

Aligning User Centered Design Activities with established Software Development Practices

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ABSTRACT

The authors will present their experiences gathered by implementing a User Centered Design (UCD) Process in an existing product development lifecycle within the complex setting of a large healthcare software company.

This experience report will highlight how the authors succeeded to tie UCD practices to the existing software development cycle using use cases as a tool for requirement identification and capture.

Author Keywords

User Centered Design, Use Case, Requirement Engineering

INTRODUCTION

User Centered Design (UCD) is a methodology that is well established and described in today's literature ([3], [4]). From the authors' experience it can be said that many companies struggle with the adoption to UCD techniques and methods in their product development lifecycle. Whereas they see the advantages and recognize the need to increase the usability of their products, it is not always obvious how to correctly apply them.

The company referenced in this report realized that the future success of the software products would require an enhancement combining a user and workflow centered design approach with today's technology driven approach.

This case study will highlight the authors' practical experiences and findings they gathered during the implementation of an UCD process in an existing product development lifecycle of a large healthcare software development company.

APPROACH

The organization found it adequate that existing activities in software development and requirement engineering had to be aligned with the new UCD activities because in a day-to-day business processes cannot be reinvented from scratch and changed ad-hoc. New roles, tasks, artifacts (documents) and interfaces that might be introduced along need to be worked in. On top the dependencies to the existing processes and documentation need to be defined soundly and traceably and have to fit into the existing requirement engineering process.

The authors analyzed the given product development lifecycle and identified roles and activities that have to be adopted based on their experience and in compliance to existing UCD process models ([1], [5]).

Roles

Within the company a new role was created: the Workflow Analyst (WA). WAs are domain experts, such as medical doctors, technical assistants or unit clerks with long time experience in their field of work. WAs gather end users' information and are able to structure and revise the information adequately. In addition the authors introduced the idea of Concept Teams which are responsible for the translation of the analysis information into concepts and user interface designs. It consists of designers and usability engineers.

These newly introduced roles and their close collaboration among them enables a rapid exchange of knowledge and information that also provide a basis for continuous inspections of the results.

Documents

Information related to the user and their tasks and workflows are now gathered by the WAs. To capture, document and structure this information two types of use cases were introduced in this project:

The "Persona Use Case", as used in this project, is an abstract overview about a specific group of users. It is a conglomeration of the analysis results of multiple users in various contexts. The persona use case consists of a description of the user group and its variations depending on the factors, like their educational status or their context of work. It also includes impacts of the work environment,

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regional distinctions, and legal policies. Its main purpose is to establish and document the project wide understanding of the users in scope, their job and their environment. This leads to a clear and explicit definition of the target group of the solution.

The “Use Case”, as applied in this project, describes the flow of work from the end user’s perspective (similar to [2]). It reflects the real life situation and how the end user has to deal with certain situations while performing a specific task. It includes all information and data the end user needs, a description of tools use and also the variations and alternatives ways to perform the task. The detailed workflow is documented in so-called “Use Scenarios” within the use cases. They describe the intention and the expected system response for each single step in the user’s workflow. Thus, the use case does not describe the solution, but generally identify the flow of work, the flow of information, supports the decision-making process and additionally surfaces important related requirements. Later on in the process, during the implementation phase, the scenarios are decomposed and development requirements are derived.

The use cases are not only used as the main artifacts to capture the knowledge about the users and their workflow. They are also key for integrating the results from the UCD practices into the development process. In addition, the concept team uses the use scenarios to create user interface designs and concepts to document the users’ flow of work. Test cases are directly derived from the use cases to validate developed concepts and solutions.

Mapping to Requirement Engineering

To connect the user workflows with the requirement engineering process, each use scenario is represented as a single requirement, called “Use Case Requirement”. According to the workflow description and the captured user needs each use case requirement is decomposed into development requirements, which is done in cooperation by the requirements engineer, the architect, the WAs and developer. Thus, there is a relationship of one use case requirement to multiple development requirements. The sum of development requirements that are mapped to the use case requirements represents the user’s workflow from a ‘development point of view’.

The use scenarios and the corresponding use case requirements support the decision making process and help to prioritize and to select requirements for the product release specification:

- Based on use scenarios it can be decided which workflows should be implemented. The corresponding

use case requirements point to the corresponding development requirements.

- Vice versa, it is now obvious if specific development requirements influence a use case requirement and whether it influences the corresponding use scenario, which could have an immanent impact on the user’s integrated workflow.

Thus, the result is a process that combines practices of requirements engineering with the results of the UCD process likewise. Through this the users’ workflows are now traceable like other requirement types.

CONCLUSION

The use cases are now used as a communication medium across the departments involved. They foster a common understanding of the product scope. The persona use cases provide an overview of the users’ daily business and environment. The use cases help to get a deeper understanding of the users’ goals and how they perform domain specific tasks.

The integration of the use cases to the requirement engineering process supports the decision-making process. It helps to determine workflows that need to be supported by the software. The use case documents serve as a guide and guarantee that the user requirements (as described in the workflows) are realized.

The use cases are the basis for decisions that need to be made during the development process. Therefore this is a tangible solution which ties UCD activities and their results to an existing and established software development processes.

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