

Software Requirement Specification MoRe- Man

A software Requirement Specification, SRS, for the company ImagniCorp specifying a future software system named MoRe-Man

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1. The Purpose of the Project

1a. The User Business or Background of the Project Effort

This document is the software requirements specification, SRS, for the system MoRe-Man for the software development company called ImagniCorp. MoRe-Man is a combination of web and mobile application to support Requirements Engineering process. This document is based on Volere Requirements Specifications Template 1995-2010 and is being developed by the group 5.

ImagniCorp is the medium sized software development company having approximately 100 employees. The company works on different types of software projects.

ImagniCorp needs a software system for managing their requirements engineering process. Today, this work is done manually which is time consuming and fault prone due to complexity of the process. The following main problems are detected by the current practice: lack of necessary information to make decision, coordination problem, lack of traceability and communication overhead.

To assign requirement and to check the progress of the requirement in their current work process, Project Manager uses email communication and face to face meeting. First method can cause misinterpretation and later is time consuming.

There is no central system to manage all the information needed for managing requirements. Thus, to get this information, there is a need to communicate related people, which leads to communication overhead. Also lack of forward and backward traceability of requirements and lack of overview makes the current practice fault prone.

1b. Goals of the Project

The purpose of the project is to develop a system for the ImagniCorp that addresses the problems stated in the section 1a and eases their requirements engineering management process. The system MoRe-Man should remove as much manual work as possible from their Requirements Engineering process and provide necessary information to the participants by centrally managing related information.

2. The Stakeholders

The stakeholder identification has been done using the Sharp stakeholder identification process [1]. We started by identifying the baseline stakeholder based on four groups; Users, Developers, Legislators and Decision-makers. Then we identified suppliers, clients and satellites for each one of the stakeholder groups. The result is shown below.

2a. Baseline stakeholders

The users-group consists of ImagniCorp Developers, Requirements Engineers, Project Managers and Product Managers.

The suppliers for the users are as follows:

- **Developers:** Since a Project Manager supplies a Developer with requirements we identified the Project Managers as the supplier to the Developers.
- **Requirements Engineer:** The customers of ImagniCorp, since they supply the Requirements Engineer with requirements.
- **Project Managers:** The Project Managers are supplied with projects by product managers.
- **Product Managers:** The Product Managers are supplied with project requests by the customers of ImagniCorp.

The clients for the users are as follows:

- **Developers:** The Developers supply the Project Managers with solutions.
- **Requirements Engineer:** The Requirements Engineers supply Project Managers with requirements.
- **Project Managers:** Project Managers supply information about the status of projects to the Product Managers.
- **Product Managers:** Product Managers supply customers with products.

The Satellites for the users are as follows:

- **ALL:** CEO is the satellite for every user in the users-group.

Developers-group

We identified the developers-group to be us, Requirements Engineering Group 5, short Group 5.

The suppliers for the developers are as follows:

- **Group 5:** The CEO of ImagniCorp is the supplier for group 5.

The clients for the Developers are as follows:

- **Group 5:** Group 5 supplies the CEO of ImagniCorp with the product(s).

The satellites for the developers are as follows:

- **Group 5:** none

Legislators-group

We did not identify any legislators.

Decisions-makers-group

The CEO of ImagniCorp is the decisions-makers-group.

The suppliers for the decision-makers are as follows:

- **CEO:** The CEO of ImagniCorp is the supplier for group 5.

The clients for the decision-makers are as follows:

- **CEO:** Group 5

The satellite for the decision-makers is as follows:

- **CEO:** none

2e. Personas

Anders Johansson a 35 years old employee at ImagniCorp. Mr. Johansson holds a Master's degree in Computer Science from Chalmers University of Technology. Since his graduation 12 years ago he has been working on 2 other companies before ImagniCorp, and he is currently starting his 8th year at ImagniCorp. During his time at his current employee he has had a variety of different positions in the company. He started out as a Requirements Engineer and after a while he went in to development before going on to the testing and verification team. As a result of hard work and good reputation among his co-workers he was appointed Project Manager of his first project in 2009 and has been working as a Project Manager since that year. Due to the fact that he possesses a very good basis as a result of working in different departments of the software process he has made a great Project Manager and is known for delivering high quality projects fairly on budget and time.

Mr. Johansson and his wife since 5 years, Kate Johansson, have three children named Tim, John and Anna. Both Mr. and Mrs. Johansson are very interested in sports and are both competitive people.

Mr. Johansson has a big interest in new technology and through his education and professional experience he has gained a deep knowledge about software system and implementation processes. The knowledge that Mr. Johansson possesses is a good estimation for the average knowledge between the Requirements Engineers and the Developers at ImagniCorp.

2h. Maintenance Users and Service Technicians

The administrators and maintainers for the system will be the developers of the system, which in this case is us, Group 5.

3. Mandated Constraints

3a. Solution Constraints

ID: C1

Title: Type of the system

Description: The system shall be developed as a web and a mobile application. The web application contains the main functionality of the system. The mobile application is for viewing purposes.

Rationale: The customer wants the system to be two front end applications, a web and a mobile application.

Fit Criterion: The mobile application shall be able to operate on Android version 2.0 platform and higher. The web application shall be able to run in the most popular web-browsers, including: Google Chrome, Mozilla Firefox and Internet Explorer.

3c. Partner or Collaborative Applications

ID: C2

Title: Use of existing email system

Description: The system shall be integrated to the existing email system that MagniCorp is using at the present.

Rationale: The customer doesn't want to order email system to be developed for the system while they have existing system.

Fit Criterion: none

3e. Anticipated Workplace Environment

ID: C3

Title: Developers shall not have access to the mobile application

Description: The Developers shall not have access to the mobile application.

Rationale: The customer does not want the Developers to work at home.

Fit Criterion: The mobile device shall not allow Developer-accounts to log in.

3f. Schedule Constraints

ID: C4

Title: Release dates

Description: The first release date shall be within six month and the second one within two month after the first release.

Rationale: The system needs to be in use before next summer.

Fit Criterion: none

ID: C5

Title: Third release

Description: If there is a third release, it shall improve the system.

Rationale: All functionality should be implemented in the first two released and only delighters should be implemented in the third.

Fit Criterion: none

4. Naming Conventions and Terminology

4a. Definitions of All Terms, Including Acronyms, Used in the Project

The system: The system to be developed, “MoRe-Man”.

ImagniCorp: The client company, to which the system to be delivered.

Novice user: A user who has no previous knowledge of the system

LOC: metric of lines source of code

CEO: The CEO of ImagniCorp. Can see and access all the projects. Has access to the Mobile application.

Product Manager: The Product Manager of a certain project, one project can only have one Product Manager but one Product Manager can have many projects. Can view and access projects which he is in charge for. Has access to the Mobile application.

Project Manager: The Project Manager of a certain project. One project has only one Project Manager and one Project Manager is only in charge of one project. Has access to the Mobile application.

Developer: A certain Developer of a certain project. One project can have many Developers but one Developer is only connected to one project.

Requirements Engineer: A certain Requirements Engineer. One Requirements Engineer can have many projects.

Administrator: An Administrator have access to the Administrative page of the web application with the authority to handle the projects and team members from this page.

Login page: This page is the first page of the web application. Here the user can login to the web application, retrieve his password, get help with the login or see some basic information about the web application and the mobile application. Every user has access to this page. An overview of this page is illustrated in figure 1, Appendix I.

Projects Overview page: This is the page that provides the user with an overview of the current projects which he is associated with. This is the page to which a CEO or a Product Manager is directed to after a successful login. A CEO will be able to see all ongoing projects while a Product Manager will see the projects which he is in charge for, the user can from this page access a certain project. The CEO, Product Manager and Requirements Engineer have access to this page. An overview of this page is provided in figure 2, Appendix I.

Information Overview page: This pages gives the user an overview of the project by providing the available information for the project. The Project

Manager is directed to this page after a successful login. To this page the CEO, Product Manager, Project Manager and Requirements Engineer have access. Each role, except the Requirements Engineer, have the authority to edit the information on this page. This page is illustrated in figure 3, Appendix I.

Requirements Overview page: This page gives the user an overview of all requirements for this project. Here the Project Manager can assign requirements or delete requirements. A Requirements Engineer can add a new requirement here as well. After a successful login the Requirements Engineer will be directed to this page. To this page the CEO, Product Manager, Project Manager and Requirements Engineer have access. This page is illustrated in figure 4, Appendix I.

Team Members page: This page is intended to provide the CEO, Product Manager or the Project Manager with information about the team members in a certain project. A Project Manager can assign or unassign a requirement for a certain Developer on this page. This page is illustrated in figure 5, Appendix I.

Specific Requirement page: This page gives the user an overview of a specific requirement, here he is provided with additional information about the requirement and a Developer is able to increase the progress of his requirement here. This is the page that the Developer is directed to after a successful login. A Requirements Engineer can edit or delete the requirement. The CEO, Product Manager and Project Manager also have access to this page. This page is illustrated in figure 6, Appendix I.

Functional Requirement page: This page provides the user with a template for the functional requirement in which a Requirements Engineer can write a new requirement or edit a requirement. Here the user can fill in what test cases the requirement is connected to or other options to ensure traceability. A Project Manager can assign a Developer to a requirement through this page. This page is illustrated in figure 7, Appendix I.

Quality Requirement page: This page has the same functionality as the *Functional Requirement page* with the difference that this is for Quality requirements. This page is illustrated in figure 8, Appendix I.

Administrative page: This page illustrates the page created for the Administrator of the system. This is the page that the Administrator will be directed to after a successful login; here he can manage projects and team members. To this page only the Administrator have access. This page is illustrated in figure 9, Appendix I.

Login page - Mobile: This is the login page of the mobile application. Here the user can login to the mobile application. To this page the CEO, Product Manager and Project Manager have access; these are the only ones who have access to the mobile application. This page is illustrated in figure 10, Appendix I.

Projects Overview page - Mobile: This page provides the same information as the *Projects Overview page* but for the mobile, without possibilities to modify. Here the user can view projects and their progress. To this page the CEO and Product Manager have access. This page is illustrated in figure 11, Appendix I.

Information Overview page - Mobile: This page provides the same information as the *Information Overview page* but for the mobile, without possibilities to modify. Here the user can view the information about project and its progress. To this page the CEO, Product Manager and Project Manager have access. This page is illustrated in figure 12, Appendix I.

Requirements Overview page - Mobile: This page provides the same information as the *Requirements Overview page* but for the mobile, without

possibilities to modify. Here the user can view requirements and the progress. To this page the CEO and Product Manager, Project Manager and Project Manager have access. This page is illustrated in figure 13, Appendix I.

Team Members page - Mobile: This page provide the same information as the *Team Members page* but for the mobile, without possibilities to modify. Here the user can view team members and their information. To this page the CEO and Product Manager, Project Manager and Project Manager have access. This page is illustrated in figure 14, Appendix I.

Notification bar - Mobile: This illustrations shows how a Project Manager's notification bar on his mobile may look like if Developers have finished the implementing the requirement. This is shown in figure 15, Appendix I.

5. Relevant Facts and Assumptions

This section will present some facts about the project as well as the stakeholders that the reader should know about. These can contribute to new requirements.

5a. Relevant Facts

This subsection states relevant facts about the company and the project that might affect the eventual design and development of the system.

- The company ImagniCorp is an IT company and their employees are thereby assumed to have enough experience with computers to be able to learn and handle the new system quite fast.
- All our requirements have been based on interviews.
- The interview for requirements elicitation has been performed with the CEO of ImagniCorp.

5b. Business Rules

This subsection will present business rules that the company ImagniCorp have incorporated in their everyday work.

- Developers are not allowed to bring their unfinished tasks home and work overtime.

5c. Assumptions

This subsection will present assumptions about the clients working environment made by the developing teams.

