



Recent developments in ambient assisted living allow increasing autonomy and self-confidence for older people concerned about their health. A light wearable device measures vital signs, detects falls and automatically raises an alert to their care centre in case of an emergency.

The concerned old person

Healthy elders reach a stage when they may become concerned about their own health. This mental state often leads them to start reducing their physical and social activities, which have an increasing negative effect on their well-being.

Addressing the negative effect chain

Based on medical and social research for these people, Caalyx is providing a solution to improve the elder's autonomy and self-confidence with positive reinforcement.

Service Description:

Health emergencies are detected by constant monitoring of the elder's health. Raised alerts ensure appropriate response including rescue since the geographic position is provided for this purpose.

The daily health agenda provided at home gives reminders to take medication and health measurements, to request answers to their health questionnaire or to hold the interview with his doctor.

The communication tools support video-calls with their relatives, their caretaker and their doctors

The elders know that the doctor is aware of their health state, that the caretaker is always on-line, that their privacy is respected and importantly that they can always and easily communicate with their caretaker or his relatives,.

The result is that elders are free to live their life at home or in the environment of their choice with increased confidence and autonomy.

System Description:

In the Caalyx system, some physical signs of the elder are constantly measured by a set of sensors packed into a Wearable Light Device. Other physical signs are measured to a personalised schedule by other sensors at home, where a Home System is available for the elder to know his/her health progress and health agenda and to communicate with their carers anytime. A Nintendo Wii controller enables operation with the Home System, whose user interface is displayed on the TV. The sensors have been specifically selected to detect the most relevant health conditions in the targeted elderly.



Wearable Light Device able to measure five vital signs and to detect falls while mobile. It is linked to a mobile phone that transmits measurements and alerts to the Caretaker Center.

Based on the data gathered by the Wearable Light Device, a smart phone is constantly searching for personalised health condition patterns, sending an alert in case any health condition is found. The alert thresholds and the health condition patterns have been specifically adapted to the elder population and can be further tuned to each individual by his

practitioner.

The alert, received at the Caretaker Site, allows further attention and assistance from a number of people including: relatives, physicians and emergency services, besides the caretaker who is always on-line.

Innovative Features:

- Five vital signs monitored while mobile: heart rate, respiratory rate, oxygen saturation, temperature, mobility and falls.
- Elder's privacy respected. Their geographic position is only reported when alerts happen.
- Constantly search for health conditions based on a combination of vital signs
- Alert thresholds can be individually customized

- A learning artificial intelligence module helps the caretaker to identify false alerts and to select the best candidate response to help the elder
- The system is built on a Service Oriented Architecture
- HL7 security framework implemented to ensure elder's privacy
- Mobility report shows four states: walking/sleeping, sitting, lying and standing
- Enhanced fall detection algorithm incorporated
- An integrated video-call communication tool is available for all those involved in caring for the elder: relatives, caretaker and the personal physician
- An intuitive Home System, operated via TV using a Nintendo Wii controller

System Validation:

The system has been tested and validated with end users in real life scenarios in two stages.

In the first stage the system was used in a protected environment: a nursing home; where the prototypes were easily monitored and the users were constantly looked after by professional nurses in order to support them in using the system.

In the second stage, the prototypes were used by the end users in their own homes. Such trials session are quite challenging for research prototypes, nonetheless they provided effective input and feedback, which have been collected by the designers and developers to improve the system.

Evaluation and Future:

The project was successfully concluded and evaluated by

independent experts who encouraged the Consortium to develop further its activity to make sure the application can reach the market. Thus, the activity continues in the project: **eCaalyx**: Enhanced Complete Ambient Assisted Living Experiment, supported by the Ambient Assisted Living Association.

Partners:

- Telefónica Investigación y Desarrollo SAU – ES
- Instituto de Engenharia de Sistemas e Computadores do Porto – PT
- COOSS Marche Onlus – IT
- Synkronix Ltd – UK
- University of Plymouth – UK
- University of Limerick – IE
- Corscience GmbH & Co KG – DE
- Hospital Comarcal Sant Antoni Abat – ES

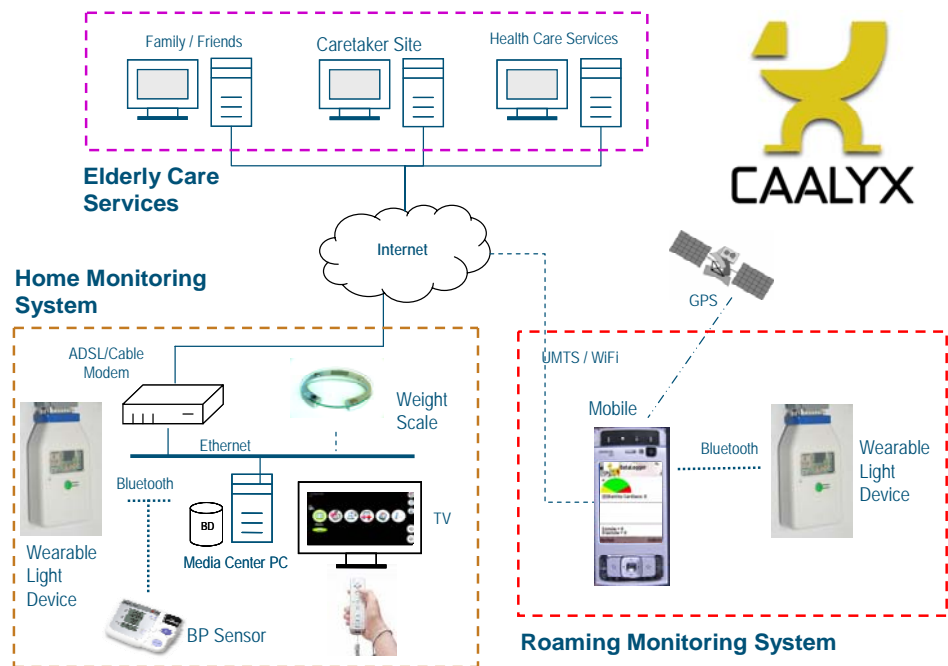
Timetable: from Jan. 2007 to Dec. 2008

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Caalyx' system architecture where three subsystems cooperate: the Roaming Monitoring System, the Home Monitoring System and the Elderly Care Centre.

Important Links:

Project website: <http://caalyx.eu>

Project publications: <http://caalyx.eu/>; menu item: publications

eHealth FP6 Projects: http://ec.europa.eu/information_society/activities/health/research/fp6projects

eCaalyx: <http://ecaalyx.org>

The Ambient Assisted Living Association: <http://www.aal-europe.eu>

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