



Let's Help Bo Requirements Specification

Version 1.6

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Requirements Definition	Date: 2013-01-18

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1. Introduction

1.1 Purpose of this document

This document describes in detail all the requirements for the project "Let's Help Bo". In addition this document gives also an overview on all the functionalities that are implemented.

1.2 Intended Audience

This document is addressed to all the project team members, the supervisor, the DSD teachers and the customers.

1.3 Scope

In this document the requirements, use cases and future developments for the product will be described.

1.4 Acronyms and abbreviations

Acronym or abbreviation	Definitions
LHB	Let's Help Bo
DSD	Distributed Software development
UM	User management component
WO	Work order component
SC	Schedule component
IC	Inventory component
MC	Map component
NFR	Non-functional Requirements
CRUD	Create, read, update and delete

1.5 References

- Project DSD home page
http://www.fer.unizg.hr/rasip/dsd/projects/lets_help_bo
- Project solution desktop web page
<http://161.53.67.226:8080/Desktop>
- Project solution mobile web page
<http://161.53.67.226:8080/Mobile>

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2. Requirements Description

2.1 Introduction

Let's Help Bo is an inventory support system for future mines. The main purpose of the LHB system is to support the machine operators in their working activities. In addition, it provides other functionalities that aim to help in the daily activities of other people that work in the mine during their daily activities. The main actor of the system is the machine operator, but there are also other actors that will have a part in the system. They will be presented in details in the next chapters.

2.2 General requirements

The system provides the functions to manage an inventory system in a mine. The inventory system will be used by different kind of personas. From one side we have the machine operator that needs to use the spare parts, and on the other side the person that manages the inventory for the mine (e.g. taking care that the essential spare parts are always available). Also the functionalities to manage the work orders for the machine operators are included in the system. In addition, it is also possible to view the map of the mine, and get the shortest path to a destination (e.g. warehouse).

One of the main requirements is to develop easy to use software considering the environment in which it will be used.

2.3 Functional requirements

- All the users shall have access to the system with username and password
- The system shall provide the functionality to manage users (CRUD)
- The machine operator shall be able to see the list of his work orders
- The machine operator shall be able to update the status of his work orders (e.g. finished)
- The machine operator shall be able to view which work orders have been updated
- The machine operator shall be advised when there is a change in his work orders
- The system shall provide a work order pool where the machine operators can select a work order to complete.
- The system shall provide the functionality to manage work orders (CRUD)
- The system shall provide templates for the creation of work orders
- The system shall provide the possibility to book a spare part from a warehouse
- The machine operator shall be able to view the list of his bookings
- The system shall provide the searching functionality for spare parts
- The system shall provide the functionality to manage spare parts (CRUD)
- The system shall provide the functionality to manage the tunnels in the mine (CRUD)
- The system shall provide the functionality to manage the hotspots (e.g. warehouse, vehicle, user) in the mine (CRUD)
- The system shall provide the functionality to view the map of the mine
- The system shall provide the functionality to view the hotspots on one floor of the mine
- The system shall calculate and show the shortest path from the user current position to the selected destination (e.g. warehouse).

2.4 Non-functional requirements

2.4.1 Usability

- The software will be developed taking into account the environment in which it will be used (a mine).
- The application will be easy to use, and its use will not be frustrating for the users that will use it.
- The navigation of the user interface shall be simple minimizing the number of steps needed to achieve a goal.

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2.4.2 Security

- The system will identify all of its human users before allowing them to use its functionality
- The system will ensure that users can only access data and services for which they have been properly authorized

2.4.3 Portability and compatibility

It will be possible to use the system all the platforms that support a web browser.

3. Use Cases

3.1 Actors of the system

We identified 6 different actors that will interact with our system:

- User
- Machine operator
- Production supervisor
- Maintenance supervisor
- Mine control room operator
- System administrator