- It is assumed that since the client, ImagniCorp, is an IT development company, there will be workstations present so that the employees can start using the system once it is developed. If the assumptions are false the product will not be usable until ImagniCorp buys workstations.
- It is assumed that the employees at ImagniCorp are using at least one of the standard browsers Google Chrome, Mozilla Firefox or Internet Explorer. If the assumptions are false, the effects on the product will vary depending on the browser(s) that they are using. The effects will mostly be on the user interface of the web application.
- It is assumed that the employees at ImagniCorp are using android devices with a version number higher than 2.0. If the assumptions are false, they will not be able to use the mobile application.

6. The Scope of the Work

The scope of this project is to develop a web application and a mobile application for the company ImagniCorp. The applications shall aid the company's requirement engineering management.

6a. The Current Situation

The handling of requirements at ImagniCorp is today carried out manually. This leads to ineffective transfers and makes it hard to trace requirements.

6b. The Context of the Work

The following figure illustrates the different actors connected to the requirement management's process.

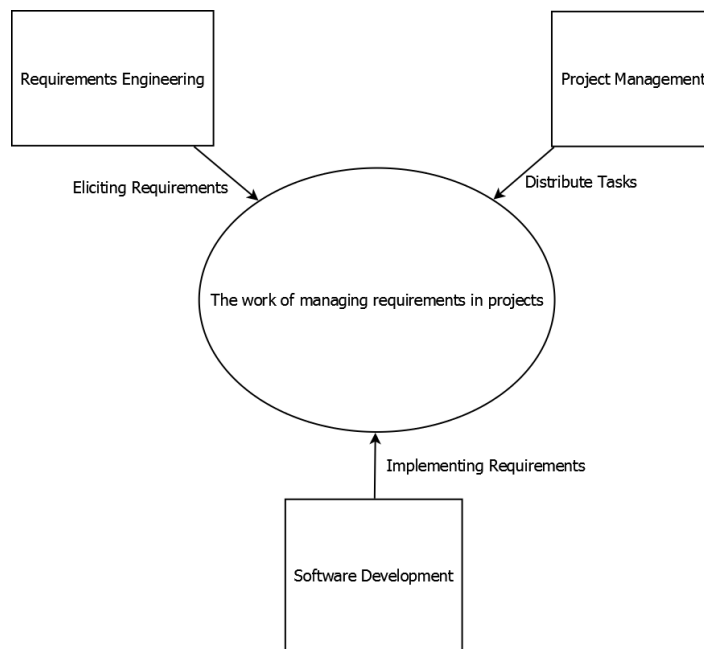


Figure 6.1

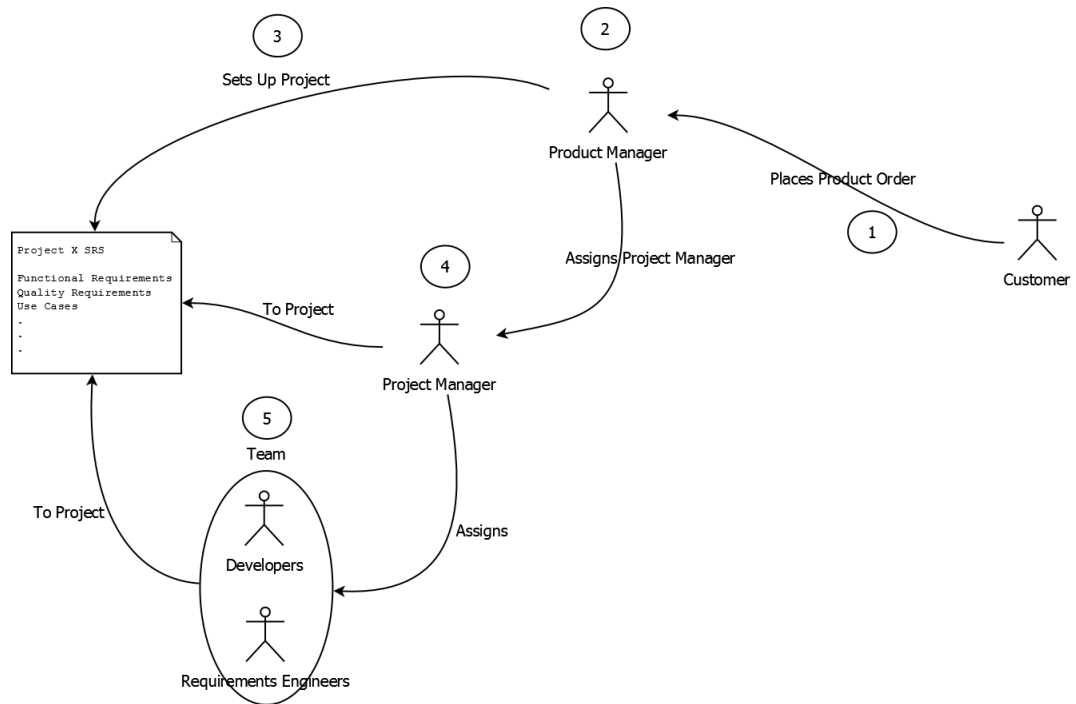
6c. Work Partitioning

Event Name	Input and Output	Summary of BUC
1. Initiate project	Input: Customer places order Output: Product Manager accepts task.	Customer orders a product and the Product Manager starts a project upon accepting the task.
2. Develop functionality	Input: Requirements from Requirements Engineer.	The Requirements Engineer elicits requirements from the customer that eventually get implemented by the Developers.
3. Release process	Output: New project release to Customer.	A Project Manager finishes a release and it gets released to the customer.

Table 6.1 – BUC table

6d. Specifying a Business Use Case (BUC)

Business Use Case 1

**Designation:** BUC-1**Name:** Initiate project**Description:** The customer requests new software from ImagniCorp.**Trigger event:** The customer wants new software**Actors:** Customer, Product Manager and Project Manager.**Precondition:** ImagniCorp has the resources to take on a new project.**Postcondition:** A project is created and a team is assigned to develop the requested software.**Main scenario:**

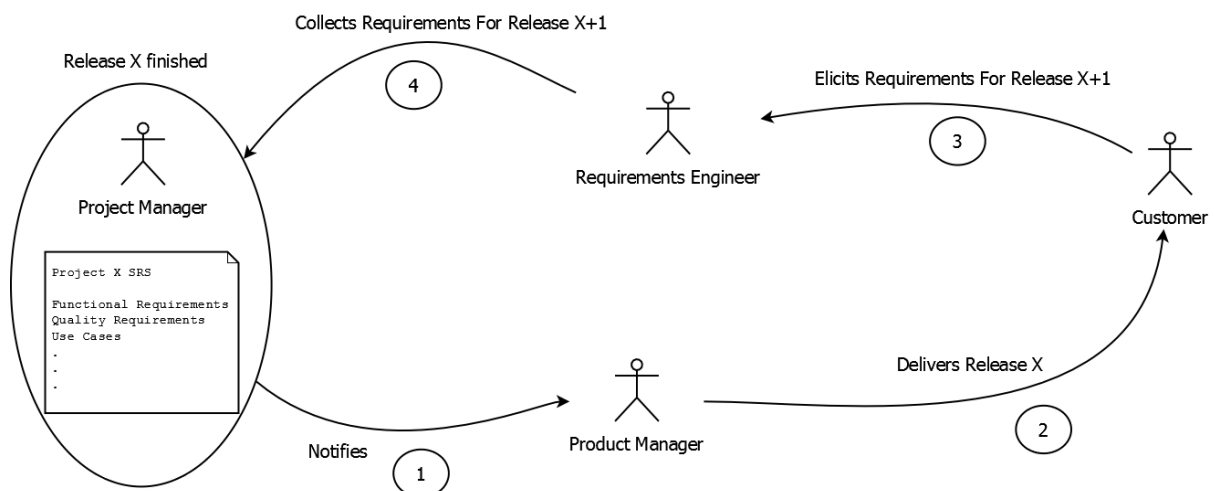
1. The customer contacts the Product Manager and requests software.
2. The Product Manager evaluates the request and decides whether ImagniCorp will be able to perform the task.
3. The Product Manager creates a new project.
4. The Product Manager assigns a Project Manager to the project.
5. The Project Manager adds seven Developers and a number of Requirements Engineers to the project.

Main scenario:

- The Requirements Engineers contact the customer and elicit requirements.
- The Requirements Engineers add the requirements to the project.
- The Project Manager assigns a requirement to a Developer.
- The Developer develops software covering the assigned requirement.
- The Developer reports back to the Project Manager when the Developer has finished implementing the assigned requirement.
- Repeat step 3 to 5 until all requirements are implemented.

Alternative scenario:

- 6a. Create a release version of the software.
- 6b. Then perform step 3 to 5 until next release.

Business Use Case 3**Designation:** BUC-3**Name:** Release process

Description: MagniCorp delivers a release version to customer and collects information about further development.

Trigger event: The project has reached a release date.

Actors: Customer, Product Manager, Project Manager and Requirements Engineers.

Precondition: There exists a project that is enough progress to make a release.

Postcondition: The customer has received a release version of the requested software and the Requirements Engineers have gained new information to add

to the requirements connected to the project.

Main scenario:

1. The Project Manager notifies the Product Manager about the finished release version.
2. The Product Manager delivers the software to the customer.
3. The Requirements Engineers contact the customer and elicit more requirements.
4. The Requirements Engineers add the requirements to the project.
5. Requirements are implemented by the project team as described in BUC-2.
6. Repeat step 1 to 5.

Alternative scenario:

- 6a. Deliver the final release of the software.
- 6b. Close down the project.

7. The Scope of the Product

7a. Product Boundary

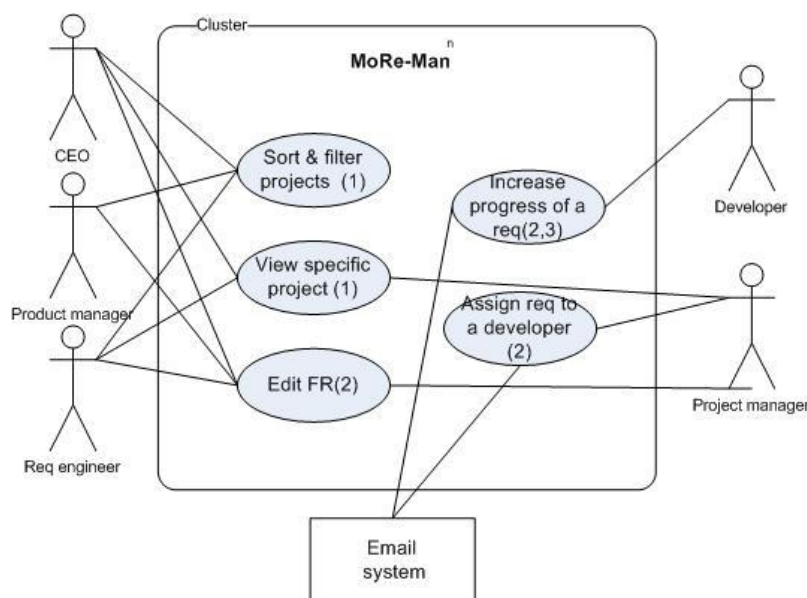


Figure 7.1 - Use case diagram

The number beside each use case refers to respective business use case that it is derived from.

7b. Product Use Case Table

PUC No	PUC Name	Actor/s	Input & Output
1	View specific project information	CEO, Product Manager	<i>Information Overview page</i> is displayed (out)
2	Sort and filter projects	CEO, Product Manager, Requirements Engineer	Sort criteria (in) Sorted projects (out)
3	Edit functional requirement	CEO, Product Manager, Project Manager, Requirements Engineer	Changed requirement (out)
4	Increase progress of a requirement	Developer	Changed requirement progress (out)
5	Assign a requirement to a Developer	Project Manager	Assigned requirement (out)

Table 7.1 - Product Use Case (PUC) Summary Table

7c. Individual Product Use Cases

Designation: PUC-1

Name: View specific project information

Priority: 1

Description: The user logs into the system as a CEO or a Product Manager and views the *Information Overview page*.

