Home automation middleware to support aging-in-place

Citation for published version (APA):

Document status and date:
Published: 01/01/2011

Document Version:
Publisher’s PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:
• A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher’s website.
• The final author version and the galley proof are versions of the publication after peer review.
• The final published version features the final layout of the paper including the volume, issue and page numbers.

Link to publication

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

• Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
• You may not further distribute the material or use it for any profit-making activity or commercial gain
• You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the “Taverne” license above, please follow below link for the End User Agreement:
www.tue.nl/taverne

Take down policy
If you believe that this document breaches copyright please contact us at:
openaccess@tue.nl
providing details and we will investigate your claim.

Download date: 20. Aug. 2019
Home automation middleware
To support aging-in-place

Subject
Home automation systems are important in providing support for aging-in-place. The middleware of home automation, or ICT infrastructure, facilitates the applications and forms the backbone of the system (Figure 1).

Methodology
With the use of life scenarios that are based on health profiles, criteria for middleware are defined and used as a starting point for the development of a new middleware concept based on existing technologies (Figure 3).

Figure 1 User in relation to home automation applications and middleware

However, today's middleware technology is not able to support all needs within a single system, since needs among older people vary considerably (Figure 2). Most research projects develop their own focused middleware, although a single universal system is desired to support aging-in-place.

Figure 2 Mismatch between the broad range of user needs and current middleware technology

Goal
Elucidating basic user-needs in order to develop a universal middleware for home automation supporting aging-in-place

Expected results
• User needs supportive criteria for universal middleware
• A design concept for a universal middleware

---

Researcher: M. Brits / m.brts@tue.nl / 2012.10.24.7.5520
Supervisor: prof. dr. J.E.M.H. van den Boorn / j.e.m.h.v.denboorn@tue.nl
Program/Subprogram: PEBE - Performance Engineering for Built Environments
Host University: TU/e / Architecture, Building and Planning Department

3TU. TU/e Technische Universiteit Eindhoven University of Technology
ICT infrastructure for home automation supporting aging-in-place

Michiel Brink MSc, Prof. dr. J.E.M.H. van Bronswijk
Eindhoven University of Technology, Faculty of Architecture, Building and Planning, Performance Engineering for Built Environments (PEBE), Eindhoven, The Netherlands, m.brink@tue.nl

Subject
This research project investigates the concept of Ambient Assistive Living in relation to the state of the art of ICT for buildings, especially dwellings. The project combines knowledge about user needs in aging societies and new evolving technologies from the ICT domain applied to houses.

This project focuses on the ICT infrastructure of home automation. This is the technology that connects the components of the system (also called middleware). Since ICT infrastructure is a technical subject that has no direct relation with the end-user, user needs are rarely incorporated in the design of the technology. This causes mismatches between user needs and home automation performances.

Goals
The goal of this PhD project is to match user needs and performances of the ICT infrastructure in home automation systems that support aging-in-place

Research Question
Do current ICT infrastructure concepts match the end-user needs, and on what criteria can this be determined?

Strategy
User needs regarding home automation are retrieved from literature and verified by experts. Based on collected user needs, criteria are defined that ICT infrastructures should meet in order to match user needs. Current ICT infrastructures concepts are to be assessed based on the found criteria.

A new ICT infrastructures concept is made by improving the best assessed concept. Only existing technologies are used in the new concept, such as software agents, peer-to-peer and Service Oriented Architecture (SOA).

The new concept is validated by implementing it in both a virtual simulation environment, as well as in a laboratory setting. The simulation environment is to be validated by the laboratory setting. Test results show whether the ICT infrastructure is meeting the determined criteria and would match user needs.

Expected Results
Criteria for home automation ICT infrastructures which meet user needs are an expected result from this project. Furthermore, a new ICT infrastructure concept meeting these criteria is proposed and validated.

Preferred Partners Applications / Sponsors
This PhD project is funded by PIT Foundation (Stichting Promotie Installatietechniek) and the BAM.

Prime Publication / Prototyping

Research Period
2009-2013

6-11-2009