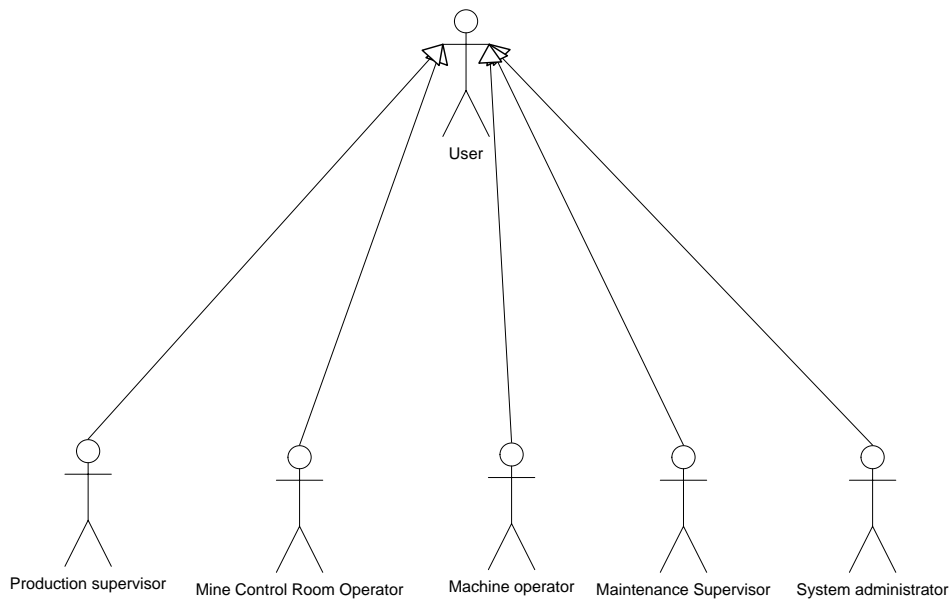


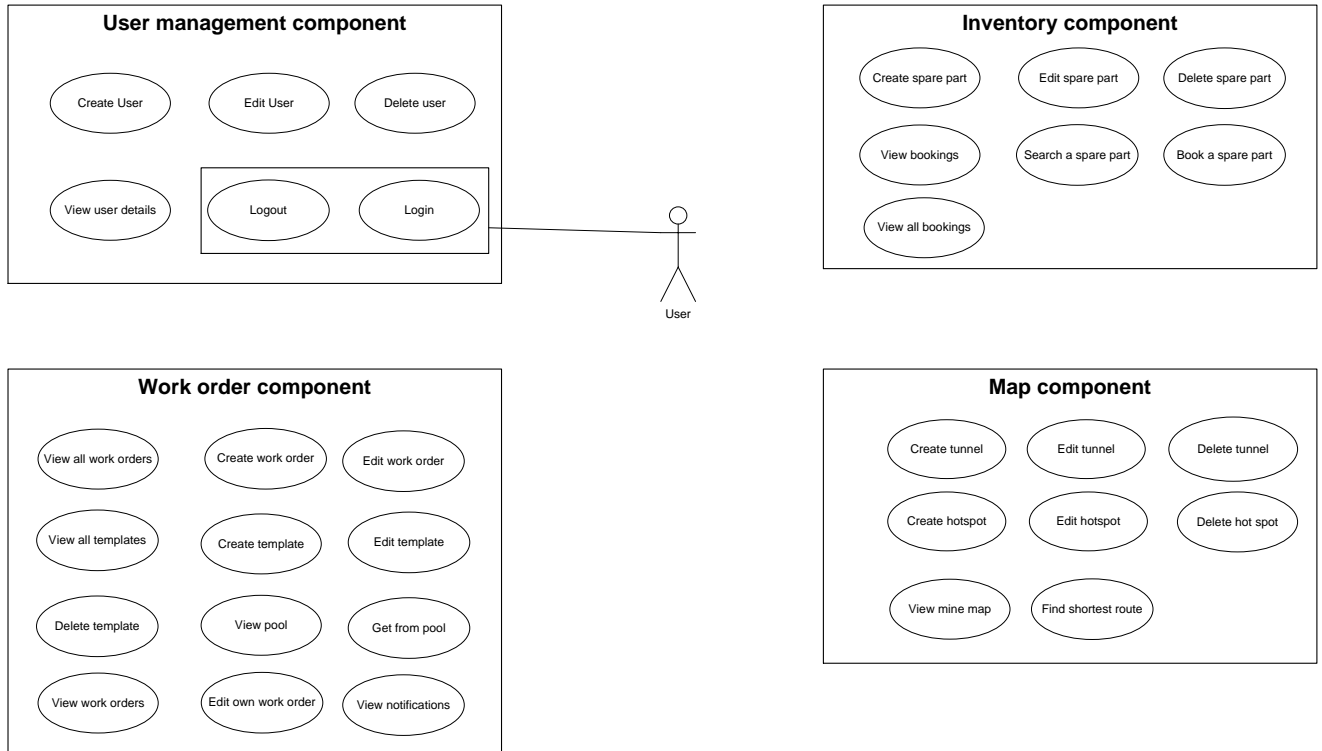
Figure 1: User hierarchy

In the next paragraphs the relation of the actors with the system will be presented.

For each of them is presented the relative use case diagram. In each use case diagram are shown the different use cases for each component of the system and with which use cases the actor is related. After each use case diagram, the relative use cases descriptions are presented. If a use case is related to more than one user, only once it will be described.

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3.2 User use case diagram



The actor "User" is related with the basic operations that interest all the actors of the system. Below will be presented in detail use cases considering user: Login, Logout, View user details and Recover password use case.

3.2.1 Use case "Login"

Use case ID	UM1
Name	Login
Goal	Successful login into system
Participating actors	User
Precondition	User has device with internet connection
Main scenario	<ol style="list-style-type: none"> 1. User access to the login page <ol style="list-style-type: none"> 1.1. User type his username and password 1.2. User picks a role from the dropdown list which automatically fills the user credentials (method used to speed up the login during software demonstrations) 2. The system checks if username and password are correct 3. User is logged in
Exceptions	
Extensions	<ol style="list-style-type: none"> 2.a User forgot his password <ol style="list-style-type: none"> 2.a.i User calls System administrator to generate new password 2.a.ii User gets password from System administrator in person
Dependent UC	All use cases

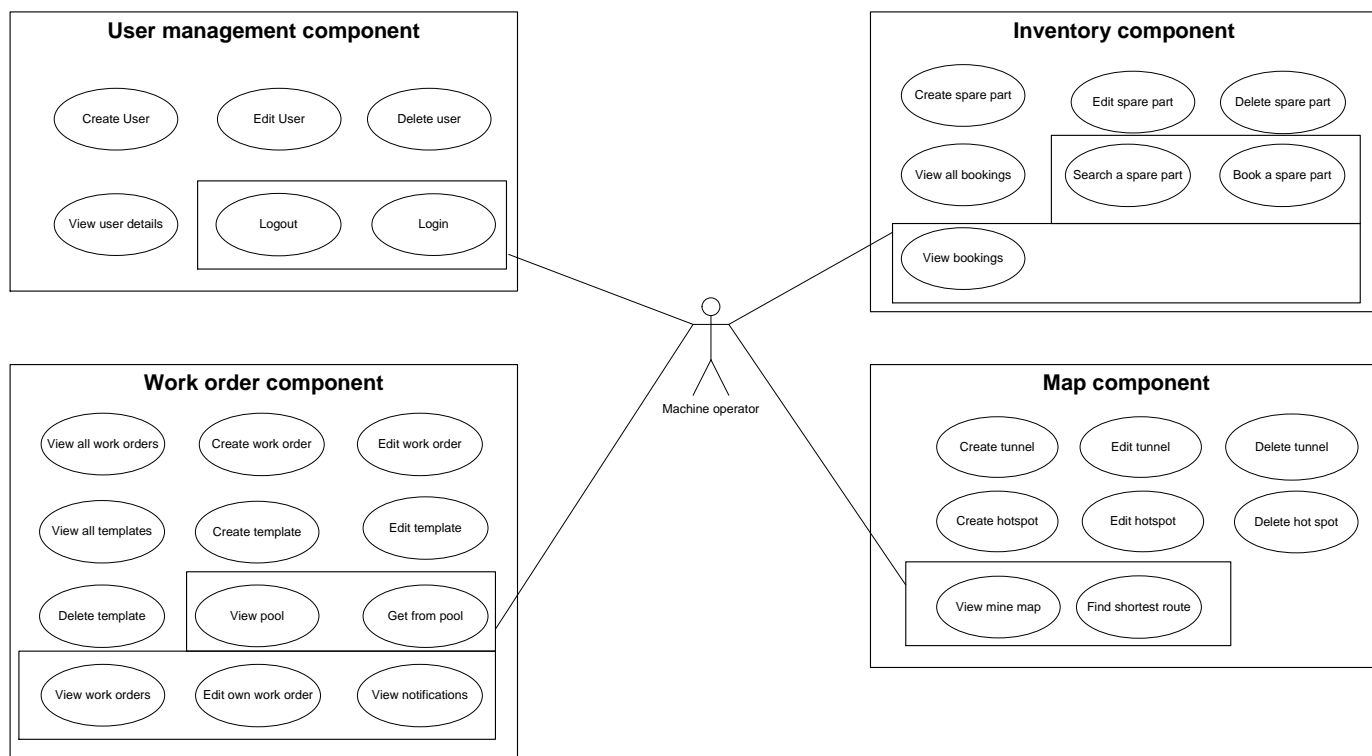
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3.2.2 Use case "Logout"