Trigger event: The user wants to see the information of a specific project

Actor: CEO or Product Manager

Pre-condition: The user has logged into the system as CEO or Product Manager.

Post-condition: The *Information Overview page* is displayed on the user's computer screen providing information about the selected project.

Result: The user has gained knowledge about the project.

Main scenario:

1. The system displays the *Projects Overview page*

2. The user clicks on the View button on a project in the list
3. The system displays the *Information Overview page* in the “Information” tab.

Alternative scenario: none

Qualities:

- Responsiveness
- W-QR106

Designation: PUC-2

Name: Sort and filter projects

Priority: 3

Description: The user sorts and filters the projects by certain criteria.

Trigger event: The user wants to see a specific Project Manager’s project that is in progress.

Actor: CEO, Product Manager or Requirements Engineer.

Pre-condition: The user has logged into the system as CEO, Product Manager or Requirements Engineer.

Post-condition: The projects are sorted and filtered by the given criteria.

Main scenario:

1. The system displays the *Projects Overview page*.
2. The user chooses “In progress” value from the “Filter” drop down list.
3. The system displays all the projects that are in progress.
4. The user chooses “PM name” value from the “Sort by” drop down list.
5. The system displays list of projects in progress by their Project Manager name in alphabetical order.

Alternative scenario:

- 3a. There are no projects that are in progress so the list is empty

Qualities:

- W-QR102
- Responsiveness
- W-QR106

Designation: PUC-3

Name: Edit functional requirement

Priority: 3

Description: The user chooses a specific functional requirement on the *Requirements Overview page* and edits the requirement.

Trigger event: The user wants to edit a specific requirement

Actor: CEO, Product Manager, Project Manager or Requirements Engineer.

Precondition: The user is logged into the system as one of the following actors;

Administrator, CEO, Product Manager, Project Manager or Requirements Engineer, and enters the *Requirements Overview page*.

Postcondition: The change in the requirement made by the user is saved in the database. The user is redirected to the *Specific Requirement page*.

Main scenario:

1. The user clicks on a specific functional requirement on the *Requirements Overview page*.
2. The system displays the *Specific Requirement page*.
3. The user clicks on the Edit button.
4. The system displays the Functional Requirement page
5. The user makes the desired changes of the requirement and clicks on the Submit button.
6. The system saves the change in the database.
7. The system displays the *Specific Requirement page* with updated values.

Alternative scenario: none

Qualities:

- Responsiveness
- W-QR106

Designation: PUC-4

Name: Increase progress of a requirement

Priority: 3

Description: The Developer logs into the system and increases progress of the requirement that he is implementing.

Trigger event: The Developer wants to add progress to the progress bar of the requirement

Actor: Developer

Precondition: The user of the system is a Developer with an assigned requirement who has logged in.

Postcondition: The progress of the requirement is increased by 5 % units.

Main scenario:

1. The system displays the *Specific Requirement page*.
2. The user clicks on the up arrow button on the numeric stepper
3. The value of the progress bar is increased by 5 units

Alternative scenario:

- 3a. If the progress is already at 100 % then nothing happens.

Qualities:

- Responsiveness
- W-QR106

Designation: PUC-5**Name:** Assign a requirement to a Developer.**Priority:** 3**Description:** The user logs into the system as Project Manager.**Trigger event:** The user wants to assign specific requirement to a Developer.**Actor:** Project Manager**Precondition:** The user has logged into the system as Project Manager.**Postcondition:** The user is directed to the *Specific Requirement page* with value of the Developer attribute is updated with Developer's name.**Main scenario:**

1. The system displays the *Information Overview page*.
2. The user clicks on the Requirements tab.
3. The system displays the Requirements Overview page.
4. The user clicks on the View button from a specific requirement.
5. The system displays the *Specific Requirement page*.
6. The user clicks on the Edit button.
7. The system displays Functional Requirements page.
8. The user clicks on the assign button.
9. The system displays pop up window which has list of names of the project members.
10. The user clicks on the specific name and confirms the choice.
11. The system displays the *Specific Requirement page* with value of the Developer tag is updated with the assigned Developer name.

Alternative scenario:

- 9a. If there are no Developers available the list will not contain any names.

Qualities:

- Responsiveness
- W-QR106

8. Functional and Data Requirements

8a. Functional Requirements

General functional requirements

ID: W-FR001

Title: Top bar

Precondition: The User is logged in.

Postcondition: N/A

Description: The system shall display a top bar at each and every one, except the *Login page*, of the pages of the web application. This bar shall contain a "Logout" button, a "Search" field and a welcome message indicating that the user is logged in to the web application.

Rationale: There should be some information that is displayed on each subpage of the website.

Dependencies: N/A

Priority: 2-more is better

ID: W-FR002

Title: Log out from the web application

Precondition: The user is logged in to the web application.

Postcondition: The user is not logged in to the web application.

Description: By clicking the "logout" button the user shall be logged out from the web application.

Rationale: The user wants to be able to log out of the system.

Dependencies: W-FR101

Priority: 2-more is better

ID: W-FR003

Title: Search function

Precondition: The user is logged in to the web application.

Postcondition: The user is presented with the retrieved data from the search.

Description: By start typing in the search field the system will act as a live search function providing the user with suggestions for the search. When the user is satisfied with the search string the system shall retrieve and present the desired data from the database.

Rationale: The user should be able to search for information on the page.

Dependencies: W-FR001

Priority: 2-more is better

ID: W-FR004

Title: Sort or Filter option

Precondition: The user is logged in to the web application.

Postcondition: The user is presented with the sorted or filtered objects (Projects, Requirements, Team members).

Description: By choosing one of the available sorting or filtering options from the different list-boxes the user shall be presented with the objects (Projects, Requirements, Team members) matching the filter option or the objects

(Projects, Requirements, Team members) sorted in the desired way.

Rationale: The user may want to sort or filter the objects on a page.

Dependencies: W-FR001

Priority: 2-more is better

Page 1 - Login page

ID: W-FR101

Title: Login to web application

Precondition: The user has accessed the *Login page*.

Postcondition: The user is logged in to the web application.

Description: By logging in to the web application with valid credentials (username + password) the system shall, dependent on the users role, direct the user to the correct page. The CEO or the Product Manager will be directed to the *Projects Overview page*. The Project Manager or the Requirements Engineer will be directed to their current project at the *Information Overview page*. The Developer will be brought directly to his specific requirement at the *Specific Requirement page*, and the Administrator will be brought to the *Administrative page*

Rationale: Every authorized user shall be able to login to the web application and in order to speed up the workflow they want to be directed to the best possible page for their task of the project.

Dependencies: -

Priority: 3-must

ID: W-FR102

Title: Retrieve password

Precondition: The user clicks the "Password Help?" link.

Postcondition: An email is sent to the user containing a new password.

Description: By clicking the "Password Help?" link the user will be able to type in his email. The system shall send an auto created password to his email.

Rationale: If the user forgets his password he wants to be able to retrieve it.

Dependencies: -

Priority: 3- must

ID: W-FR103

Title: Change font size in the web application

Precondition: The user clicks on one of the three (3) different font sizes, illustrated with 'A's.

Postcondition: The system changes the font size for the web applications text.

Description: By clicking on one of the three (3) font sizes the system shall adjust to the user's desire by changing the font size.

Rationale: The user may want to change the font size for the web application.

Dependencies: -

Priority: 2 – better to be

Page 2 - Projects overview

ID: W-FR201

Title: View projects

Precondition: The CEO or the Product Manager is, after login, directed to the *Projects Overview page*.

Postcondition: N/A

Description: By accessing the *Projects Overview page* the CEO or the Product Manager is presented with all projects related to them. The projects are listed with information about ID, name, start date, deadline, Project Manager in charge of project and progress.

Rationale: The CEO or the Product Manager wants an overview of the projects connected to them.

Dependencies: W-FR101

Priority: 3-must

ID: W-FR202

Title: View more information about a project

Precondition: The user clicks the “View” button.

Postcondition: The user is transferred to the *Information Overview page* of that certain project.

Description: By clicking the “View” button the user shall be transferred to the *Information Overview page* of that certain project.

Rationale: The information presented in the project overview may be insufficient to the user and he wants to know more about the project.

Dependencies: W-FR101

Priority: 2- better to be

Page 3 - Information about the project

ID: W-FR301

Title: Access information about a specific project

Precondition: The user has accessed the *Information Overview page* for a specific project.

Post-condition: The user is presented with an overview of the *Information Overview page*.

Description: This page can be accessed from two different pages. A Project Manager automatically accesses the *Information Overview page* after logging in. A Product Manager or CEO will access this page through the *Projects Overview page*.

Rationale: In order for an authorized user to get more detail about the specific project

Dependencies: W-FR202

Priority: 3-must

ID: W-FR302

Title: View the project information

Precondition: The user has entered the *Information Overview page*.

Postcondition: The user is presented with the information regarding the

specific project as shown on the *Information Overview* page.

Description: By clicking the first tab labeled 'Information', the system shall show the information of the specific project for the user.

Rationale: The user may want to gain extra information about the certain project.

Dependencies: W-FR301

Priority: 3-must

ID: W-FR303

Title: Edit project information

Precondition: The user clicks the "Edit" button at the *Information Overview* page.

Postcondition: The information has been updated.

Description: By clicking the "Edit" button the user can edit all the project information. By clicking the "Save" button the added/modified information will be saved and updated at the page.

Rationale: A user may want to modify the information regarding the specific project.

Dependencies: W-FR302

Priority: 2-better to be

ID: W-FR304

Title: Delete a specific project

Precondition: The user clicks the "Delete" button.

Postcondition: The specific project is deleted from the system after the user has verified his decision.

Description: By clicking the "Delete" button, the project will be deleted from the database, before this the user is asked to verify his choice.

Rationale: In order for a user to delete the specific project

Dependencies: W-FR302

Priority: 2-better to be

ID: W-FR305

Title: Information regarding related projects

Precondition: One project has been deleted or changed

Postcondition: The related projects are highlighted to distinguish them from the rest.

Description: By edit a projects information or by deleting a project, the system shall inform the user if there are relating projects which will be affected by this change.

Rationale: If a user change for example the deadline for a project then he want to be informed if this affects any other project which he may need to look at.

Dependencies: W-FR303

Priority: 2-better to be

ID: W-FR306

Title: Search by keywords

Precondition: The project has been assigned a number of keywords.

Postcondition: N/A

Description: The system shall allow the user to search the different projects by

the key words at the *Information Overview page*.

Rationale: A Product Manager or a CEO may want to search the different projects using a certain keyword.

Dependencies: W-FR301

Priority: 1-delight

Page 4 - Requirements for the specific project

ID: W-FR401

Title: Access the *Requirements Overview page*

Precondition: The user has clicked the “Requirements”-tab.

Postcondition: The user is presented with the *Requirements Overview page*.

Description: By accessing the *Requirements Overview page* the user is presented with all requirements in a certain project. The requirements are listed with information about ID, Title, Start time, End time, Developer and progress.

Rationale: The user wants an overview of the requirements connected to the certain project.

Dependencies: W-FR204

Priority: 3-must

ID: W-FR402

Title: Add, select and delete requirements

Precondition: The user has clicked one of the available choices

Postcondition: The user entered into requirement overview page

Description: The requirement overview page shall let the user add new requirements to the list of requirements, by pressing a button with the text “Add new req.”. The page shall let the user select multiple requirements by pressing checkboxes displayed on each requirement in the list. The page shall let the user delete selected requirements by pressing a button with the text “Delete selected”. When the delete button is pressed there shall be a popup window displayed which asks for confirmation about deleting the selected requirements.

