dietary Intake Monitoring (HDIM)**. This system will recommend personalised dietary and physical exercise levels based on individual's needs and monitor users' compliance with these recommendations.

The system will use an observational approach and analysis of daily living to monitor weight, lean/fat ratio and physical activity. The project end users will be seniors citizens (aged >65) who are active, in a state of pre-frailty or frail health, dependent and/or have chronic illnesses, such as heart failure, diabetes, high blood pressure, or receiving chemotherapy treatment.

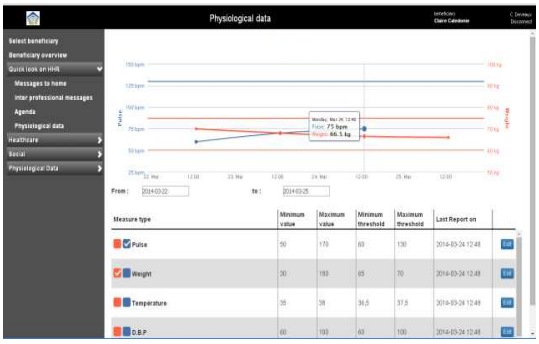

Figure 1: Physiological Data for end-user

The PhysioDom-HDIM project consists of three fundamental components:

- A TV monitor used as a terminal for home healthcare.
- The PhysioDom system used as a means of developing digital healthcare access in a given area.
- The HDIM service adapted to the needs of individual users, regardless of their physiological or health status.

The system will use home TVs as a 'terminal' to display and access information from the user's individual Home Healthcare Record. The TV is connected to a set-top box and linked to a wireless body composition monitor connected scale (BCMCS*) and a wireless pedometer; as well as other medical sensors wireless blood pressure monitor, glucometer, if needed. These sensors will transmit user's data live using the set-top box.

Figure 2: Hardware Infrastructure of the system

This data will be monitored against parameters and data specific to the HDIM service - weight, body mass index, FM ratio, distance covered, appetite measurement, dietary monitoring, as well as physiological parameters - blood pressure and blood sugar. The system will notify carers if a person's condition has changed

* Besides its primary weighing function, the BCMCS also uses four sensors to carry out bioelectric impedance analysis, which measures in ‹10 seconds the body fat and free fat masses of the user, which will be compared against the user's pre-configured profile (age, gender, height).

The on screen Home Healthcare Record (HHR) system will include the following functions:

- Home dietary intake monitoring (HDIM).
- Personal agenda management.
- Remote monitoring by either formal or informal carers of the delivery of homecare services.
- Remote messaging system from homecare services or informal carers to the end user.
- A central remote back office, which will be responsible for data management.
- A web portal for health professionals, allowing them access to users' health data records (HDR).

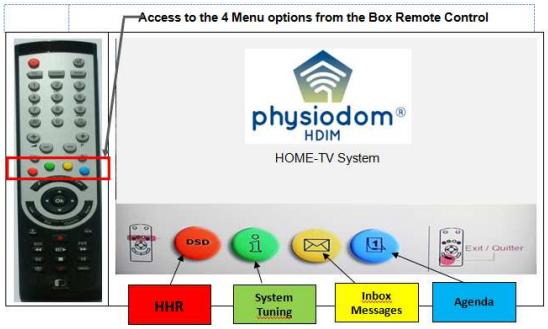

Figure 3: Prototype of HHR TV user menu interface

What are the Project Challenges?

The main challenges of the project are:

- To develop and improve the current technical platform.
- To deploy the PhysioDom System in 750 homes and with 150 healthcare professionals, across 3 UE Pilot Sites.
- To train users and professionals to use the system.
- To manage the changes in the organisations supporting the system.
- To evaluate the performance of the HDIM system, including the technical and practical use of the service.
- To establish a business model for how it could be rolled out on a bigger scale across the EU.

What are the Project Objectives?

The expected objectives of the project are:

- It is adopted and used by the senior citizens and health and social care services (acceptability).
- It adds a major enhancement in terms of perceived quality of life (efficacy).
- It proves to be effective in terms of preventing frailty and its complications (efficacy).
- It improves the management of simultaneously occurring long term conditions - heart failure, diabetes, high blood pressure (efficacy).
- It can be implemented at a level that is affordable by health and social care providers (efficiency).

For information about the Physio-Dom HDIM project, contact:

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The PhysioDom-HDIM project has received funding from the European Union's ICT Policy Support Programme as part of the Competitiveness and Innovation Framework Programme.