Use case ID	UM2
Name	Logout
Goal	Successful logout from the system
Participating actors	User
Precondition	User is logged in
Main scenario	<ol style="list-style-type: none"> 1. User selects logout option 2. User is logged out
Exceptions	
Extensions	
Dependent UC	

3.3 Machine operator use case diagram

In this diagram all the use cases related to the machine operator are presented.



3.3.1 Use case "View work orders"

Use case ID	WO1
Name	View work orders
Goal	View the list of work orders
Participating actors	Machine Operator
Precondition	

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Main scenario	<ol style="list-style-type: none"> 1 The user access to the work order management page 2 The system shows the list with all work orders for user
Exceptions	
Extensions	
Dependent UC	

3.3.2 Use case “View notifications”

Use case ID	WO2
Name	View notifications
Goal	View updated work orders
Participating actors	Machine operator
Precondition	Production supervisor updated user's work order
Main scenario	<ol style="list-style-type: none"> 1 The user selects the notification icon 2 The system shows the list with all updated work orders 3 User selects updated work order 4 System shows updated work order details and removes notification
Exceptions	
Extensions	
Dependent UC	

3.3.3 Use case “Edit own work order”

Use case ID	WO3
Name	Edit own work order
Goal	Update own work order in the list of his work orders
Participating actors	Machine Operator
Precondition	The user is on the screen that shows list of work orders he needs to do
Main scenario	<ol style="list-style-type: none"> 1 The user selects the work order that he wants to update 2 The system shows all the information about the work order. 3 The user updates status of the work order 4 The user saves the changes.
Exceptions	
Extensions	3.i User looks work order on map and updates status of the work
Dependent UC	

3.3.4 Use case “Book a spare part”

Use case ID	IC1
Name	Book a spare part
Goal	Book a spare part from the inventory
Participating actors	Machine Operator
Precondition	The user is on the screen that show the list of spare parts
Main scenario	<ol style="list-style-type: none"> 1 The user chooses to make a booking of a spare part from the list 2 The system shows a booking window 3 The user specifies the amount and checks the warehouse(s) which he wants the parts from

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	4 The user submits the booking 5 The system informs the user on the success of the booking
Exceptions	
Extensions	3.i User checks warehouse(s) on the map and specifies amount
Dependent UC	

3.3.5 Use case “View bookings”

Use case ID	IC2
Name	View bookings
Goal	View all spare parts bookings in the system made by user
Participating actors	Machine operator
Precondition	
Main scenario	1 The user access to the bookings page 2 The system shows the list with all active and completed bookings made by user 3 User selects to show on map certain active booking 4 System shows booking on the map
Exceptions	
Extensions	
Dependent UC	

3.3.6 Use case “Search a spare part”

Use case ID	IC3
Name	Search a spare part
Goal	Search a spare part in the inventory
Participating actors	Machine Operator or Maintenance Operator
Precondition	
Main scenario	1 The user access to the screen where to search the spare parts 2 The system show a form where to insert the information of the spare parts 3 The user chooses a criteria to search by 4 The user enters the search term 5 The system shows the list of the spare parts that match the search criteria.
Exceptions	
Extensions	4.i There are not spare part matching the search criteria and the list presented is empty
Dependent UC	

3.3.7 Use case “View pool”

Use case ID	WO7
Name	View pool
Goal	View the list of all work orders in pool
Participating actors	Machine Operator
Precondition	
Main scenario	1 The user access to the work order pool page 2 The system shows the list with all unassigned work orders
Exceptions	
Extensions	

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Dependent UC	
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3.3.8 Use case “Get from pool”

Use case ID	WO8
Name	Get from pool
Goal	Add work order from pool to the list of own work orders
Participating actors	Machine Operator
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user access to the work order pool page 2 The system shows the list with all work orders that are not yet assigned and are available to machine operators 3 User choose work order and selects to add it to his list 4 The system informs the user if adding was successful
Exceptions	
Extensions	
Dependent UC	

3.3.9 Use case “View mine map”

Use case ID	MC7
Name	View mine map
Goal	View the map of the mine
Participating actors	Machine operator, Mine control room operator, Maintenance supervisor, Production supervisor, System administrator
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user accesses to the map management page and chooses the view map option The system shows the form where to select the floor and the type of hotspots to view (e.g. warehouse, production front, vehicle etc.) 2 The user select the floor and the type of hotspots to view 3 The system shows the map for the selected floor with the hotspots type selected
Exceptions	
Extensions	
Dependent UC	

