Course Description

Requirements Management

Contents

The Big Idea

"Requirements management is the process of documenting, analyzing, tracing, prioritizing and agreeing on requirements and then controlling change and communicating to relevant stakeholders. It is a continuous process throughout a project." (Requirements Management (Wikipedia), retrieved 5 April 2018)

The course "Requirements Management" aims to teach students how to handle requirements once they are obtained. Apart from identifying requirements for a certain project, the management of these requirements lays at the heart of successful project management. Practice shows that without the maintenance and management of requirements within a project, the needs and expectations of all stakeholders are not matched. The management of requirements requires a clear understanding of which needs which stakeholder has, how they will be addressed and when. In order to establish the management process, a detailed understanding of how priorities are idendentified, how the process of fulfilling the requirements and finally the communication about requirements is necessary. This will be the topic of this course.

A special focus will be on requirements management for web project. While the methods applied remain the same, the scenarios and settings are quite different and require special

attention. Therefore, based on the general introduction, requirements management for web projects will be at the core of the course.

The course will briefly revisit the elicitation process of requirements to ensure an understanding of how they are developed. Then, the specific phases of the management process will be discusses and studied using real-world examples with a focus on web projects. The discussion will facilitate a common understanding of the impact of requirements management. Finally, using the acquired knowledge, students will actively employ requirements management to experience advantages and disadvantages.

A specific focus will be on the notion of requirements engineering for web projects. Based on a common understanding of requirement managements, the specific scenarios of web project development require tailoring.

Intended Learning Outcomes

The course focuses on enabling students to understand and utilize the notion of requirements engineering, specifically for web project development. Students will be able to discuss the more critical and important elements of the use of requirements management.

In particular, students will be able to:

- Demonstrate an understanding of research related to requirements engineering
- Understand the impact of using requirements management
- Understand the mechanisms behind requirements management
- Actually employ concepts of requirements management
- Exhibit analytical skills, and apply theories to discuss different usage contexts of requirements engineering with a focus on web project development
- Reflect on the use of requirements management in daily application scenarios
- Assess the usage of requirements management in different contexts

Structure of the Course

The course is structured into three chapters:

- Chapter 1 is a brief review of the common practices and approaches to requirements engineering.
- Chapter 2 will deal with the management of requirement changes and their bidirectional traceability. In addition, requirements management for web project will come into the focus.
- Chapter 3 will conclude the course with concepts to ensure the alignment between project work and requirements.

Didactic Concept, Schedule and Assignments

The course is setup as a series of online workshops with the didactic idea that you learn most if you have to teach it. Hence, each student will play the role of the teacher for a specific part of the

course. The workshops take place on three evenings as synchronous events in three hours each. Equal emphasis is given to continuous cooperation in the form of discussions and clarifications through email, discussion forums, and other tools in the learning platform.

The course is taught as a reading class, meaning that students are expected to do reading assignments before each workshop, and to actively participate in the discussions. The learning objectives emphasize the ability to competently take an active part in discourses on issues of requirements management. Therefore, the didactic concept emphasizes interactions between the student and the lecturer as well as among the students, specifically with students explaining specific concepts of requirements management and engineering to their fellow students. The interactions require a solid body of knowledge which is to be established based on the referenced resources.

Each workshop is organized in three phases. In the first phase, the students present the results of their homework with a follow-up discussion among all students on the presented results. In the second phase, the teacher gives an introduction to the respective workshop topic. In the third phase, the new assignment is presented and students start to work out how to approach the given problem. The given problem is then solved outside the workshop sessions in teamwork organized by the students. Using the usual communication facilities like wikis, blogs, twitter, etc. students are required to report on their progress, ask questions, etc.

The assignments are selected to explain course-relevant knowledge through small research-oriented questions with small demonstrations and explanation activities. This way, students introduce new knowledge to their fellow students while their fellow students and the teacher act as discussion counterpart.

Introductory on-site session

In this first session, the topic of requirements management is introduced. A brief review of how requirements engineering works will be conducted, with real-world examples coming from the experiences of the students in their daily life. Topics to be addressed include the elicitation of requirements, their validation and finally their management.

Working material

- Intro to requirements engineering and managment

First online workshop

The first online workshop deals with requirement elecitation, respective concepts and methods. Taken from there, we develop the basis for the management of requirements. Concepts and tools are discussed to create, edit and delete requirements. Furthermore, ways to ensure traceability of requirements and their versioning will be examined and in practical experiments developed. Students will be asked to carry out requirements engineering including requirements management for their project. This activity will be executed during the course and will serve as a real-world application of the course contents.