PROJECT PILOT SITES

The project will implement a large scale pilot of the PhysioDom-HDIM system in three different European countries:

- Spain
- The Netherlands
- The United Kingdom

Each of the countries has different organisational set-ups, but the same dietary intake monitoring will apply to everyone. Therefore, the 250 target population in each of the pilots should be part of a variable plan for integrated types of assistance, but one that includes dietary intake monitoring.

Spain

The pilot site in Spain is being lead by **The Consorci Sanitari de Terrassa** (CST), a public health consortium founded in 1989 with roots dating back to the 17th century. CST is also the **Project Coordinators**.

CST provides integrated healthcare services, in a range of acute and chronic diseases, to a population of around 200,000 for the city of Terrassa, located close to Barcelona.

CST facilities comprise of:

- 450 bed Hospital for acute diseases
- 2 Social Healthcare Centres
- 7 Primary Care Centres
- 2 Mental Health Centres
- Specialised High Performance Sports Medicine Healthcare Unit

One of CST's strategic focus areas for research and innovation is the improvement of health and social care provision for the elderly, in the framework of Active & Healthy Ageing, specifically in terms of quality of life and of efficiency.

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The Netherlands

The pilot site in the Netherlands is being led by **Wageningen University & Research Centre,** which specialises in academic education and research on life sciences and natural resources. The Human Nutrition Division of Wageningen University (WU) is one of the leading nutrition institutes in Europe, with a broad expertise and outstanding facilities for academic education and research in human nutrition. Thus WU has a special interest in the nutritional aspects of the project.

Implementation of the PhysioDom-HDIM project in the Netherlands will be done in collaboration with the Academic Collaborative Centre AGORA Consortium and the pilot site will be hosted by Zorggroep Noordwest Veluwe (ZNWV), a care organisation which provides a broad range of care, ranging from domestic care to nursing and palliative care.

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The United Kingdom

The pilot site in the UK is being lead by **Alston Healthcare, part of Cybermoor Services Ltd,** a social enterprise based in the North Pennines. Cybermoor was setup up 2002 to provide broadband and home computers to improve access to services and overcome isolation in their small rural community.

Cybermoor established Alston Healthcare in 2007 to develop telehealth and telemedicine services, working in partnership with the local hospital, medical practice and other health and social care providers. These services included a chronic obstructive pulmonary disease/heart failure telehealth project and video links between local hospitals to provide remote assessment of patients. They also work with other NGOs to recruit test users for projects and usability testing of systems.

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PROJECT TECHNOLOGY PARTNERS

Habitat & Santé based in Grenoble, France is the **UREN Project Initiator** and **Pilot Co-ordinator** for the project. The company was setup in 2003 to help design and implement information systems dedicated to health networks focused on home care services.

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Sirian Technologies SAS based in France is a **Technology Partner** in the project and will lead on the development of the set-top box technology for the system. The company was founded in 2001 and they have worked in partnership with Habitat & Sante since 2003, including working in 2008 on the French pilot project.

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Viveris Technologies SA based in France is the **Technology Leader** for the project and is responsible for the development of the technical platform and industrial exploitation of the resultant prototype. They have been working in network development and embedded systems for industry and R&D for nearly 20 years.

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Télécom Santé based in France is a **Technology Partner** and will build the web interface for professional end users of the system. The software company founded in 2011 is dedicated to the healthcare market and their main product is a web portal for use in hospitals and clinics.

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STMicroelectronics based in France is a **Technology Partner** in the project and will be responsible for the development of the health gateway board and software for the set-top box. They are world leaders in providing semi-conductor solutions across a range of business sectors and their products are found everywhere micro electronics make a positive and innovative contribution to people's life.

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The Nutritional Epidemiology Research Unit of the **Université de Paris (UREN)** is the **Research Leader** for the project responsible for validation of the HDIM service. The unit is 1 of 9 units at the Ile-de-France Centre for Research on Human Nutrition. Monitoring the dietary intake of senior citizens, specifically in their homes, is one of the focuses at the UREN. However, the difficulty of collecting data at homes and the reduced access to sources of advice have been major impediments during the various studies undertaken, which is what makes the PhysioDom-HDIM project of such interest to them.

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Meditecnologia SA (MedTec) is part of the Barcelona Medical Association and will **Lead the Project Evaluation.** MedTec develop and promote technological solutions and innovation in the healthcare sector that contribute to a positive impact on the wellbeing, ageing and health of today's society. They have extensive experience in the evaluation and adaptation of technological solutions to meet the needs of both patients and healthcare professionals.

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