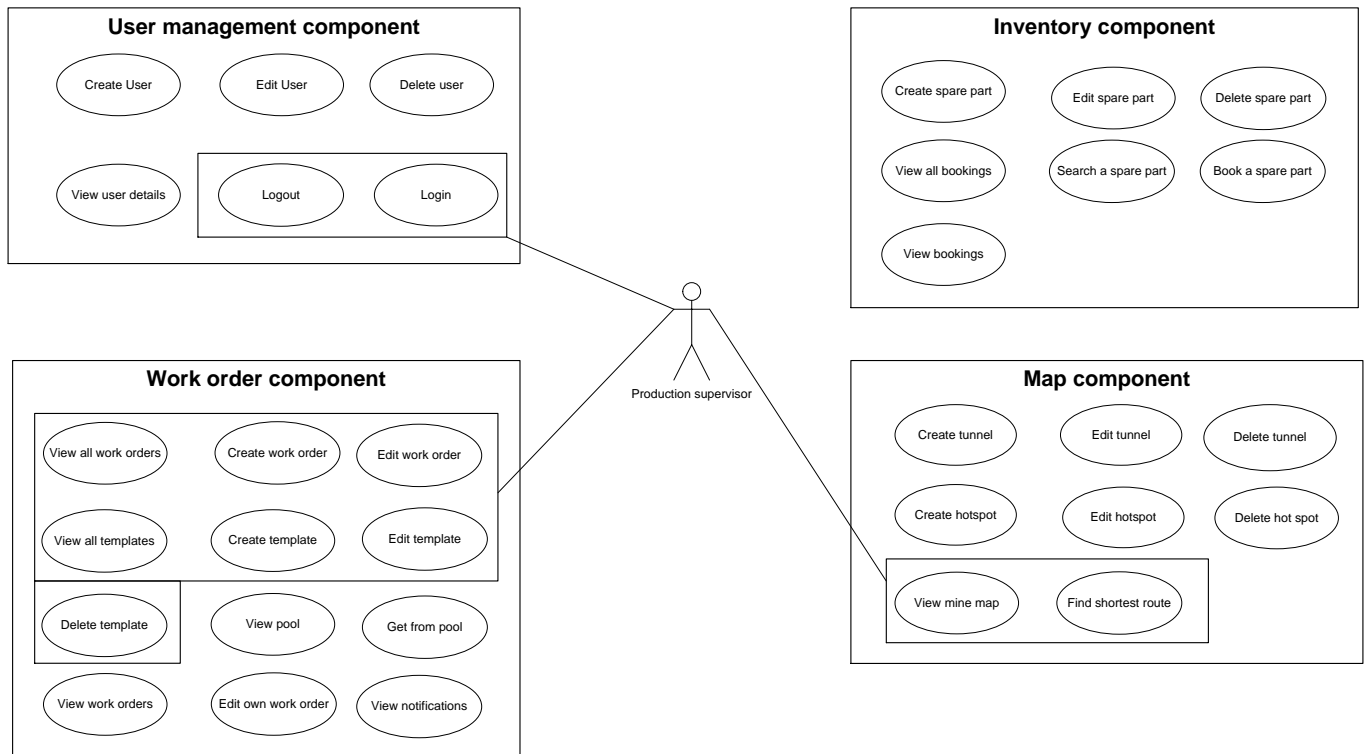
3.3.10 Use case “Find shortest route”

Use case ID	MC8
Name	Find shortest route
Goal	Find the shortest path from the current position to a place (warehouse, work order place)
Participating actors	Machine operator
Precondition	User is on the work order page or booking page
Main scenario	<ol style="list-style-type: none"> 1 User choose option to show on map the destination (e.g. work order place)

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	2 System calculates and shows shortest path to the place selected
	3 User views the shortest path
Exceptions	
Extensions	
Dependent UC	

3.4 Production supervisor use case diagram



3.4.1 Use case "Create work order"

Use case ID	WO4
Name	Create work order
Goal	Create new work order in system
Participating actors	Production supervisor
Precondition	The user is on the main screen of the application
Main scenario	<ol style="list-style-type: none"> 1 The user access to the work order management page 2 The system shows the screen with all work orders and options 3 The user choose to add a new work order 4 The system shows the screen with a form to fill in with the information of the work order. 5 The user inserts all the necessary information (description, time, details etc.), selects hotspot of work order and assigns this work order to certain machine operator or selects work order from list of templates. 6 The user saves the work order.
Exceptions	
Extensions	

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Dependent UC	Edit work order
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3.4.2 Use case “Edit work order”

Use case ID	WO5
Name	Edit work order
Goal	Updated work order
Participating actors	Production supervisor
Precondition	The user is on the screen that shows all work orders
Main scenario	<ol style="list-style-type: none"> 1 The user choose to modify the certain active work order 2 The user updates the information of the work order and save the changes. 3 The system sends a notification message about update to machine operator.
Exceptions	
Extensions	
Dependent UC	View notifications

3.4.3 Use case “View all work orders”

Use case ID	WO6
Name	View all work orders
Goal	View all the work orders in the system
Participating actors	Production supervisor
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user access to the work order management page 2 The system shows the list with all work orders
Exceptions	
Extensions	
Dependent UC	

3.4.4 Use case “View all templates”

Use case ID	WO9
Name	View all templates
Goal	View all templates for work orders in the system
Participating actors	Production supervisor
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user access to the templates page 2 The system shows the list with all templates for work orders
Exceptions	
Extensions	

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Dependent UC	
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3.4.5 Use case “Create template”

Use case ID	WO10
Name	Create template
Goal	Create new work order template in system
Participating actors	Production supervisor
Precondition	The user is on the main screen of the application
Main scenario	<ol style="list-style-type: none"> 1 The user access to the templates page 2 The system shows list of all work order templates 3 The user choose to add a new work order template 4 The system shows the screen with a form to fill in with the information of the work order template 5 The user inserts all the necessary information (description, time, details etc.) 6 The user saves the work order template 7 The system informs the user if saving was successful
Exceptions	<ol style="list-style-type: none"> 1.i The user is on create work order page or edit work order page 1.ii The user selects to save current work order as template 1.iii Go to step 6
Extensions	
Dependent UC	Edit work order template, Delete work order template

3.4.6 Use case “Edit template”

Use case ID	WO11
Name	Edit template
Goal	Updated work order template
Participating actors	Production supervisor
Precondition	The user is on the screen that shows all work order templates
Main scenario	<ol style="list-style-type: none"> 1 The user choose to modify the certain work order template 2 The user updates the information of the template and save the changes.
Exceptions	
Extensions	
Dependent UC	