Work materials

- Intro slides for requirements engineering
- Requirements Elicitation (Part 1) by Armin B. Cremers, Sascha Alda in their course Organizational Requirements Engineerinof B-IT
- Requirements Elicitation (Part 2) by Armin B. Cremers, Sascha Alda in their course Organizational Requirements Engineerinof B-IT
- Nice overview on requirements engineering by Andreas S. Andreou

Homework

Write a problem statement and a scenario of your web development project. Submit this via email the day before our next online session.

Second online workshop

The second online workshop deals with the reduction of the complexity of requirements. Often, the structure of requirements and their dependencies is quite large. Nevertheless, only a subset of requirements is relevant for the task at hand. Hence, respective methods to identify the relevant requirements are introduced, e.g. structuring and prioritizing concepts.

In addition, a focus will be laid on the specific setting of requirements engineering for web projects. Web projects are specific in that they are more agile with constantly changing goals and requirements, unclear starting scenarios and often changing stakeholders. Consequently, the general methods of requirements management must be adapted to these new settings.

Work material

- Requirements Analysis and Validation by Armin B. Cremers, Sascha Alda in their course Organizational Requirements Engineerinof B-IT

Homework

Refine problem statement and scenario of your web development project. Elicitate all requirements you can derive from the problem statement (and scenario if possible). When stating the requirement, include some reasoning why this is a requirement. Use free form, e.g. a table. Submit homework two day before our next online session.

Third online workshop

The third online workshop discusses concepts that ensure the alignment of requirements with the ongoing project work, specifically in the area of web project development. The alignment ensures that requirements remain traceable, that their changes are uptaken, reflected in the project plan and addressed. The concepts and approaches discussed here finalize the discussion on the requirements management by closing the circle from requirements elicitation, validation and management.

Work material

- Wikipedia on scenarios for software development
- Suggestion on how to write a problem statement
- SOPHIST book chapter on refinement of requirements
- SOPHIST book chapter on templates for writing requirements
- SOPHIST book chapter on requirements managment and reuse

Homework

Refine and turn in by May 14:

- Problem statement - not longer than 0.5 A4 page
- Scenarios outlining all key functionality of your project - not longer than 2 A4 pages
- At least 5 key requirements derived from the the scenarios and the problem statement

Concluding on-site session

This on site workshop concludes the fourth phase and the course as a whole in a plenary session, where students present their results. Selected questions, assumptions and hypotheses will be discussed and clarified.

Examination

The participants are asked to continuously feed a diary, documenting their learning process and their contributions. Contributions are

- questions, assumptions and hypotheses formulated during the course,
- contributions to discussions in forums and in the plenum, and
- contributions to assignments.

The quality of the contributions with respect to the learning process is appraised by the lecturer and form 50 % of the final grade. During the concluding on site appointment a written examination of 45 minutes is to be passed, which forms 50 % of the final grade.

References

Recommended Reading

- Suzanne Robertson, James Robertson. Mastering the Requirements Process: Getting Requirements Right. Addison-Wesley Longman, Amsterdam; Auflage: 3rd revised edition. (6. August 2012) Mike Cohn. User Stories Applied: For Agile Software Development. Addison-Wesley Longman, Amsterdam (1. März 2004) (This book is not online available, but see below.)
- The main info of the book is also available in a number of articles by the same authors on the homepage of the book. The titels of the articles are:
- Volere Requirements: How to Get Started
- and on the articles page:

    - Volere Requirements Techniques: an Overview
    - Work Scope and Product Scope: Why Both?
    - From Business Event to BUC
    - Requirements - a socio-technical discipline
    - How Now Brown Cow
    - Atomic Requirements: where the rubber hits the road
    - Use Cases for Useful Points of View
    - Volere Agility
    - Models or Natural Language, which is best for requirements?
- Stuart R. Faulk. Software Requirements: A Tutorial. Software Requirements Engineering 2nd Edition, R. Thayer. M. Dorfman, Eds., IEEE Computer Society press, 1997
- Ivar Jacobson, Magnus Christerson, Patrik Jonsson & Gunnar Overgaard, Object-Oriented Software Engineering A Use Case Driven Approach. Addison-Wesley, 1992

Further reading

die SOPHISTen, Chris Rupp. Requirements-Engineering und -Management: Professionelle, iterative Anforderungsanalyse für die Praxis. Carl Hanser Verlag GmbH & CO. KG, 2009

- Dhiraj Shetty. Software (requirement) analysis using uml
- Neil Maiden, Editor of the Requirements column in IEEE Software, with Suzanne and James Robertson of the Atlantic Systems Guild about the emergence and impact of agile practices on requirements work
- Capability Maturity Model Integration
- Wikipedia on Requirements Analysis, retrieved 4 January 2013
- Wikipedia on Requirements Engineering, retrieved 4 January 2013
- Wikipedia on Object-oriented analysis and design, retrieved 4 January 2013
- Wikipedia on UML, retrieved 4 January 2013,

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