Rationale: The Requirements Engineer and the Project Manager should be able to manage the list of requirements

Dependencies: W-FR401

Priority: 2-better to be

ID: W-FR403

Title: Assign Developer to requirements

Precondition: The user has chosen a certain requirement to be assigned.

Postcondition: A Developer has been assigned to a specific requirement

Description: The user shall be able to assign one Developer to each requirement by pressing a button with the text “Assign”. A list will pop up to let the user search a name of the available Developers.

Rationale: The Project Manager should be able to assign available Developers to requirements.

Dependencies: W-FR401

Priority: 3-must

Page 5 - Team members

ID: W-FR501

Title: Access the *Team Members page*

Precondition: The user has clicked the “Team members” tab.

Postcondition: The user is presented with the *Team Members page*.

Description: By clicking on the third tab labelled “Team members” the user will be presented with an overview of the team members for a certain project. He shall see them organized in a list, ordered hierarchically in a descending order by Product Manager, Project Manager, Developers and Requirements Engineers.

Rationale: In order for a user to assign new requirements to Developers or just get an overview of the members of the certain project the team members of this project must be shown.

Dependencies: W-FR301

Priority: 3-must

ID: W-FR502

Title: Information shown about team members.

Precondition: The user has clicked the “Team members” tab.

Postcondition: n/a

Description: The personal information about a user shall consist of: “Name” (First name and last name), “email and phone” (work email along with work phone number), “Role” (the members role in the project, Product Manager, Project Manager, Developer or Requirements Engineer). If the team member is a Developer then additional information will be shown consisting of: Assigned requirement and progress of that requirement.

Rationale: A user may want to be able to contact one team member and see the assigned requirement and the progress of that.

Dependencies: W-FR501

Priority: 1-delight

ID: W-FR503

Title: Information shown about a Developer’s requirement

Precondition: The Developer has been assigned a requirement which he is currently working on

Description: The information about the certain requirement which a certain Developer is currently working on shall consist of: the “ID”-tag, the “Title”-tag of the requirement, the “progress indication” label indicating the progress of the requirement and the “delete” button. This progress indication shall be the percentage of the completion of the requirement.

Rationale: A user want to be able to see what the certain Developer is working on and how far he has gotten on the implementation of the certain requirement.

Dependencies: W-FR501

Priority: 3-must

ID: W-FR504

Title: Information shown about a Developer’s requirement if he has not received one

Precondition: The Developer has not been assigned a requirement

Description: If the Developer has not yet been assigned a requirement from an authorized user there shall be an “Assign requirement” button in the “Requirement” area of the Developers information. By clicking this button the authorized user will be able to assign one requirement to that Developer by choosing from a list of available requirements.

Rationale: If a Developer has not yet received a requirement, an authorized user wants to be able to see this and assign one.

Dependencies: W-FR501

Priority: 3-must

ID: W-FR505

Title: Unassign requirement.

Precondition: The Developer has received a requirement.

Postcondition: The Developer has no longer one requirement assigned to him.

Description: By clicking the “Unassign” button for the certain Developer’s requirement the authorized user shall be able to unassign the requirement, before it will be unassigned there will appear a verification dialogue to the authorized user.

Rationale: The authorized user wants to be able to unassign a requirement which is assigned to a certain Developer.

Dependencies: W-FR504.

Priority: 2-better to be

ID: W-FR506

Title: Informing Developer of change

Precondition: The user has assigned or unassigned a certain requirement to the certain Developer.

Postcondition: The Developer is sent an automatic email from the system.

Description: When a user assigns or unassigns a requirement for a certain Developer the system shall automatically send an email informing the Developer about this.

Rationale: A Developer may want quick information about the fact that he has been assigned a requirement.

Dependencies: W-FR504 or W-FR505

Priority: 3-must

Page 6 - Specific Requirements

ID: W-FR601

Title: Access the *Specific Requirement page*

Precondition: The Developer has logged in. The CEO, Product Manager, Project Manager, Requirements Engineer has entered the *Requirements Overview page*.

Postcondition: The information of a certain requirement is displayed for the user.

Description: By accessing the *Specific Requirement page* the user will be presented with additional information about a certain requirement.

Rationale: User wants to view a specific requirement in order to gain further knowledge about this requirement.

Dependencies: -

Priority: 3-must

ID: W-FR602

Title: Increase and decrease progress of a requirement

Precondition: A Developer clicks either the up or down button beside the progress bar.

Postcondition: The value of progress is decreased or increased in both the *Specific Requirement page* and the *Requirements Overview page*.

Description: A Developer shall increase or decrease the value of progress by 5%-units when clicking up or down arrows on the numeric stepper beside the progress bar. The progress shall also be changeable through directly typing in the desired progress in the value box.

Rationale: User wants to change progress of a specific requirement.

Dependencies: W-FR601

Priority: 3-must

ID: W-FR603

Title: Progress bar reaches 100 %

Precondition: The requirement has been increased to 100 %.

Postcondition: The requirements finish date is set to the actual date, email and notification is sent to the Project Manager.

Description: By the Developer increasing the requirements progress to 100 % the system shall type the current date in the finish date of the requirement and send an email and a notification to the Project Manager informing him that the requirement has been fully implemented.

Rationale: The Project Manager wants to be informed if the Developer finishes a requirement; to get an overview the users wants to see a correct finish date.

Dependencies: W-FR602

Priority: 3-must

ID: W-FR604

Title: Edit and delete a requirement

Precondition: An Administrator, CEO, Product Manager, Project Manager or Requirements Engineer has entered into *Specific Requirement page*

Postcondition: The current requirement has been changed or deleted from the requirements database.

Description: This page shall allow the user to delete or edit a certain requirement by clicking the 'Delete' or 'Edit' button. The user will be asked to verify his choice before deleting this requirement from the database.

Rationale: User wants to delete a specific requirement

Dependencies: W-FR601

Priority: 3-must

Page 7 - Requirement template pages

ID: W-FR700

Title: Add new requirement

Precondition: The user has clicked the "Add new req." button at the

Requirement Overview page.

Postcondition: The user is presented with the *Functional Requirement page*.

Description: By accessing the *Functional Requirement page* the user shall be able to add a new requirement by first filling in all the necessary fields of the empty template and then click the "Submit" button. The system shall control that all the requirement fields are filled in before the requirement is added to the database.

Rationale: The user may want to be able to add a new requirement for the system.

Dependencies: W-FR402

Priority: 3 - must

ID: W-FR701

Title: Edit a requirement

Precondition: The user has clicked the "Edit" button at the *Specific Requirement page*.

Postcondition: The requirement is submitted and available to be assigned.

Description: By clicking the "Edit" button at the *Specific Requirement page* the user will be presented with the certain requirements template. The user is now able to modify the existing fields of the template and the changes will be sent to the database and updated when the user clicks the "Submit" button at the "Requirement template page".

Rationale: The user may want to be able to edit an added requirement.

Dependencies: W-FR700

Priority: 3 - must

ID: W-FR702

Title: Assign a requirement to a Developer

Precondition: The user has clicked the "Assign" button at the *Functional Requirement page*

Postcondition: The requirement is submitted and available to be assigned.

Description: By clicking the "Assign" button at the *Functional Requirement page* the user is presented with the list of available Developers. By choosing one of these Developers and clicking "Assign" the certain requirement shall be assigned to the Developer.

Rationale: The user may want to assign a Developer to a requirement.

Dependencies: W-FR700

Priority: 3 - must

ID: W-FR703

Title: Access the Quality requirement template

Precondition: The user has clicked the "Quality Requirement" item at the list-box at the "Requirement template page".

Postcondition: The user is presented with the template for the quality requirements.

Description: By clicking the "Quality Requirement" item at the list-box at the *Functional Requirement page* the user shall be presented with the template for quality requirements at the *Quality Requirement page*. The options regarding assign and submit will have the same functionalities as for the functional

requirements.

Rationale: The user wants to be able to add and edit both functional and quality requirements.

Dependencies: W-FR701

Priority: 3 - must

Page 8 - Admin page

ID: W-FR800

Title: Accessing the *Administrative page*

Precondition: The user has logged in as an Administrator and is presented with the *Administrative page*.

Postcondition: N/A.

Description: By logging in as an Administrator the user shall gain access to the *Administrative page* where he can manage the different projects and create new projects. The *Administrative page* shall be an extension of the *Project Overview*, the Filter and Sort options shall be the same for these pages.

Rationale: In order to manage the projects and its members in an efficient way there shall be an Administrator with authority to make the desired changes.

Dependencies: W-FR101

Priority: 3 - must

ID: W-FR801

Title: Adding projects

Precondition: The Administrator has accessed the *Administrative page*.

Postcondition: A new project has been added to the list of existing projects.

Description: By clicking the “Add project” button the Administrator shall be able to add an empty project.

Rationale: In case of new projects, they should be added to the list of projects.

Dependencies: W-FR800

Priority: 3 - must

ID: W-FR802

Title: Delete projects

Precondition: The Administrator has selected a number of projects which he wants to delete and has clicked the “Delete selected project(s)” button.

Postcondition: The selected project(s) are removed.

Description: By clicking the “Delete selected project(s)” button after the Administrator has checked a number of projects the selected projects shall be removed and no longer visible at the *Projects Overview page*. A warning shall be displayed before the projects are removed.

Rationale: The Administrator may want to delete a couple of projects if these are not needed anymore.

Dependencies: W-FR800

Priority: 3 - must

ID: W-FR803

Title: Archive projects

Precondition: The Administrator has selected a number of projects which he wants to archive and has clicked the “Archive selected project(s)” button.

Postcondition: The selected project(s) are archived.

Description: By clicking the “Archive selected project(s)” button after the Administrator has checked a number of projects, these shall be archived and no longer visible at the *Projects Overview page*. A verification dialogue shall be displayed before the projects are moved.

Rationale: The Administrator may want to delete a couple of projects if these are not needed anymore.

Dependencies: W-FR800

Priority: 3 - must

ID: W-FR806

Title: Add a team member to the project

Precondition: The Administrator has clicked the “Add” radio-button and chose one employee which he wants to add to the project.

Postcondition: The certain employee is assigned to the project.

Description: By clicking the “Add” radio-button the available employees will be presented in the “Name (Role)” drop-down-list. When an Administrator chooses one of these he will be added to the project after the Administrator has verified it.

Rationale: The system must allow a user to add a new team member to a project.

Dependencies: W-FR800

Priority: 3 - must

ID: W-FR807

Title: Delete a team member from the project

Precondition: The Administrator has clicked the “Delete” radio-button and chose one employee which he wants to remove from the project.

Postcondition: The certain employee is removed from the project.

Description: By clicking the “Delete” radio-button the current team members will be presented in the “Name (Role)” drop-down-list. When an Administrator chooses one of these he will be removed from the project after the Administrator has verified it.

Rationale: The system must allow a user to remove current new team members of a project.

Dependencies: W-FR806

Priority: 3 - must

Mobile application

ID: M-FR100

Title: Login

Precondition: The user has installed the application and is at the *Login page*.

Postcondition: The user is logged in to the system. A CEO or a Product Manager will be presented with the *Projects Overview - Mobile page* and the Project Manager will be presented with the *Information Overview page* for his specific project. It shall not possible to save the users password.

Description: By providing the correct user credentials on the login screen and clicking the “login” button the user shall be logged in to the system and directed

to the correct page.

Rationale: In order to use the mobile application the authorized user first needs to be logged in and verified as an authorized user.

Dependencies: -

Priority: 3- must

ID: M-FR101

Title: Choose a project from the *Projects Overview - Mobile page*

Precondition: The user is at the *Projects Overview - Mobile page*.

Postcondition: The user has entered a specific project and is at the *Information Overview - Mobile page*.

Description: By clicking one of the available projects on the *Projects Overview - Mobile page* the user will gain access to that project. The available projects at the *Projects Overview - Mobile page* will provide the user with information regarding name and progress about the specific project.