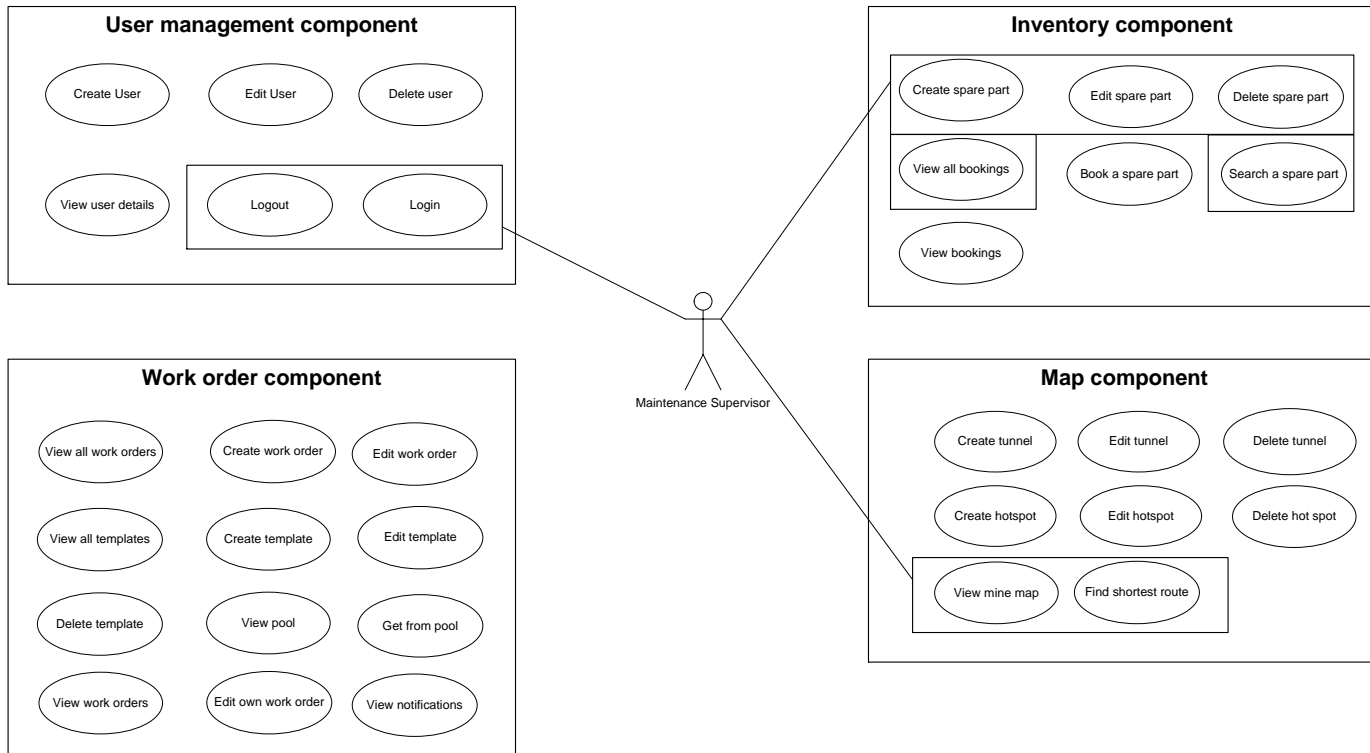
3.4.7 Use case “Delete template”

Use case ID	WO12
Name	Delete template
Goal	Deleted work order template
Participating actors	Production supervisor
Precondition	The user is on the screen that shows all work order templates

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Main scenario	1 The user choose to delete the certain work order template 2 System notifies user if action was successful
Exceptions	
Extensions	
Dependent UC	

3.5 Maintenance supervisor use case diagram



3.5.1 Use case "Create spare part"

Use case ID	IC4
Name	Create spare part
Goal	Create a new spare part in the inventory system
Participating actors	Maintenance supervisor
Precondition	
Main scenario	1 The user accesses to the inventory management page and chooses to add a new product or product item. 2 The system shows the fields to fill in with the information of the spare part. 3 The user fills the needed information for the spare part. 4 The user saves his work.
Exceptions	4.i The user inserted wrong information 4.ii The system show a notification stating that the information are wrong and need to be corrected. 4.iii Go to step 3
Extensions	
Dependent UC	Edit spare part, Delete spare part

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3.5.2 Use case “Edit spare part”

Use case ID	IC5
Name	Edit spare part
Goal	Edit the information of a spare part in the inventory system
Participating actors	Maintenance supervisor
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user accesses to the inventory management page and chooses the spare part product to update. 2 The system shows all the information of the spare part product 3 The user update the information 4 The user saves the changes
Exceptions	<ol style="list-style-type: none"> 4.i The user inserted wrong information 4.ii The system show a notification stating that the information are wrong and need to be corrected. 4.iii Go to step 3
Extensions	
Dependent UC	

