

AAL Forum 2012 - Eindhoven

iWalkActive – The Active Walker for Active People

Title	iWalkActive – The Active Walker for Active People
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Affiliation	Hochschule Luzern - iHomeLab
Relevance	Presents the Call 4 AAL project “iWalkActive” in terms of end user needs, innovation contents, market aspects, concepts and user involvement



Active living is a way of life that integrates physical activity into daily routines. This is particularly important for older people, as regular exercise can increase both mobility and the potential for independent living. However, a large proportion of the age group 60-85 suffers from various kinds of physical disability that prevents them from living as actively as they would like to. Rollators and walkers have become very common mobility aids, as a means for walking support. In Sweden and Germany ~4% of the population uses a rollator.

One of the main problems with existing rollators and walkers is that they are heavily stigmatized. People in actual need of walking support often hesitate or refuse to use these walking aids, since they are seen as only for “old”, “sick” or “handicapped” people. Further, physical challenges arise outdoors, when the user needs to overcome physical obstacles or uneven ground with curbs, gravel, snow etc. Can a rollator become as accepted as a pair of Nordic Walking sticks today?

The aim of iWalkActive is to offer walking impaired people a highly innovative, attractive, open walker platform that greatly improves the user’s mobility in an enjoyable, motivating way, while at the same time enabling physical activities that are either impossible, or very difficult to perform with a traditional rollator.

Technically and conceptually, the idea goes beyond that of a conventional walking aid. iWalkActive creates an active walker for active people. It takes an innovative walker frame – the Veloped - extends it with an efficient, powerful e-drive and combines it with the possibilities of state of the art ICT technology acting as a mobile device dock connected to valuable assistance services.



Figure 1: Active Walker

The most important resource for the whole Consortium is the users involved in the project. They build the basis for solutions which will be used and truly accepted in the future. The different user groups active in different stages of iWalkActive, an SME directly working

with their customers and the focus groups organised by the iHomeLab, provide a solid basis to achieve the project goals.

iWalkActive is focusing on active adult people between 55 and 75 years who live independently and love to spend their time outdoors. The project will involve several user groups. The different user groups have been selected to cover the whole range of possible iWalkActive users. They were characterised in terms of their activity and mobility as well as the environment in which they live.

The active walker will be thoroughly tested by four different user groups in three European Countries (AT, CH, SE) in both urban areas and the outdoors and could hit the market within 2 years after the project ends. The aim is to bring benefit to both end users and society, in the form of improved health and higher quality of life of the individual, together with long-term reductions in healthcare and socio-economic costs. Figure above presents the 4 groups which will be directly included in iWalkActive.

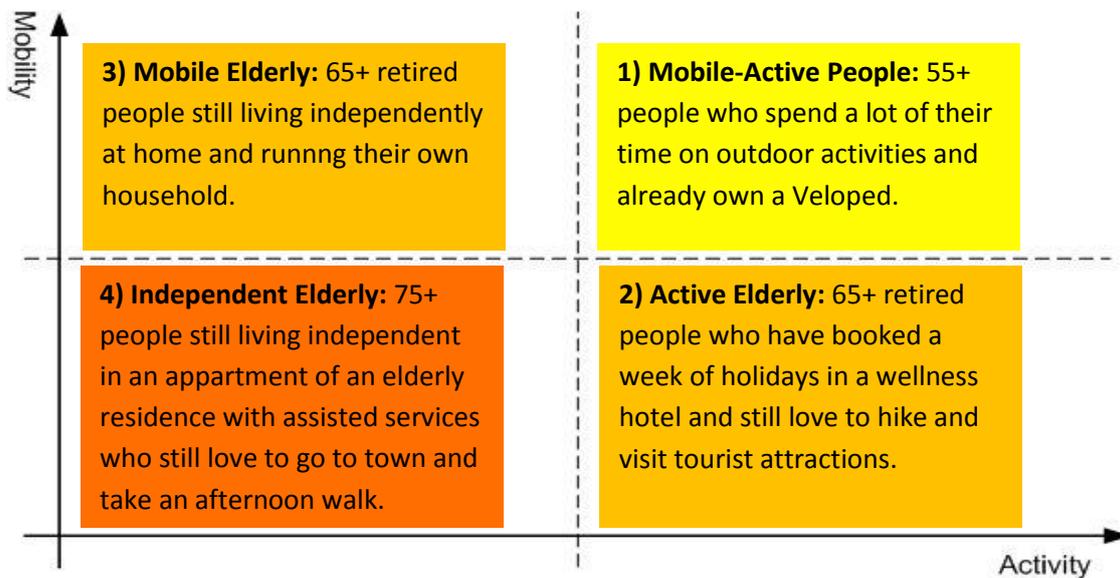


Figure 2: User groups

The iWalkActive activity platform offers outdoor as well as indoor navigation and orientation services and the assisting features of an all-terrain capable walker with a supportive e-drive. Community services such as the recording and rating of walking routes and an open interface for new walking-tailored Apps down-loadable over an AppStore based on the UniversAAL uStore, enable the users to enjoy improved mobility, greater access to the outdoors and better possibilities to stay physically active.