Rationale: To be able to choose a certain project.

Dependencies: M-FR100

Priority: 3- must

ID: M-FR102

Title: View information about a specific project.

Precondition: The Product Manager or the CEO has chosen a project from the list of available projects, or a Project Manager has logged in.

Postcondition: The user is presented with information regarding the project at the *Information Overview - Mobile page*.

Description: By accessing a project the user shall be presented with information about the regarding project.

Rationale: In order to get a deeper understanding for the user about a certain project, there is additional information in the "Information" tab.

Dependencies: M-FR101

Priority: 3- must

ID: M-FR103

Title: View all the requirements of a certain project.

Precondition: The user has accessed the *Requirements Overview - Mobile page*.

Postcondition: The user is presented with information about all the requirements for the project.

Description: By accessing the *Requirements Overview - Mobile page*, either by swipe to the "Requirements"-tab or clicked the "Requirement"-tab, the user shall gain an overview of all the requirements in the project. Requirements shall be distinguished by "ID"-tag + "Title"-tag and shall have a progress indicator, indicating the development progress.

Rationale: In order for a user to get an overview of how the Developers are doing with the implementation.

Dependencies: M-FR101

Priority: 3- must

ID: M-FR104

Title: View information about team members

Precondition: The user has accessed the “Team members - Mobile” page.

Postcondition: The user is presented with information about all the team members for the project.

Description: By accessing the *Team members - Mobile page*, either by swipe to the “Team members”-tab or clicked the “Team members”-tab, the user shall gain an overview of all the team members in the project. The team members shall be ordered the same way as in the web application, W-FR501. A Developer shall have a requirement label if he has a assigned requirement, same as the web application, W-FR503, if he does not have a requirement assigned there shall be a label indicating this.

Rationale: In order for the user to gain an overview of the team members for a certain project.

Dependencies: M-FR101

Priority: 3- must

ID: M-FR106

Title: Notification from Developer.

Precondition: The Developer has completed a requirement.

Postcondition: The Project Manager is sent a notification which appears in his notification bar.

Description: By a Developer’s verification that specific requirement is fully implemented an automatic notification will be sent to the concerned Project Manager. This notification will appear in the Project Manager’s *Notification bar* with information about the requirement and who completed it.

Rationale: In order for a Project Manager to have get an instant notification about the completion of a requirement, wherever he is.

Dependencies: M-FR100, W-FR601

Priority: 1- delight

ID: M-FR107

Title: Access the *Requirements Overview - Mobile page* through the notification

Precondition: The Project Manager clicks a notification in his *Notification bar*.

Postcondition: The Project Manager is brought to the *Requirements Overview - Mobile page* for the certain project.

Description: By clicking the notification in the *Notification bar* the Project Manager is brought to the login page. After he has logged in he is brought directly to the *Requirements Overview - Mobile page* for his project, where he will see the finished requirement.

Rationale: The Project Manager may want to have direct access to the *Requirements Overview - Mobile page* page when he receives a notification.

Dependencies: M-FR100, M-FR106

Priority: 1-delight

ID: M-FR508

Title: Sorting

Precondition: The user has chosen a certain sort option from the “Sort”-box on one of the pages in the mobile application.

Postcondition: The objects (Projects, Requirements or Team members) are sorted in the desired way.

Description: By choosing one of the existing sorting options the system will sort

the objects (Projects, Requirements or Team members) according to the user's desire.

Rationale: The authorized user may want to gain a quick and efficient overview of his team members.

Dependencies: M-FR100, (M-FR101 or M-FR103 or M-FR104)

Priority: 2-better to be

ID: M-FR509

Title: Filtering

Precondition: The user has chosen a certain filtering option from the "Filter"-box

Postcondition: The concerned objects (Projects, Requirements or Team members) with the certain filtered attributes are still visible and the other objects (Projects, Requirements or Team members) without the certain filtered attributes are not visible at the page.

Description: By choosing one of the existing filtering options The concerned objects (Projects, Requirements or Team members) with the certain filtered attributes are still visible and the other objects (Projects, Requirements or Team members) without the certain filtered attributes are not visible at the page.

Rationale: If a user wants an efficient way of seeing an overview of objects (Projects, Requirements or Team members).

Dependencies: M-FR100, (M-FR101 or M-FR103 or M-FR104)

Priority: 2-better to be

ID: M-FR110

Title: Search function

Precondition: The user has accessed the search field.

Postcondition: The user is presented with the result from his search.

Description: By start typing in the search field the system will act as a live search function providing the user with suggestions for the search. When the user is satisfied with the search string the system shall retrieve and present the desired data from the database.

Rationale: The small screen gives bad overview and the user might want to find a specific project/requirement.

Dependencies: M-FR100

Priority: 3-must

ID: M-FR111

Title: Log out of the application

Precondition: The user is logged in to the mobile application.

Postcondition: The user is no longer logged in to the mobile application.

Description: By clicking the "logout" button on any of the existing pages in the mobile application the user shall be logged out of the mobile application. If a Project Manager is logged out, he shall not receive any notifications.

Rationale: In order to prevent intrusion in the system the user wants to logout from the mobile application.

Dependencies: M-FR100

Priority: 3-must

Non-functional Requirements

9. Look and Feel Requirements

9a. Appearance Requirements

ID: MW-QR000

Title: System Appearance

Precondition: N/A

Postcondition: N/A

Description: The system shall have a glossy look.

Rationale: The CEO likes apples design.

Dependencies: none

Priority: 2-better to be

9b. Style Requirements

TAG: Concise and Elegant

GIST: Attractive and professional for the users

SCALE: Number of users who like the appearance

METER: Measurement on 100 employees in the company

MUST: >50% respondents like it

PLAN: >75% respondents like it

WISH: 100% respondents like it

10. Usability and Humanity Requirements

10a. Ease of Use Requirements

ID: W-QR100

Title: Resolving naming conflicts

Precondition: The user has tried to create a project or a requirement with an existing "Name"-tag or "ID"-tag.

Postcondition: The project or the requirement is not created and the user is presented with a warning dialogue.

Description: The system shall never allow a user to add a project or a requirement with the same “name”-tag or “ID”-tag as an existing project or requirement the system.

Rationale: In order to avoid any mistakes with doublets in the database.

Dependencies: W-FR801 or W-FR700

Priority: 3 - must

ID: M-QR002

Title: Increase efficiency

Description: The mobile application shall increase the efficiency of a Project Manager’s daily work by providing instant notification when a Developer has finished a requirement.

Rationale: By increasing the efficiency of the Project Manager’s work the efficiency of the whole project will increase.

Dependencies: M-FR106

Priority: 3- must be

10c. Learning Requirements

TAG: Learnability - Assign

GIST: Ease to assign a requirement to a certain Developer.

SCALE: Time for a novice authorized user to access a certain project and add a certain requirement to an existing Developer.

METER: Measurement on 20 *Novice users* during UI-testing.

MUST: <3 minutes 80 % of the time.

PLAN: <2 minutes 90 % of the time.

WISH: <1 minutes 100 % of the time.

TAG: Learnability - Unassign

GIST: Ease to unassign a requirement for a certain Developer.

SCALE: Time for a *Novice user* to access a certain project and unassign a certain requirement for a Developer.

METER: Measurement on 20 novice authorized users during UI-testing.

MUST: <3 minutes 80 % of the time.

PLAN: <2 minutes 90 % of the time.

WISH: <1 minutes 100 % of the time.

Tag: Learnability - Mobile

Gist: Ease to use the mobile application

Scale: Time for a *Novice user* of the mobile application to (after login) access a certain project, view the progress of a certain requirement at the “Requirements for project - Mobile” page and view a certain team member’s progress of one requirement at the “Team members - Mobile” page.

Meter: 20 authorized users during UI-testing.

Must: <2 minutes 90 % of the time.

Plan: <1 minute 90 % of the time.

Wish: <45 seconds 100 % of the time.

10e. Accessibility Requirements

ID: W-QR101

Title: Changing font size

Rationale: In order for the authorized users who have poor eyesight

Description: It shall be humanization for poor eyesight user to choose the suitable font size as big, medium or small at the "Login page".

Dependencies: -

Priority: 1-delight

11. Performance Requirements

11a. Speed and Latency Requirements

ID: W-QR102

Title: Time for Filtering and sorting

Description: It shall take a maximum of x seconds to sort or filter the requirements in the list on the *Requirements Overview page*, the team members on the *Team members page* and the projects on the *Projects Overview page*

Rationale: The Project Manager should be able to view all the relevant requirements as fast as possible so that his work flow is as fluent as possible.

Dependencies: W-FR004

Priority: 3 - must

Notes: x is in this case tdb

ID: W-QR103

Title: Time for Searching

Description: It shall take a maximum of x seconds to search for a project, a requirement and a team member with the search function.

Rationale: The user should be able to find things as fast as possible.

Dependencies: W-FR003

Priority: 3 - must

Notes: x is in this case tdb

ID: W-QR104

Title: Time for login

Description: It shall take a maximum of x seconds to enter the "Projects overview page", the "Specific requirement page" or the "Information page", after a user logs in from the "Login page".

Rationale: The user should be able to login as fast as possible so that time is not wasted when the user tries to log in.

Dependencies: W-FR101

Priority: 3 - must

Notes: x is in this case tdb

TAG: Responsiveness

GIST: Fastness of the system response time

SCALE: Time for the system to respond to user input

METER: Measurement on 100 user input during the UI testing

MUST: <1 second 90% of the time

PLAN: <0.5 second 90% of the time

WISH: <0.1 second 100% of the time

11d. Reliability and Availability Requirements

TAG: Availability

GIST: Availability of the system for its users

SCALE: Time of the availability of the system in one calendar year

METER: Measurement on the time the system is online under one calendar year

MUST: >98.5 % of the time

PLAN: >99.5 % of the time

WISH: 100 % of the time

11g. Scalability or Extensibility Requirements

ID: W-QR001

Title: Extendibility of the web application

Description: The web application shall be implemented as object oriented so that it is easily modified and extendable. Addition of new functionality and modification of existing functionality shall be made to the web application with minimum effort. The web application shall be able to handle 100 users at the same time, which may increase to 1000 within a next three years.

Rationale: The web application shall be easy modified in order to meet demands to meet the needs of growth in the company in the future these demands may consist of adding or re-doing certain functionalities of the web application.

Dependencies: -

Priority: 3 - must

ID: M-QR004

Title: Extendibility of the mobile application

Description: At the present, the mobile application is only for the viewing purpose. Within a three year period, it shall be possible to add more functionality to it, as well as re-doing the existing functionalities.

Rationale: The mobile application shall be easy modified in order to meet demands to meet the needs of growth in the company in the future these demands may consist of adding or re-doing certain functionalities of the mobile application.

Dependencies: -

Priority: 3 - must

12. Security Requirements

12a. Access Requirements

TAG: Security - not authorized

GIST: Not available for unauthorized users.

SCALE: Number of times a user can access the system without the authority to access the system.

METER: Measurement on 500 login attempts with incorrect credentials.

MUST: 0 times 100 % of the time

PLAN: 0 times 100 % of the time

WISH: 0 times 100 % of the time

ID: M-QR001

Title: Retrievable

Description: The mobile application shall only be available for download from the intranet if you are a CEO, a Product Manager or a Project Manager.

Rationale: The Developer or the Requirements Engineer has no use of the mobile application and shall therefore not have access to it.

Dependencies: -

Priority: 3 - must

ID: M-QR003

Title: Security

Description: The mobile application shall be secure, both in regard to unauthorized access and to security regarding the database. Therefore it shall not be possible to save the password in at the login screen or to in any way modify the database using the mobile application.

Rationale: In order to guarantee a secure application, these criteria must be met.