3.5.3 Use case “Delete spare part”

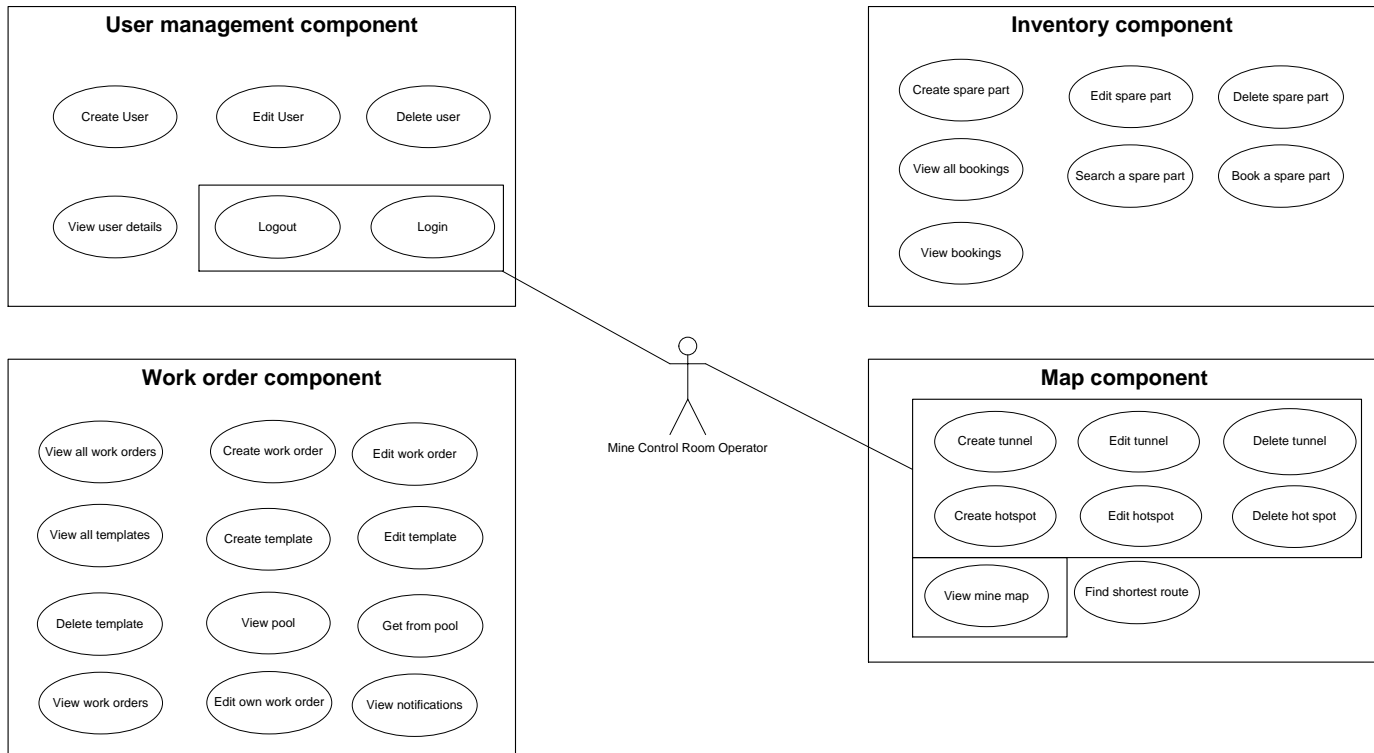
Use case ID	IC6
Name	Delete spare part
Goal	Delete spare part from the inventory system
Participating actors	Maintenance supervisor
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user accesses to the inventory management page. 2 The system shows all the information of the spare part 3 The user choose to delete the spare part product from the inventory
Exceptions	
Extensions	
Dependent UC	

3.5.4 Use case “View all bookings”

Use case ID	IC7
Name	View all bookings
Goal	View all spare parts bookings in the system
Participating actors	Maintenance supervisor
Precondition	
Main scenario	<ol style="list-style-type: none"> 5 The user access to the bookings page 6 The system shows the list with all active and completed bookings
Exceptions	
Extensions	
Dependent UC	

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3.6 Mine control room operator use case diagram



3.6.1 Use case "Create tunnel"

Use case ID	MC1
Name	Create tunnel
Goal	Create a new tunnel in the map of the mine
Participating actors	Mine control room operator
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user accesses to the map management page and chooses the create tunnel option. 2 The system shows the form to fill in with the information of the tunnel. 3 The user fills the needed information for the tunnel 4 The user saves his work. 5 The system notifies that the operation succeed
Exceptions	<ol style="list-style-type: none"> 4.i The user inserted wrong information 4.ii The system show a notification stating that the information are wrong and need to be corrected. 4.iii Go to step 3
Extensions	
Dependent UC	Edit tunnel, Delete tunnel

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3.6.2 Use case “Edit tunnel”

Use case ID	MC2
Name	Edit tunnel
Goal	Edit the information of a tunnel in the map of the mine
Participating actors	Mine control room operator
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user accesses to the map management page and chooses the select tunnel option. 2 The system shows all the information of the tunnels on the map 3 The user select the tunnel to update 4 The system show the form with the information of the tunnel 5 The user update the information 6 The user saves the changes 7 The system notifies that the operation succeed
Exceptions	<ol style="list-style-type: none"> 6.i The user inserted wrong information 6.ii The system show a notification stating that the information are wrong and need to be corrected. 6.iii Go to step 5
Extensions	
Dependent UC	

3.6.3 Use case “Delete tunnel”

Use case ID	MC3
Name	Delete tunnel
Goal	Delete a tunnel in the map of the mine
Participating actors	Mine control room operator
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user accesses to the map management page and chooses the select tunnel option. 2 The system shows all the information of the tunnels on the map 3 The user select the tunnel to delete 4 The system show the form with the information of the tunnel 5 The user choose to delete the tunnel 6 The system show a confirmation window 7 The user confirm the operation 8 The system notifies that the operation succeed
Exceptions	6.i The user does not confirm the operation
Extensions	
Dependent UC	

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3.6.4 Use case "Create hotspot"

Use case ID	MC4
Name	Create hotspot
Goal	Create a new hotspot in the map of the mine
Participating actors	Mine control room operator
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user accesses to the map management page and chooses the create hotspot option. 2 The system shows the form to fill in with the information of the hotspot. 3 The user fills the needed information for the hotspot 4 The user saves his work. 5 The system notifies that the operation succeed
Exceptions	<ol style="list-style-type: none"> 4.i The user inserted wrong information 4.ii The system show a notification stating that the information are wrong and need to be corrected. 4.iii Go to step 3
Extensions	
Dependent UC	Edit hotspot, Delete hotspot

