Aalto University
School of Science
Degree Programme of Computer Science and Engineering

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In-house software development process:
The usability perspective

Master's Thesis
Espoo, June 5, 2013

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Supervisor: Professor Marko Nieminen
Instructor: Jouni Kuusinen M.Sc. (Tech.)

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Abbreviations and Acronyms

ERP	Enterprice Resource Planning
SUS	System Usability Scale
ISI	Interaction Sequence Illustration
UI	User interface

Contents

Chapter 1

Introduction

In this chapter, the background and reasoning for the thesis is described together with the focus and limitations of the research. In the text, research problems and the structure of the thesis will be also defined.

1.1 Motivation and methods

The term Enterprise Resource Planning (ERP) was invented in the early 1990s.[2] The purpose of the ERP software is to offer techniques and concepts for integrated and thorough management of business, as well as making it more efficient. The usage of ERP software has increased globally and nowadays even service organizations have invested lot of resources in ERP implementation.[1, 3]

Despite the importance of the efficiency aspect, the usability of ERP systems is not a widely studied topic. However, weaknesses in usability may lead into a low productivity and make it harder for users to achieve their goals.[4]

The aim of this thesis is to examine if the usability of a service-oriented ERP system can be enhanced by integrating usability inquiries, inspections and measures into the software development process. In the research, one well defined business process is examined and the state of its usability in the system is determined by using variety of applicable methods:

- Contextual Inquiry to define the business process.
- Cognitive walkthrough for usability inspection.
- Interaction Sequence Illustration (ISI) to measure the amount of interaction steps in the process.

- System Usability Scale (SUS) to give a global view of subjective assessments of usability.
- Remote Usability evaluation and Usability logging for remote usability evaluation.

The measurements are focused on time, error rate and user satisfaction.

1.2 Background and research questions

The subscriber of this thesis is a middle-sized company which is offering information services globally and practicing in-house software development. Because of the fast pace of growth, the company is willing to reform their current ERP system as well as the whole software development process. The aim of this thesis is to join usability perspective into this process and give answers to following research questions.

- ***How usability methods can help to identify critical disparities in the usage of a system?***

  Understanding the differences in the system usage between individuals can help to understand and deploy best practices throughout the organization and therefore improve efficiency.

- ***How the user efficiency is affected by the usability measurements?***

  It is important to find the most effective and usable user interface solutions and thus decrease the average time spent on tasks. Local differences can be tracked with remote usability measurements.

- ***What usability methods can be practically joined with the software development process of an ERP system?***

  Finding practical and efficient usability methods to be joined with the software development process can improve the quality of the end product.

1.3 Scope and structure of the thesis

This thesis covers research about usability of the in-house software development process and its scope does not include any other aspects of the process. The literature research consists of a few usability methods and even though

the target of the research is ERP software, literature about them are not covered in the thesis. The results of the research may not be suitable for every organization.

The first actual chapter of the thesis is about the usability methods. Every usability method used in the research is discussed carefully. In the second chapter the process experiment is being introduced. It covers the experiment steps and the implementation details. In the third chapter, the data gathered in the experiment, and the implementation process is being analyzed. In the last chapter the research will be summed up and discussed.

Chapter 2

Methods

In order to be able to discover reliable research data, the research methods must be understood thoroughly. In this research, the data is gathered with a few types of usability methods. Inquiries are used to study the business process. The process itself is measured from many different aspects and also remote evaluation is used. All the methods is described in detail in the following chapter.

2.1 Contextual Inquiry

2.2 Process measurement

2.2.1 System Usability Scale

2.2.2 Cognitive Walkthrough

2.2.3 Interaction Sequence Illustration

2.2.4 Time used and success rate

2.3 Automated Remote Usability Evaluation

Chapter 3

Process experiment

Introduction to the chapter.

3.1 Steps

- Creating the model for gathering data
- Modified contextual inquiry
- Process measurement methods
- Analysis 1.
- Prototype creation
- Remote evaluation -¿ process measurement methods.
- Analysis 2.

3.2 Implementation

Chapter 4

Analysis

4.1 Results

-Comparison between country offices

4.2 Implementation analysis

-Should these methods be implemented as a part of the process or not.

Chapter 5

Discussion and conclusions

Bibliography

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Appendix A

SUS form

Appendix B

TEST form