Dependencies: FR-M100, QR-M101

Priority: 3 - must

12b. Integrity Requirements

ID: M-QR100

Title: Inability to modify

Description: The user of the mobile application shall not be able in any way to modify or corrupt the data of the database; therefore the system shall not provide any possibility to do anything else but viewing information.

Rationale: The database shall not be able to be corrupted by a user of the mobile application.

Dependencies: -

Priority: 3-must

12e. Immunity Requirements

ID: W-QR106

Title: Recoverability of the web application

Description: The system shall be able to recover from software failure within a short time limit. System shall be able to recover the web page that user were working on it with the unsaved data.

Rationale: User wants to continue from the last session in case of system crash.

Dependencies: -

Priority: 3 - must

ID: M-QR005

Title: Recoverability of the mobile application

Description: The system shall be able to recover from software failure within a short time limit.

Rationale: User wants to continue from the last session in case of system crash.

Dependencies: -

Priority: 3 - must

13. Tasks

This section will describe the process of delivering the product to the customer. The prioritization of 10 important requirements is in Appendix II.

13a. Project Planning

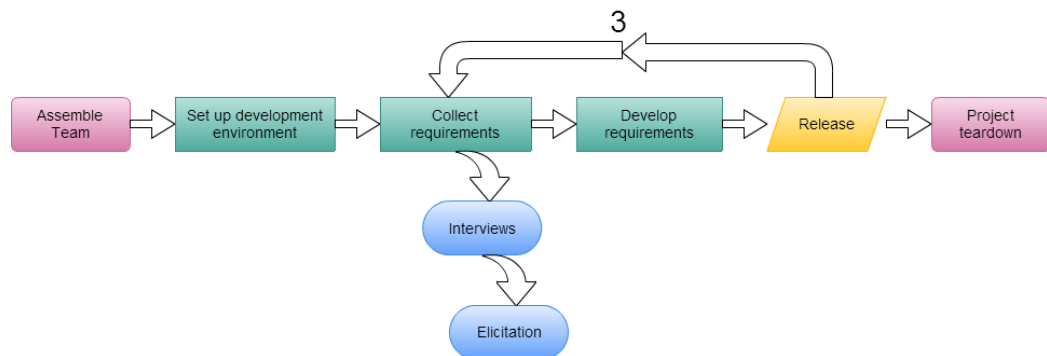


Figure 13.1.

13b. Planning of the Development Phases

According to Kano Model and the feedback of customer from the survey, the software will be developed and delivered in three releases. As shown in the chart below, the first phase leading to the first release is bigger than the other phases. More detailed information about which requirements should be in which release is presented below.

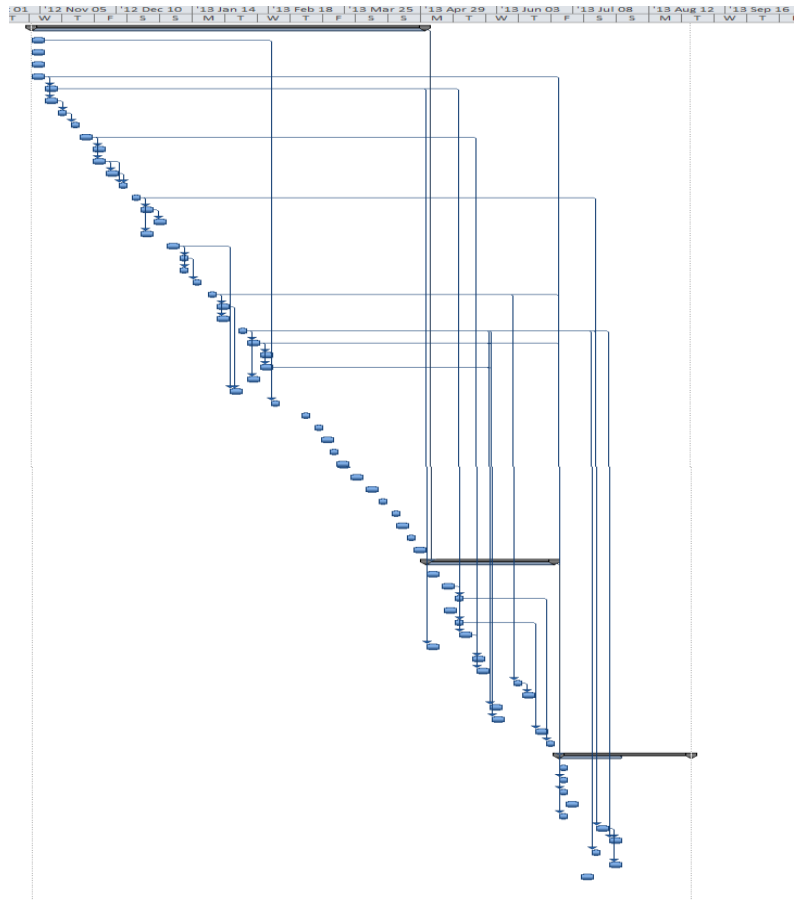


Figure 13.2 – Gantt chart

Release 1

ID of requirement	Name of requirement	Motivation
W-FR101	Login to web application	The user has to log in to the web application because of security reasons.
W-FR002	Log out from the web application	Same as W-FR101.
W-FR201	View projects	It is important for the Requirements Engineers to be able to see which project they will be adding requirements to.
W-FR301	Access information about a specific project	It is important for the Project Manager to be able to see the progress of his current project.
W-FR302	View the project information	Same as for W-FR301.
W-FR401	Access the Requirements Overview page	It is important for the Project Manager to get an overview of all the requirements for a specific project because he needs to be able to assign the requirements to Developers.
W-FR402	Add, select and delete requirements	The Requirements Engineers should be able to add new and/or delete faulty and requirements to a project.
W-FR403	Assign Developer to requirements	The Developers need to know what they shall be working on.
W-FR501	Access the <i>Team Members page</i>	The Project Manager should be able to see what the Developers are working on at the moment and determine when they should be assigned new requirements to implement.
W-FR502	Information shown about team members	The Project Managers should be able to determine the best suited Developer to implement a specific requirement.
W-FR504	Information about available Developers	It should be easy for the Project Manager to see all the Developers that are available so that he doesn't need to ask the Developers who is available and who is busy at the moment.

W-FR505	Unassign requirement	If a Developer doesn't think that he can implement the specific requirement or if he is sick, then the requirement should be assigned to another Developer.
W-FR506	Informing Developer of change	The Developer that is assigned to a requirement should be notified that he has work to do.
W-FR601	Access the Specific Requirement page	The Developer should be able to see what he is supposed to work on.
W-FR602	Increase and decrease progress of a requirement	It is important for the Project Manager to know the progress of the current work of the Developers so that he can plan for the next requirements that are to be assigned.
W-FR603	Progress bar reaches 100 %	Same as the W-FR602.
W-FR604	Delete and edit a requirement	It is important for the Requirements Engineers to be able to edit or delete requirements that are faulty in some way.
W-FR700	Add new requirement	Same as W-FR402.
W-FR701	Edit a requirement	Same as W-FR604.
W-FR702	Assign a requirement to a Developer	Same as W-FR403.
W-FR703	Access the Quality requirement template	The Requirements Engineer should be able to create Quality Requirements as well as functional requirements.
W-FR800	Accessing the <i>Administrative page</i>	It is important to be able to add new projects to the application. It is also important to add/delete team members to projects in case the company recruits new employees or old ones leave the company.
W-FR801	Adding projects	Same as W-FR801.
W-FR802	Delete projects	Same as W-FR801.

M-FR100	Login to mobile application	The user has to log in to the mobile application because of security reasons.
M-FR101	Choose a project from the <i>Projects Overview - Mobile</i>	It is important for the Product Manager to get an overview of the projects he is working on at the moment. This requirement was specifically requested by the CEO.
M-FR102	View information about a specific project	The mobile application should mirror the web application when it comes to viewing information.
M-FR103	View all the requirements of a certain project	The mobile application should mirror the web application when it comes to viewing information. Same as W-FR401.
M-FR111	Log out of the application	It is important for the user to be able to log out of the mobile application for security reasons.
W-QR100	Resolve naming conflicts	It is important that all the requirements have unique identifiers so that they do not get mixed up when the Project Manager is assigning them to Developers.
W-QR104	Time for login	It is important that the time to login to the web application is not too long. This will increase the usability of the application significantly.
W-QR001	Extendibility of the web application	It is important that the web application is extendable for future releases and updates.
W-QR106	Recoverability of the web application	In case of failures it is important that explicitly unsaved data is not lost.
Availability		It is important that the system is available as often as possible so that the company can continue to work.
Learnability - Assign		Since assigning Developers is going to be in the first release it is important that it is made easy to learn right away.
Learnability - Unassign		Since assigning Developers is going to be in the first release it is important that it is made easy to learn right away.
Security - Unauthorized		Same as above (Learnability - Unassign).

Responsiveness		It is important that the functionality that is going to be implemented in the first release responds quickly to user input since if it is going to be extended in the future you do not want to change functionality that is already implemented.
Learnability (Mobile)		It is important for the mobile application to be easy to learn so that employees will have reasons to use it instead of the web application for viewing.
M-QR100	Inability to modify	It is important that the mobile application does not modify any data in the database. This is important for security reasons.
Security - not authorized		This requirement is important for security reasons.
M-QR005	Recoverability of the mobile application	This is important for security and recoverability reasons.
M-QR004	Extendibility of the mobile application	Since this quality requirement shall be followed in the whole development process.

Release 2

ID of requirement	Name of requirement	Motivation
MW-QR000	System Appearance	The appearance of the system will be implemented after feedback from the rest of the employees of the company.
W-FR001	Top bar	The top bar is about appearance and will therefore be implemented in the second release.
W-FR003	Search function	The search function is not a functionality that the CEO requested.
W-FR102	Retrieve password	This feature was not requested by the CEO.
W-FR004	Sorting/Filtering objects (Projects, Requirements,	The sort and filter functions are not something that the CEO requested.

	Team members)	
W-FR303	Edit project information	It is assumed to be not so likely that information about project can change in the middle of projects; hence this is implemented in the second release.
W-FR304	Delete a specific project	It is assumed that most of the projects that are started are also finished; hence this is implemented in the second release.
W-FR305	Information regarding related projects	This function was not requested by the CEO and will therefore be added as a future feature in the second release.
W-FR503	Information shown about a Developer's requirement	This feature was not requested by the CEO.
W-FR806	Add a team member to the project	This function was not requested by the CEO and will therefore be added as a future feature in the second release.
W-FR807	Delete a team member from the project	This function was not requested by the CEO and will therefore be added as a future feature in the second release.
M-FR508	Sorting	This function was not requested by the CEO and will therefore be added as a future feature in the second release.
M-FR509	Filtering	This function was not requested by the CEO and will therefore be added as a future feature in the second release.
W-QR102	Time for Filtering and sorting	Since the functionality of sorting and filtering is added in the second release the quality requirements of sorting and filtering are also added in the second release.
W-QR103	Time for Searching	Since the functionality of searching is added in the second release the quality requirements of searching are also added in the second release.

Release 3

ID of requirement	Name of requirement	Motivation
W-FR103	Change font size in the web application	The employees are reported not to have any eyesight disabilities and this feature will be added in the third release.
W-FR306	Search by keywords	This feature was not requested by the CEO.
W-FR803	Archive projects	This feature was not requested by the CEO.
W-QR101	Changing font size	The functionality for changing font sizes is implemented in the third release, hence the quality requirements for changing font sizes will also be in the third release.
M-FR104	View information about team members	This feature was not requested by the CEO.
M-FR106	Notification from Developer	This feature was not requested by the CEO.
M-FR107	Access the <i>Requirements Overview - Mobile page</i> through the notification	This feature was not requested by the CEO.
M-FR110	Search function	This feature was not requested by the CEO.
Concise and Elegant		The functionality will be more important than the look and feel of the system, hence this is in the third release.
M-QR002	Increase efficiency	This is important for the whole existence of the mobile application since it is just an extension of the web application.