3.6.5 Use case "Edit hotspot"

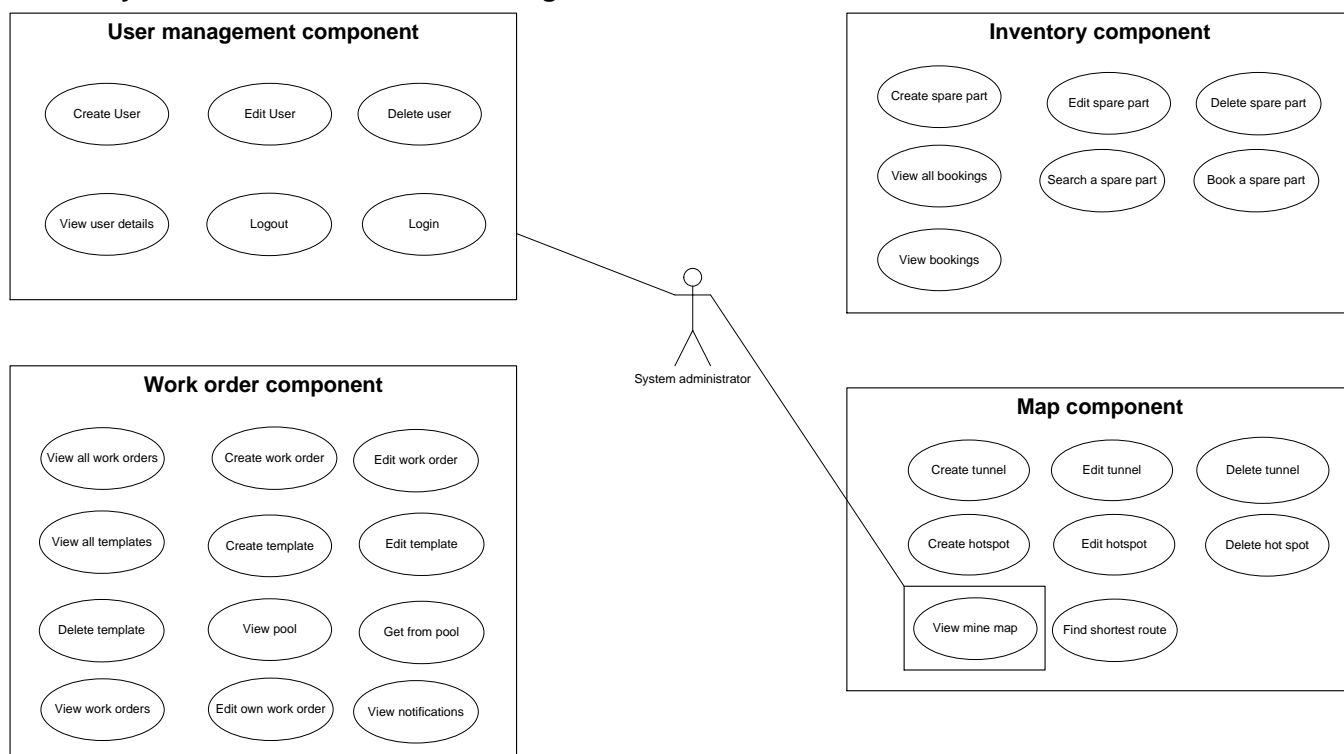
Use case ID	MC5
Name	Edit hotspot
Goal	Edit the information of a hotspot in the map of the mine
Participating actors	Mine control room operator
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user accesses to the map management page and chooses the select hotspot option. 2 The system shows all the information of the hotspots 3 The user select the hotspot to update 4 The system show the form with the information of the hotspot 5 The user update the information 6 The user saves the changes 7 The system notifies that the operation succeed
Exceptions	<ol style="list-style-type: none"> 6.i The user inserted wrong information 6.ii The system show a notification stating that the information are wrong and need to be corrected. 6.iii Go to step 5
Extensions	
Dependent UC	

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3.6.6 Use case "Delete hotspot"

Use case ID	MC6
Name	Delete hotspot
Goal	Delete a hotspot in the map of the mine
Participating actors	Mine control room operator
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user accesses to the map management page and chooses the select hotspot option. 2 The system shows all the information of the hotspots on the map 3 The user select the hotspot to delete 4 The system show the form with the information of the hotspot 5 The user choose to delete the hotspot 6 The system show a confirmation window 7 The user confirm the operation 8 The system notifies that the operation succeed
Exceptions	6.i The user does not confirm the operation
Extensions	
Dependent UC	

3.7 System administrator use case diagram



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3.7.1 Use case “Create user”

Use case ID	UM3
Name	Create user
Goal	Add new user to system
Participating actors	System administrator
Precondition	The user received a request to create a new user
Main scenario	<ol style="list-style-type: none"> 1 The user opens user management panel 2 Selects option to add new user 3 User enters all the information regarding the new user 4 The user save the new user in the system
Exceptions	
Extensions	4.i The user can select cancel button which will redirect him to the homepage
Dependent UC	Edit user, Delete user

3.7.2 Use case “View user details”

Use case ID	UM4
Name	View user details
Goal	View details of user
Participating actors	System administrator
Precondition	User is logged in
Main scenario	<ol style="list-style-type: none"> 1. The user opens user management panel 2. User enters search parameters 3. The system shows the information relative to search results 4. User selects certain user whose details he wants to see 5. System shows selected user details
Exceptions	4.i If user is on desktop version user details are shown inside search results
Extensions	
Dependent UC	

3.7.3 Use case “Edit user”

Use case ID	UM5
Name	Edit user
Goal	Updates user account info in system
Participating actors	System administrator
Precondition	<ul style="list-style-type: none"> • The user receives new message from headquarters with the list of names and IDs, which information have to be updated or he gets request from user to change his password.
Main scenario	<ol style="list-style-type: none"> 1 The user goes to user management panel 2 The system list all the users in the system 3 The user select the relative user 4 The system shows the information regarding the user 5 The user updates user information 6 The user saves changes

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Exceptions	7.i The user inserted wrong information 7.ii The system show a notification stating that the information are wrong and need to be corrected. 7.iii Go to step 5
Extensions	
Dependent UC	

3.7.4 Use case “Delete user”

Use case ID	UM6
Name	Delete user
Goal	Delete user from system
Participating actors	System administrator
Precondition	
Main scenario	<ol style="list-style-type: none"> 1 The user goes to user management panel 2 The system list all the users in the system 3 The user select the relative user 4 The system shows the information regarding the user 5 The user choose to delete the selected user 6 The system shows a confirmation window 7 User confirms operation
Exceptions	
Extensions	
Dependent UC	

