

QR Marks the Spot@MDH	Version: 2.0
Requirements Definition	Date: 2009-10-06

# **QR Marks the Spot@MDH Requirements Definition**

**Version 2.0**

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## Revision History

<b>Date</b>	<b>Version</b>	<b>Description</b>	<b>Author</b>
2009-10-01	1.0	Initial Draft	Sriram Sundar Rajan, Soumya Kanti Chakraborty
2009-10-06	2.0	Change in Use Case Diagram and in Section 4 – Added Non Functional Requirement.	Sriram Sundar Rajan, Soumya Kanti Chakraborty

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# 1. Introduction

## 1.1 Purpose of this document

The purpose of the document is to provide details of the requirements that the project 'QR Marks the Spot@MDH' addresses.

## 1.2 Intended Audience

The document is intended for -

- (a) Customer and project supervisor to verify if the requirements have been captured correctly.
- (b) Project team members to get an overview of the system to be built.

## 1.3 Scope

The document provides information about the generic and specific requirements of the project and a detailed use case model depicting the system's intended functions.

## 1.4 Definitions and acronyms

### 1.4.1 Definitions

Keyword	Definitions

### 1.4.2 Acronyms and abbreviations

Acronym or abbreviation	Definitions
MDH	Mälardalen University, Vasteras, Sweden
QR	Quick Response
Admin	Administrator

## 1.5 References

## **2. Requirements Description**

### **2.1 Introduction**

The objective of the 'QR Marks the Spot@MdH' project is to popularize the use of QR Codes. QR Codes encapsulates texts and URLs inside them that could be read with a camera mobile and a QR Reader. Widely used in the vehicle manufacturing industry to track parts, the proposed solution must increase the use of QR codes in a practical way and make them more accepted and widespread.

### **2.2 General requirements**

The basic requirement of the project is two-fold:

1. Develop a website that is user friendly
2. Make use of QR codes which can contain short messages such as URL, hint, puzzle or clues.

It is proposed to built a website that enables people to travel within a community/city using bikes at no cost. The bikes would have a QR code which will be a combination of a website address and a number that uniquely identifies it. The end user can start using the bike by reading the QR code with his/her camera mobile. The QR reader directs the user to a web page by reading the website link available in the QR code to tag the user against the bike. Once the user reaches the destinations, he can again read the QR code to connect to the website to update the location of the place where the bike is left.

The proposed website can also be accessed from a personal computer or laptop where the end users can search the system to find bikes nearest to their location.

### **2.3 Real and Virtual World**

The system must be designed in such a way that certain activities need to carried out in the real world. The use of bikes with QR codes in the proposed solution represents the real world aspect of the requirement and the website used to track bike details represents the virtual aspect of the requirement.