14. User Documentation and Training

14a. User Documentation Requirements

We will provide user documentation in form of:

- User manual for the web application
- User manual for the mobile application

The user manual for the web application will function as an aid for the users using the web application. Especially for users who encounters problems working with the web application. Using this documentation should provide the user with enough information to solve the most common issues which may arise using the web application. Every user with access to the web application should be able to retrieve the documentation from the Intranet. In the user manual the user shall be able to retrieve information regarding the functionalities of the web application. The user manual should be intended for the CEO, Product Engineers, Project Managers, Requirements Engineers and Developers. It is intended for the user manual to be updated with every new release or update of the web application, it is therefore preferable that the user manual is, as said, retrievable online.

The user manual for the mobile application will be slightly different from the web application's user manual. This manual will function as a tutorial the first time a user starts the mobile application. By following this tutorial the user shall gain an overview of the mobile application by the possibility to click next and to go back one step in the tutorial if something was unclear the first time. In addition to this function we will provide a basic manual inside the application as well, containing the basic information like the web application's user manual. Since this is completely delivered through the phone the users who will have access to it is the CEO, Product Manager and Project Manager. In case of a new release or update of the mobile application the help document should be updated and a release note explaining the new functions should be shown to the user on the first start up.

15. Ideas for Solutions

During the requirement elicitation we found a couple of ideas for the product which we did not really found to be in the scope, nor asked for by the customer. They are as followed:

- One idea is to provide the Product Manager, Project Manager and the CEO with the possibility to manage projects and team members in the respective pages rather than accessing these functionalities through an Administrative page. By implementing these functions we believe we could create a more efficient way of working.
- Allow Requirements Engineers to use the application as well, could be useful when they visit customers
- Using the mobile application for managing requirements as well, not just viewing.
- Developers could be able to be assigned to more than one requirement at a time. Can be assigned a list of requirements by the Project Managers at once.
- Developers could be able to automatically start unit tests from the web application.
- More options for exporting data could be added. For example possibilities to show burn down charts for the projects. A more effective estimation proposal for the requirements.

16. References

[1] Helen Sharp, Anthony Finkelstein & Galal Galal. "Stakeholder Identification in the Requirements Engineering Process". 11/12/99.

http://eprints.ucl.ac.uk/744/1/1.7_stake.pdf (5 October 2012)

[2] Joachim Karlsson, Kevin Ryan. "A Cost-Value Approach for Prioritizing Requirements". 1997. http://www.cse.chalmers.se/~feldt/courses/regeng/papers/karlsson_1997_cost_value_prioritization_of_requirements.pdf (16 October 2012)

[3] Elmar Sauerwein, Franz Bailom, Kurt Matzler & Hans H. Hinterhuber. "The Kano Model: How to delight your customers" 19/2/1996, pp313-327

Appendix

Appendix I

Fig 1. Login page

MoRe-Man

http://

MORE-MAN

IMAGNICORP

Our Web App

The web app aims...
Feature of our app
JAVASCRIPT ENABLED
BROWSERS IE 8/9, FireFox
and Chrome

Our Mobile App

The mob app aims...
Feature of our mob app
Android 2.0 +

Login to Your Account

Username(Tim_Kotnour)
Tim_Kornour Enter the Username

Password(6,include nums and letters)
***** Enter the Password

Invalid Username or Pasword

☐ Remember my password

[Password Help?](#)

[Cannot access your account?](#)

Login

Fig 2. Projects Overview page

MoRe-Man

http://

Welcome, Tim! Logout Search

Projects overview

Project connected to user

Filter: Finished, In progress, Not finished

Sort by: ID, Project name, PM name, Progress, Startdate

Project	Start date	Deadline	Progress	View
Project 1 Project Man: Sven Johansson	2012-07-26	2013-02-17	5%	View
Project 2 Project Man: Lotta Hage	2012-01-02	2012-07-26	100% (Done)	View
Project 3	2012-11-05	2013-07-28	0% (Not started)	View

Fig 3. Information Overview page

MoRe-Man

http://

Info Req Team Welcome, Tim! Logout search

Project ###

Name Progress **70% 142/200** Related Project

Project 001
Project 005
Project 007

Start Time Deadline

Expected Duration

Description

The Aim of the project

The Background of the project

The Summary of the project

Key Words Edit Save Delete

Fig 4. Requirements Overview page

MoRe-Man

http://

Info Req Team Welcome, Tim! Logout Search

Requirements for Project X

Add new req. Delete selected

Filter: Finished Not finished High priority Medium priority Low priority Assigned

Sort by: ID Req. name Dev. name Priority Progress Startdate Enddate

FR045: UI - Search function	Added: 2012-07-26 Deadline: 2012-07-27	Priority: priority	Assigned to: Michael Jasinski	Progress: 85% (In progress)	
FR182: DB - Persons table	Added: 2012-07-25 Deadline: 2012-07-26	Priority: L	Assigned to: Michael Jasinski	Progress: 100% (Done)	View
FR003: UI - Filter function	Added: 2012-07-27 Deadline: 2012-07-28	Priority: M	Assigned to: <input type="text"/>	Progress: 0% (Not started)	View

Fig 5. Team Members page

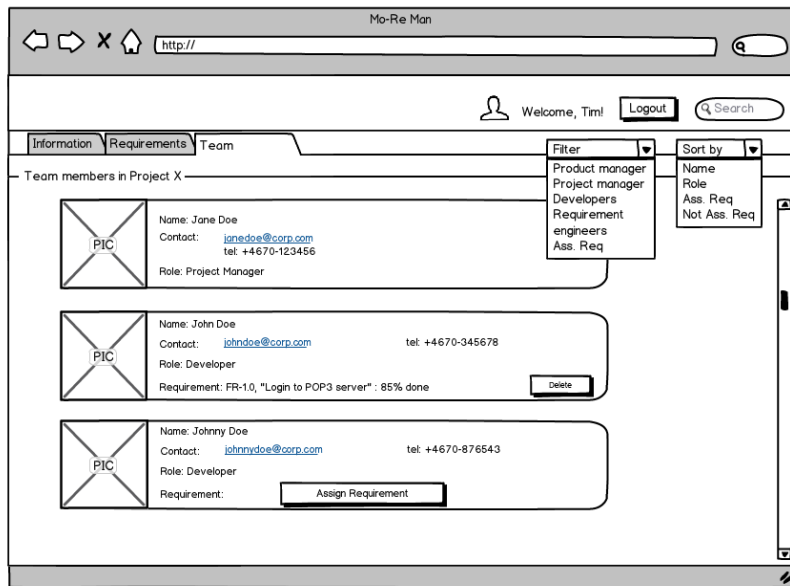


Fig 6. Specific Requirement page

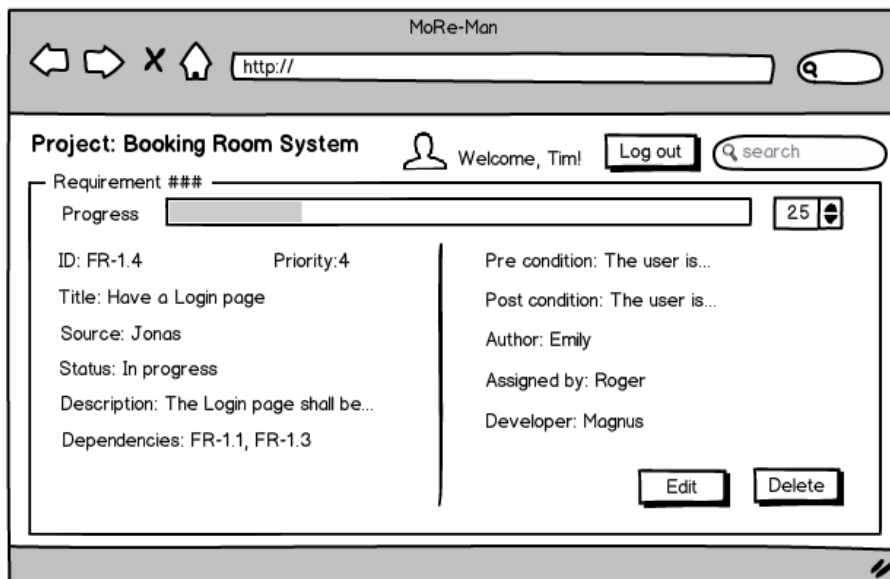


Fig 7. Functional Requirement page

Functional Requirement

Welcome, Mogrus Logout search

Requirement template Function Requirement

Unique ID FR- Forward traceability

Title Backward traceability

Project Dependencies

Priority 2

Pre condition

Post condition

Description

The system/user SHALL <process verb>

Assign Submit Cancel

Fig 8. Quality Requirement page

Functional Requirement

Welcome, Mogrus Logout search

Requirement template Quality Requirement

TAG QR- An unique identifier

GIST A simple description of the requirement

SCALE This scale of measure used to quantify the req

METER How to measure where on the scale a requirement is positioned

MUST The minimum level required to fulfil the requirement

PLAN The level of implementation where good success can be claimed

WISH The desired level of implementation

Assign Submit Cancel

Fig 9. Administrative page

MoRe-Man Admin

http://

Welcome, Tim! Logout Search

Administrator

Add project Delete selected project(s) Archive selected project(s) Filter In progress Sort by Project ID

Project 1	Start date: 2012-07-26 Deadline: 2013-02-17	View	Team member: Kevin Ryan (PM)
Project Man.: Sven Johansson	Progress: 5% (In progress)	<input checked="" type="radio"/> Add <input type="radio"/> Delete	Joachine (Dev) Davis (Dev)
Project 2	Start date: 2012-01-02 Deadline: 2012-07-26	View	Team member: Name(Role)
Project Man.: Lotta Hage	Progress: 100% (Done)	<input type="radio"/> Add <input type="radio"/> Delete	<input checked="" type="checkbox"/>
Project 3	Start date: 2012-11-05 Deadline: 2013-07-28	View	Team member: Name(Role)
Project Man.: B Surtis	Progress: 0% (Not started)	<input type="radio"/> Add <input type="radio"/> Delete	<input type="checkbox"/>
Project 4	Start date: 2013-5-05 Deadline: 2013-12-28	View	Team member: Name(Role)
Project Man.: TBD	Progress: 0% (Not Started)	<input type="radio"/> Add <input type="radio"/> Delete	<input checked="" type="checkbox"/>

Fig 10. Login screen – Mobile

ABC 3G 04:02 PM

MORE-MAN

Login to Your Account

Username
Tim_Kornour

Password

Login

[Password Help?](#)

Fig 11. Projects Overview page – Mobile

ABC 3G 02:16 PM

Welcome, Tim! Logout Search

Projects Overview - Projects connected to user

Sort by Filter

Project 1	Start date: 2012-07-26 Deadline: 2013-02-17	Progress: 5%
Project Manager: Sven Andersson		
Project 2	Start date: 2012-07-26 Deadline: 2013-02-17	Progress: 100% (done)
Project Manager: Anders Johansson		
Project 3	Start date: 2012-07-26 Deadline: 2013-02-17	Progress: 0% (not started)
Project Manager: Karin Svensson		