4. Requirements Definition

4.1 Requirement Group Definitions

Identification	Requirement Group	Rem.
UM	User management component	
IC	Inventory component	
MC	Map component	
WO	Work order component	
NR	Nonfunctional requirements	

4.2 Requirement Sources

Source	Description	Rem.
Ctm	Customer (ABB) defined requirement	
Sys	Required as a consequence of system design	
Dev	Developers	

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4.3 Requirement definitions

Identity	Status	Priority	Reference	Description	Source
				User management component	
UM-1	I	1		Logging	Sys
UM-1.1	I	1	3.2.1, UM1	Logging in	Sys
UM-1.2	I	1	3.2.2, UM2	Logging out	Sys
UM-2	I	2		Managing users	Sys
UM-2.1	I	2	3.7.1, UM3	Creating user	Sys
UM-2.2	I	2	3.7.2, UM4	Viewing user details	Sys
UM-2.3	I	2	3.7.3, UM5	Editing user	Sys
UM-2.3.1	D	3	3.2.4, UM3	Recovering password	Sys
UM-2.4	I	2	3.7.4, UM6	Deleting user	Sys
				Work order component	
WO-1	I	1		Viewing work orders	Ctm
WO-1.1	I	1	3.3.1, WO1	Viewing assigned work orders	Dev
WO-1.1.1	A	2	3.3.2, WO2	Viewing updated work orders	Dev
WO-1.2	I	1	3.4.3, WO6	Viewing all work orders	Dev
WO-2	I	1		Managing work orders	Ctm
WO-2.1	I	1	3.4.1, WO4	Creating work order	Ctm
WO-2.2	I	1		Editing work orders	Ctm
WO-2.2.1	I	1	3.3.3, WO3	Machine operator editing	Dev
WO-2.2.2	I	1	3.4.2, WO5	Production supervisor editing	Dev
WO-3	A	2	3.3.7, WO7	Viewing work order pool	Ctm
WO-4	A	2	3.3.8, WO8	Getting work order from pool	Ctm
WO-5	A	3	3.4.4, WO9	Viewing work order templates	Dev
WO-6	A	3		Managing work order templates	Dev
WO-6.1	A	3	3.4.5,WO10	Creating work order template	Dev
WO-6.2	A	3	3.4.6,WO11	Editing work order template	Dev
WO-6.3	A	3	3.4.7,WO12	Deleting work order template	Dev
	D			Schedule component	
SC-1	D	3		Viewing schedules	Ctm
SC-1.1	D	3		Viewing own schedule	Dev
SC-1.2	D	3		Viewing all schedules	Dev
SC-2	D	3		Managing schedules	Ctm
SC-2.1	D	3		Creating schedule	Ctm
SC-2.2	D	3		Editing schedule	Ctm
				Inventory component	
IC-1	I	1	3.3.4, IC1	Booking spare part	Ctm
IC-2	A	1		Viewing bookings	Dev
IC-2.1	A	1	3.3.5, IC2	Viewing own bookings	Dev
IC-2.2	A	1	3.5.4, IC7	Viewing all bookings	Dev
IC-3	I	1	3.3.6, IC3	Searching spare part	Ctm
IC-3.1	D	1	3.3.3, IC1	Viewing spare part details	Ctm
IC-4	I	1		Managing spare parts	Ctm
IC-4.1	I	1	3.5.1, IC4	Creating spare parts	Ctm
IC-4.2	I	1	3.5.2, IC5	Editing spare parts	Ctm
IC-4.3	I	1	3.5.3, IC6	Deleting spare parts	Ctm
				Map component	
MC-1	I	2		Managing map	Ctm
MC-1.1	I	2		Managing tunnels	Dev
MC-1.1.1	I	2	3.6.1, MC1	Creating tunnel	Dev
MC-1.1.2	I	2	3.6.2, MC2	Editing tunnel	Dev

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MC-1.1.3	I	2	3.6.3, MC3	Deleting tunnel	Dev
MC-1.2	I	2		Managing hotspots	Dev
MC-1.2.1	I	2	3.6.4, MC4	Creating hotspot	Dev
MC-1.2.2	I	2	3.6.5, MC5	Editing hotspot	Dev
MC-1.2.3	I	2	3.6.6, MC6	Deleting hotspot	Dev
MC-2	I	1	3.6.7, MC7	Viewing map	Ctm
MC-2.1	I	1	3.6.8, MC8	Finding shortest route	Ctm
				Nonfunctional requirements	
NR-1	I	1	2.4.1	Usability	Ctm
NR-2	I	2	2.4.2	Security	Sys
NR-5	I	1	2.4.3	Portability and compatibility	Sys

Requirement status:

- I* = *initial* (this requirement has been identified at the beginning of the project),
- D* = *dropped* (this requirement has been deleted from the requirement definitions),
- H* = *on hold* (decision to be implemented or dropped will be made later),
- A* = *additional* (this requirement was introduced during the project course).

4.3.1 Change Log

Identity	Action	Date	Comments
SC1, SC2	D	8.11.2012.	The team agreed to simplify the database by dropping schedule component.
UM-2.3.1	D	20.11.2012.	Users will be able only to get new password direct from system administrator
IC-2	A	25.11.2012.	Added view bookings functionality
IC-3.1	D	30.11.2012.	Viewing spare part details included in search spare parts
WO-1.1.1	A	14.12.2012.	Added notification for updated work orders

Requirement status:

- D* = *dropped* (this requirement has been deleted from the requirement definitions),
- H* = *on hold* (decision to be implemented or dropped will be made later),
- A* = *added* (this requirement was introduced during the project course).
- R* = *resurrected* (dropped or on hold requirement was reactivated)

5. Future Development

Since the time is limited we decided to focus on the functionalities described above, but we also identified additional functionalities to add to the system:

- Layout optimization
- Hazards reporting(e.g. crack in a tunnel)
- Include other actors in the system
- Spare part cart
- Integrate spare part cart with multiple routes planning
- Usability increasing
- Native application for iPhone and Windows phone