Group-Based Expert Walkthroughs
to Compensate for Limited Access to Target
User Groups as in Case of Chronically Ill Patients

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Abstract. Involvement of real end users right from the beginning of an IT project is understood nowadays as good practice particularly in research projects where new and innovative concepts are to be investigated. In some situations, this is not feasible though, because this would cause unreasonable burden on target users, e.g., in case of chronically ill older patients or it is simply not possible, because administrative hurdles like permission by ethical committees need to be overcome, therefore it is necessary to install substituting methods. In the PICASO project (Personalised Integrated Care Approach for Service Organisations and Care Models for Patients with Multi-Morbidity and Chronic Conditions) this was achieved by implementing group-based expert walkthroughs where experts with different work-domain expert knowledge, in this case from usability, accessibility, clinical practice and software development, walked through an application by following typical usage scenarios target users are supposed to achieve. In contrast to the original method outcomes of walkthroughs were documented in form of software requirements, i.e. essential functionalities and features of the envisioned application instead of usability and accessibility issues. This way a reference document for developers evolved that closed the gap in bringing user requirements to application development.

Keywords: Group-based expert walkthrough · Usability inspection
User requirement engineering · Software requirements

1 Introduction

Involvement of real end users right from the beginning of an IT project is under-stood as good practice nowadays particularly in research projects where new and innovative concepts are to be investigated. The goal is to ensure that developments are useful and easy to use by the intended target user group. For this purpose user requirements are collected at the beginning of a research project which can be achieved by various methods among those are focus groups, interviews with users representing the target user groups and ethnographic methods such as participatory observation of the domain context. Such field studies help to understand the context-of-use and typical usage

scenarios of the envisioned application can be deduced which altogether build the base for elicitation of user requirements.

User requirements are descriptions of how a system is expected to perform from the user's perspective. They are intended to serve as primary source of in-formation for developers when determining system architecture and specifications as well as required software functionalities and features. To communicate user requirements in a suitable format they provide at its core a short but precise description of the user's need, a rationale for that and most important a fit criterion which states in a quantified manner when a user need is met, e.g. by providing a specified feature [1].

However, complexity of development projects has been rapidly increasing, so user requirements of the end application are not fully understood even after the phase of user requirements gathering has been completed resulting in high volatility of defined requirements. Beyond this, user needs and fit criteria cannot all be defined as precise as needed to serve as encompassing source for derivation of software requirements which is a precondition for creating an application that suits the domain context and is char-acterised by good usability and accessibility. It is rather to expect that user requirements will need substantial refinement and enhancement by new ones actually requiring further user involvement to ensure suitability to users' needs. In some situations this is not feasible though, because this would cause unreasonable burden on target users, e.g., in case of chronically ill older patients or it is simply not possible, because administrative hurdles like permission by ethical committees need to be overcome. Therefore it is necessary to install substituting methods. In the PICASO project (Personalised Inte-grated Care Approach for Service Organisations and Care Models for Patients with Multi-Morbidity and Chronic Conditions)[1] this was achieved by implementing group-based expert walkthroughs where experts with different work-domain knowledge, in this case from usability, accessibility, clinical practice and software development, walk through an application by following typical usage scenarios target users are supposed to achieve.

The PICASO project focuses on the needs of patients with multi-morbidity condi-tions such as Parkinson disease and rheumatism often combined with cardiovascular diseases and aims to build an ICT based integrated care platform to improve their treat-ment situation. It supports collaborative sharing of care plans across sectors in a cloud-based health platform ensuring data privacy. Furthermore, PICASO aims to stimulate the independence and empowerment of patients by offering home care applications to support self-management and self-monitoring of their diseases. For this purpose a mobile application was to develop which presents to patients a daily schedule with tasks to do like on-time medication intake, measuring blood pressure, taking weight, do self-recordings such as well-being ratings in accordance to the care plan defined by their physicians. To support patients in managing their tasks as required, reminders are provided. Moreover, patients are presented results of their measurements and self-recordings in form of combined graphs or tables also in retrospective to receive better understanding of their health situation and mutually reinforcing factors.

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[1] http://www.picaso-project.eu/.

2 Group-Based Expert Walkthroughs for Achievement of Software Requirements

As already mentioned the PICASO platform consists of applications for medical professionals like physicians as well as for chronically ill patients who could be involved in the initial phase of user requirements gathering in PICASO but not later on, so group-based expert walkthroughs were initiated to support the process of feeding collected user requirements into technical realisation of the envisioned applications. During these walkthroughs clinicians experienced with e-health applications, software developers and usability experts with a background in accessibility walked through early and evolving prototypes to discuss user requirements and how to satisfy these in terms of software requirements. Since partners in PICASO are situated in different European countries group sessions were organized as desktop-sharing sessions where developers presented the current status of their application. The presentation was aligned to typical usage scenarios users of this application need to accomplish. During the walkthroughs it was evaluated whether users would know what is the next step, which control or element should be selected to achieve the task goal as well as appropriateness of layout and work flow. Thereby arising lacks or weaknesses in functionality and accessibility were raised by experts from their individual point of view. The needs of chronically ill older people suffering from Parkinson disease or rheumatism which often causes inhibited fine motor skills were taken into account in particular. By bringing together expert knowledge from different domains usability issues could be identified, where relevance for the target user group can be assumed and feasible design solutions determined [2]. This is understood as one of the advantages of group-based expert walkthroughs.

Group-based expert walkthroughs are based on the methodology of the Cognitive Walkthrough developed by Catherine Wharton [3] which can be considered a well-established usability evaluation technique that has proven to provide excellent results in regard to identifying usability issues related to successful task achievement [4]. In PICASO this method was developed further in that usability professionals documented results of group-based expert walkthroughs not as a list of usability and accessibility issues as in the original method, but rather in form of software requirements, i.e. a description of required functionalities and features of the discussed application. This description was circulated among all group members and feedback collected until finally a reference document evolved that described agreed essential software requirements of viable PICASO applications. This reference document was understood as a very valuable source of information by PICASO developer to better transfer user requirements to software requirements on which base development takes place. In the upcoming user study it will be evaluated if and how usability and accessibility issues raised here will match with usability and accessibility issues discussed in the PICASO walkthroughs.

3   Conclusions

Installing group-based expert walkthrough sessions to compensate for limited access to target user groups like chronically ill older patients appeared to be a feasible solution in PICASO. This approach might work as well in similar situations such as when recruiting a critical number of test participants turns out to be impossible. In development projects recruitment of test participants with required characteristics, e.g. certain disabilities, often poses a problem. Beyond this, group-based expert walkthroughs offer the opportunity to meet more frequently during the development phase as it would be reasonable with real test users. Thereby, an iterative design approach is supported that is suitable to reduce the gap between understanding users' needs and actually implementing them. The approach followed in PICASO to document outcomes of PICASO walkthroughs in form of software requirements, i.e. required functionalities and features of the application aimed for rather than usability and accessibility issues turned out to be a powerful driving force to put user requirements into technical realization.

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