Specific Project

Specific Project

Fig 12. Information Overview page – Mobile

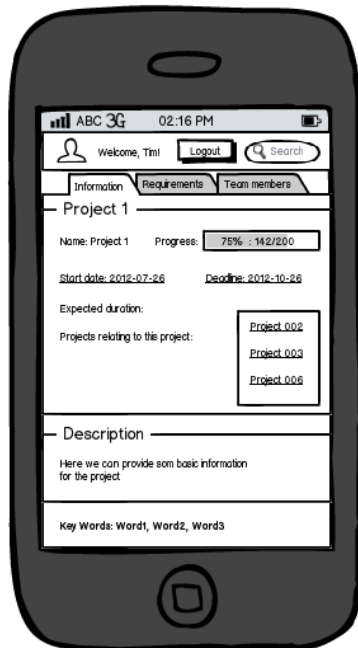


Fig 13. Requirements Overview page – Mobile

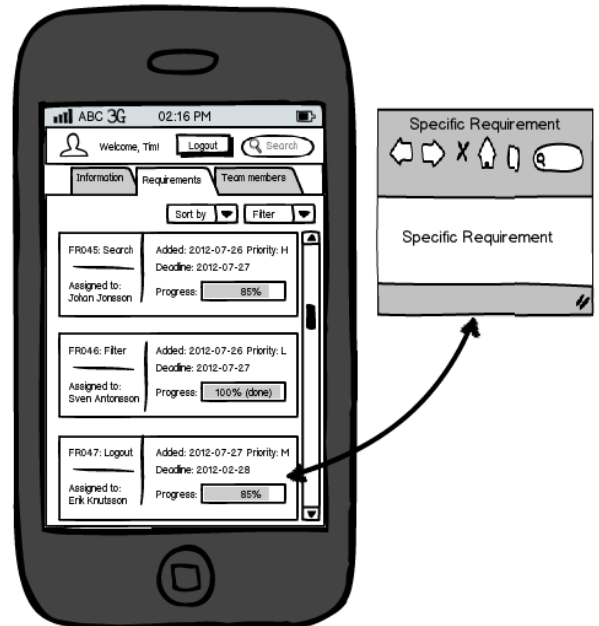


Fig 14. Team Members page – Mobile

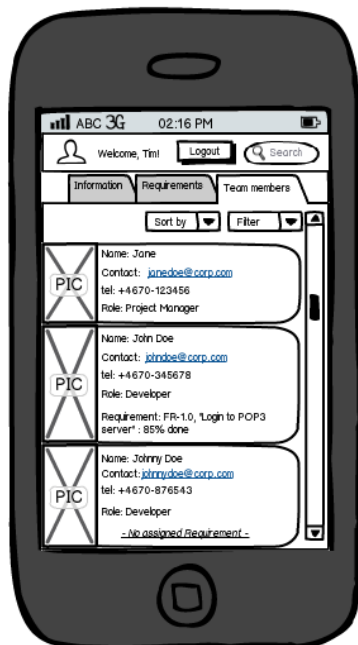
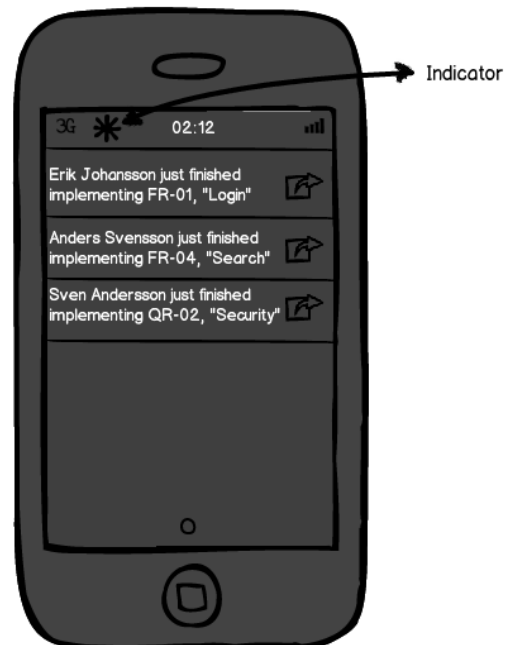


Fig 15. Notification bar – Mobile



Appendix II Prioritization of 10 important requirements by Cost-Value Approach

Req ID	Title
W-FR403	Assign Developer to requirements
W-FR504	Information about available Developers
W-FR602	Increase and decrease progress of a requirement
W-FR702	Edit a requirement
W-FR703	Assign a requirement to a Developer
M-FR103	View information about a specific project
W-QR100	Resolve naming conflicts
W-QR105	Extendibility of the web application
Learnability	Ease to assign a requirement to a certain Developer(Gist)
M-QR101	Retrievability-Download

Table 2.1 10 important requirements

Cost	W-FR403	W-FR504	W-FR602	W-FR702	W-FR703	M-FR103	W-QR100	W-QR105	Learnability	M-QR101
W-FR403	1	3	2	1/5	1	4	2	1/9	1/3	6
W-FR504	1/3	1	1/3	1/4	1/3	2	1	1/7	1/2	2
W-FR602	1/2	3	1	1/3	1/2	3	2	1/8	1/2	4
W-FR702	5	4	3	1	5	5	6	1/7	1	8
W-FR703	1	3	2	1/5	1	4	2	1/7	1/3	6
M-FR103	1/4	1/2	1/3	1/5	1/4	1	2	1/8	1/5	2
W-QR100	1/2	1	1/2	1/6	1/2	1/2	1	1/9	1/5	1
W-QR105	9	7	8	7	7	8	9	1	1/9	1/9
Learnability	3	2	2	1	3	5	5	9	1	7
M-QR101	1/6	1/2	1/4	1/8	1/6	1/2	1	9	1/7	1

Table 2.2 Cost Comparison

Value	W-FR403	W-FR504	W-FR602	W-FR702	W-FR703	M-FR103	W-QR100	W-QR105	Learnability	M-QR101
W-FR403	1	8	8	7	1	8	8	6	7	8
W-FR504	1/8	1	5	1/5	1/8	3	1	1/6	4	1/4
W-FR602	1/8	1/5	1	4	1/8	5	2	1	2	3
W-FR702	1/7	5	1/4	1	1/7	7	2	1/2	3	2
W-FR703	1	8	8	7	1	8	8	6	7	8
M-FR103	1/8	1/3	1/5	1/7	1/8	1	1/4	1/6	1	1/2
W-QR100	1/8	1	1/2	1/2	1/8	4	1	1	2	3
W-QR105	1/6	6	1	2	1/6	6	1	1	5	2
Learnability	1/7	1/4	1/2	1/3	1/7	1	1/2	1/5	1	3
M-QR101	1/8	4	1/3	1/2	1/8	2	1/3	1/2	1/3	1

Table 2.3 Value Comparison

ID	W-FR403	W-FR504	W-FR602	W-FR702	W-FR703	M-FR103	W-QR100	W-QR001	Learnability	M-QR101
Cost	7.82%	3.86%	6.44%	17.30%	7.00%	2.84%	2.61%	28.14%	17.77%	6.22%
Val	28.67%	5.72%	7.18%	7.22%	28.68%	1.95%	5.03%	8.70%	3.19%	3.66%

Table 2.4 Value and Cost Distribution

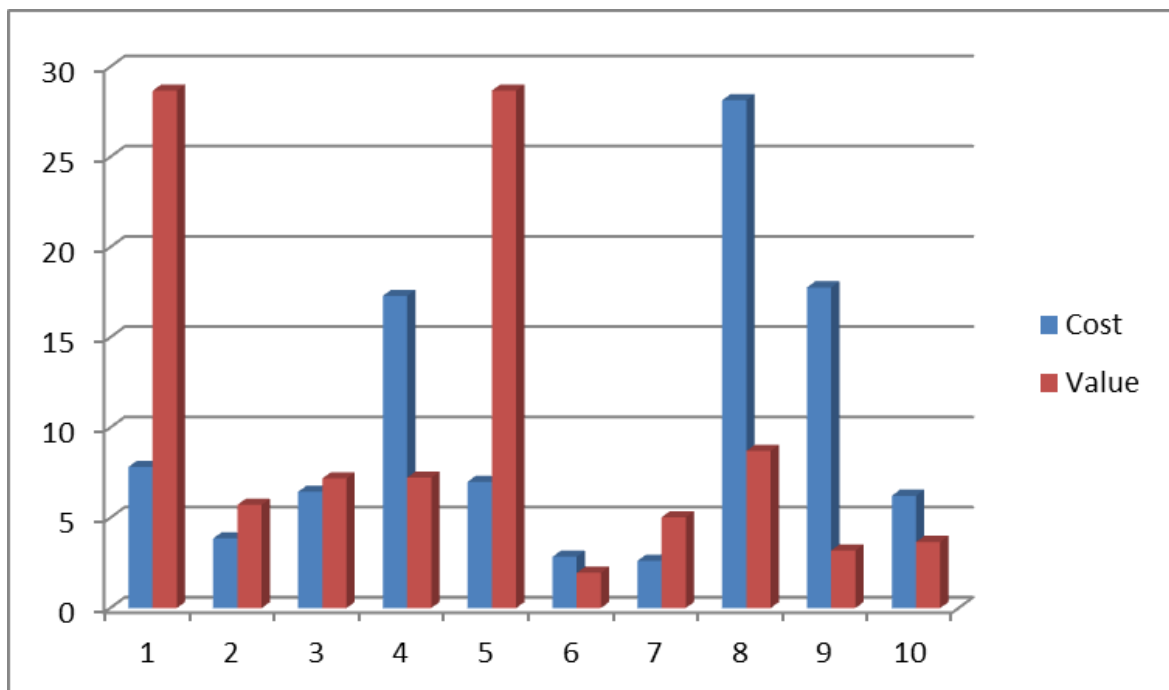


Fig 2.1 Bar Diagram of Value and Cost Distribution

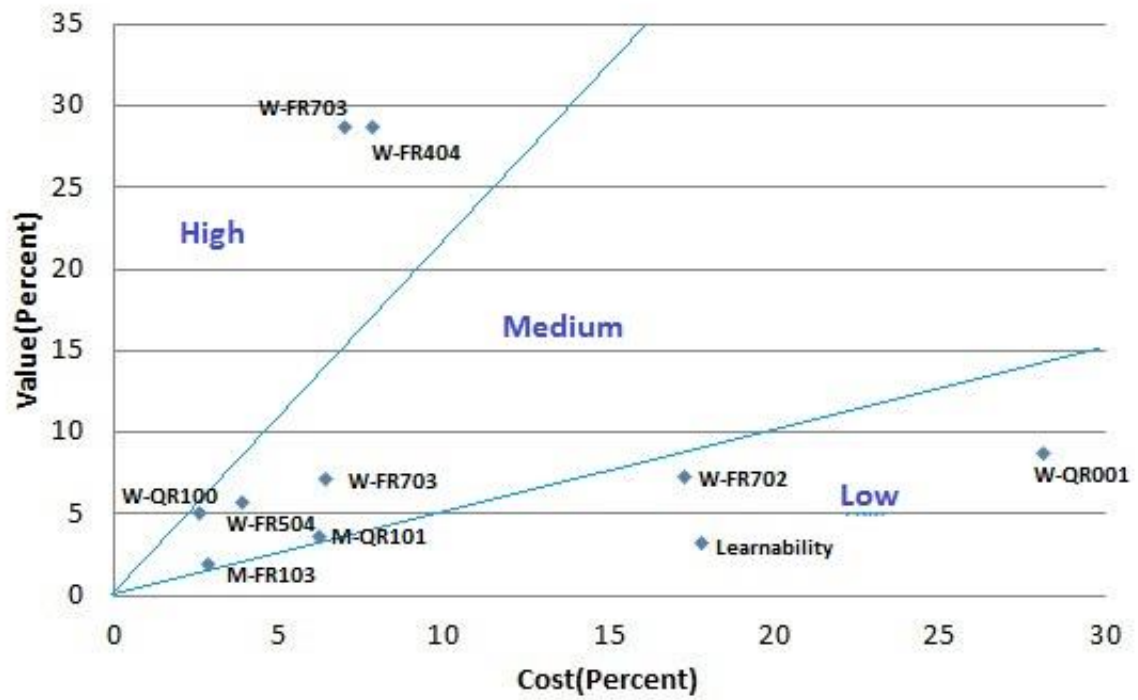


Fig 2.2 Scatter Diagram of Value and Cost Distribution