Figure 3: Outdoor walking

An ICT supported walker is a novelty and does not exist on the market today. Also the focus on active elderly walking outdoors is new. Specifically, taking the state of the art, the iWalkActive consortium has identified the following technological novelties and innovation potential of the integrated, unique iWalkActive mobility solution:

- A **barrier-free navigation and orientation system** that is **especially tailored to the needs of walker users** and works seamlessly for outdoor and for indoor use. A walking path (e.g. to the next toilet) will never lead to obstacles such as stairs that cannot be mastered.
- Innovative **context-aware algorithms taking data from walker sensors** (current location, path, velocity, steepness, terrain, height, etc.) which allow the walker system to react in real-time to suit the user's needs or let the system and externals (in alignment with the

security policies) localise, monitor and track the walker in order to intervene in an emergency. Also an individual adaptation of the routes and the trips to the physical health and current condition of the user becomes possible thus supporting him optimally (suggesting routes/pauses ad-hoc).

- Innovative community concepts which allow taking the walker as an input device to learn, record and store new routes in a commonly accessible directory and let them rate.
- An innovative **SmartDevice-to-Walker interface** converting the walker to a dock to easily connect the high-tech ICT device to the mechanical frame and interact with it (and its additional sensing capabilities and the e-drive control mechanism).
- A novel, **intention-based, assistive e-drive** option (including an electrical braking system) that ideally supports the user while walking unobtrusively just heading in the direction and with the force he needs it in his current context. For this special application it is necessary to develop a higher-level control system which is integrating different sensor data and a conventional motor controller applying different modes and context-sensitive algorithms.
- A novel **mechanical walker design which overcomes physical obstacles**, i.e. curbs, thresholds and potholes, and uneven ground like cobbles, gravel, grass, sand and snow.
- An open **walker AppStore platform based on the uStore of universAAL** providing an **open walker API** for any other services provider who want to be included into the extensible walker ecosystem (e.g. emergency call system or vital signal monitoring based on heart rate and skin resistance sensors in the handles, walker as self-propelled dust cleaner, ...).

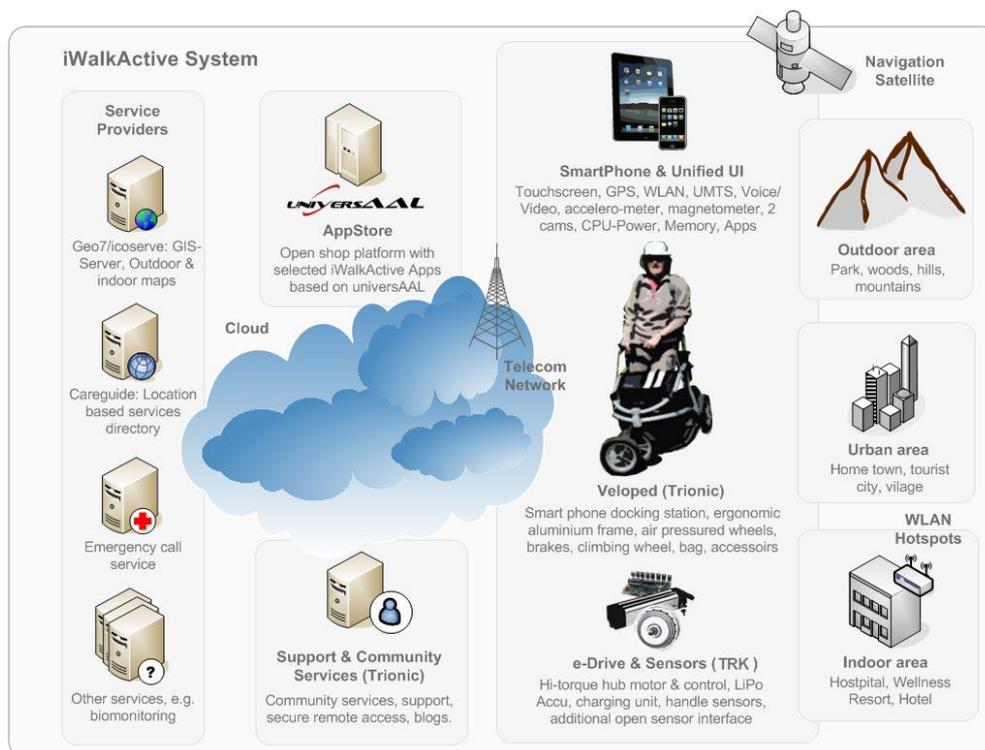


Figure 4: iWalkActive System Overview

Figure gives an overview of the iWalkActive System including all communication nodes and their distribution. It also indicates how the ICT hard- and software framework will be build up around the walker in order to allow for a seamless integration of the different services under the hood of a unified user interface running on the smart phone.

Instead of marketing, sales and distribution towards traditional mobility retailers, the active walker will be marketed, sold and rented out in the places where physical activities take place. The services and products will physically be placed at tourist resorts, sport hotels, hiking clubs & Nordic Walking

facilities. In addition, the iWalkActive will be marketed towards the end user on the Internet.