

Optimizing the added value and usability of
the Smartest Home of the Netherlands

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General Summary

The aim of this industrial project at Smart Homes¹, the Dutch expertise centre on home automation and smart living, was twofold. On the one hand, the level of appreciation of existing (concepts of) smart home applications was examined. In this purpose, (concepts of) smart home applications were first collected through field research, literature, and European and national projects Smart Homes contributes to. Afterwards, the collected (concepts of) smart home applications were filtered based on the smart home classification by Aldrich [1] and its appreciation was tested by means of a questionnaire. Based on the results of this questionnaire, the applications that were most appreciated were visualized. Ideally, these visualizations will be shown in the Smartest Home of the Netherlands, a test and demonstration home located in Eindhoven, to show visitors the added value of home automation (i.e. domotica).

On the other hand, the graphical user interface used to control the Smartest Home of the Netherlands was redesigned. First, the current user interface was evaluated by means of heuristic evaluations and the thinking aloud protocol. Next, the user interface was redesigned, based on the results obtained by the evaluations. Finally, this redesign was evaluated using an interactive PowerPoint prototype. In general, participants were quite positive about the redesign of the graphical user interface. They described the interface with quotes like “A serene and clearly structured interface”, “Clearly readable and easy to use”, and “Very efficient”. In the upcoming month, Smart Homes will implement this design in the Smartest Home of the Netherlands.

Besides examining the level of appreciation of (concepts of) smart home applications and redesigning the graphical user interface, a brainstorm session was organized to reconstruct the scenarios (i.e. scenes) implemented in the Smartest Home of the Netherlands and personas were created to visualize its possible inhabitants.

The results of this project will hopefully contribute to the optimization of the Smartest Home of the Netherlands.

¹ Smart Homes, <http://www.smart-homes.nl>

Management Summary

To examine the level of appreciation of existing (concepts of) smart home applications, three steps were taken. First, (concepts of) smart home applications were collected through field research, literature, and European and national projects Smart Homes contributes to. Next, the collected (concepts of) smart home applications were filtered based on the smart home classification by Aldrich [1] and its appreciation was tested by means of a questionnaire. 39 participants filled in this questionnaire (mean age 49.5, $SD = 20.4$). 53.8% of them are male and 46.2% of them are female. The results of this questionnaire not only provide a list of most popular and less popular smart home applications, it also captures and visualizes part of the reasoning behind these rankings. Finally, the applications that were most appreciated were visualized. In order to show visitors of the Smartest Home of the Netherlands the added value of home automation (i.e. domotica), it is recommended to show these visualizations during demonstrations given in the Smartest Home of the Netherlands.

For the redesign of the graphical user interface of the Smartest Home of the Netherlands, four steps were taken. First of all, the current user interface of the Smartest Home of the Netherlands was evaluated by means of heuristic evaluations and the thinking aloud protocol. These evaluations showed that most usability problems occurred because of low consistency, a minimal use of standards, and inefficiency of use. Based on these results, the graphical user interface was redesigned. Next, this redesign was evaluated using an interactive PowerPoint prototype. The results of these evaluations showed that participants were quite positive about the redesign of the graphical user interface. They described the interface with quotes like “A serene and clearly structured interface”, “Clearly readable and easy to use”, and “Very efficient”. Despite these positive results, there was still room for improvement. These points of improvement are incorporated in the final design of the graphical user interface.

For the implementation of the redesign of the graphical user interface it is recommended to make the user interface adaptive as well as dynamic. This means that the layout and elements of the user interface should change according to the user needs, its context, and/or the (prior) state of the system. These (real-time) adjustments will enhance the usability of the user interface. Furthermore, it is suggested to later on integrate the energy usage of the separate rooms of the Smartest Home of the Netherlands into the graphical user interface and to display the graphical user interface on the television screen located in the living room when the possibilities of home automation are demonstrated.

Furthermore, a brainstorm session was organized to reconstruct the scenarios implemented in the Smartest Home of the Netherlands and personas were created to visualize its possible inhabitants.

The results of this project will hopefully contribute to the optimization of the Smartest Home of the Netherlands.

This report is confidential. The content is available upon request.