### **2.4 Web 2.0**

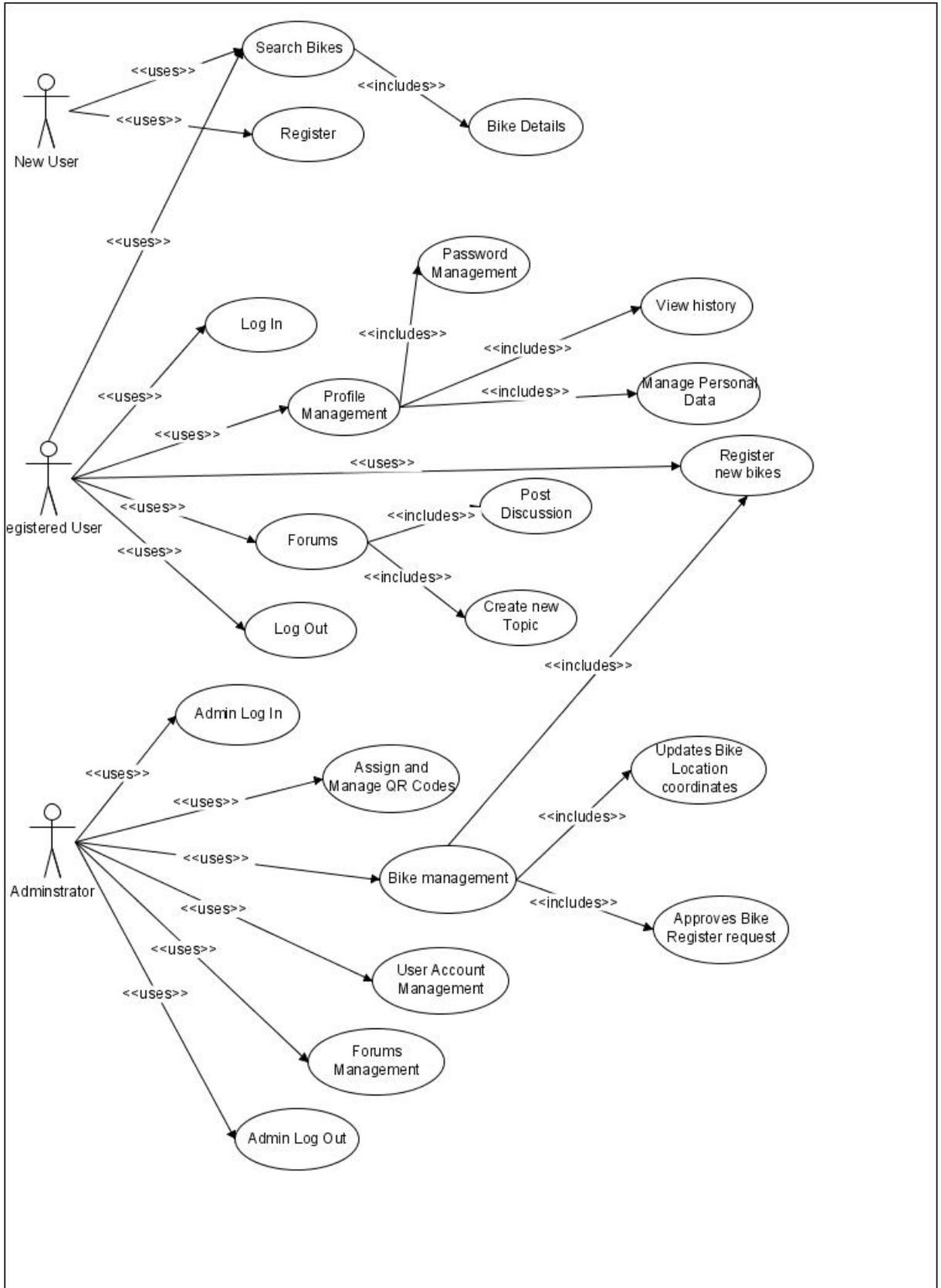
The system must be designed in such a way that it can be integrated with various existing services such as Google maps, Facebook etc. In the proposed solution, the website is integrated with Google maps which are used by the end user to update the location of the bike.

### **2.5 Communication between the end users**

The system must support exchange of information within the users. In the proposed solution, the website will host a forum where the end-users can create new posts and reply to existing ones. For instance, users can discuss about location of bikes, state of bikes , interesting routes etc.

### 3. Use Case Models

#### 3.1 Use case model 1 – Wannabike Website (PC/Laptop Access)



### 3.1.1 Use case "Search Bikes"

**Initiator:**

*New User, Registered User*

**Goal:**

*To Search bikes based on location.*

**Main Scenario:**

1. *User enters the website*
2. *User clicks on the "search bikes" button*
3. *User enters the location.*
4. *The system searches for the bikes nearest to the location entered.*
5. *User gets the nearest bikes to the location*

**Extensions:**

*If the user enters any location for which no bikes are registered in the database, the user is asked to enter any other location.*

### 3.1.2 Use case "Register"

**Initiator:**

*New User*

**Goal:**

*To get registered in the website*

**Main Scenario:**

1. *User enters the website*
2. *User clicks on the "Register" button*
3. *A Form with mandatory specific fields is displayed to the user*
4. *The User fills up the form and clicks on submit*
5. *The Data gets stored into the database and a registration successful message is displayed to the user.*

**Extensions:**

*If the user keeps some fields empty or enters any wrong data the system throws back a error message and the user has to fill up the form again.*

### 3.1.3 Use case "Login"

**Initiator:**

*Registered User*

**Goal:**

*To login into the website*

**Main Scenario:**

1. *User enters the website*
2. *User clicks on the "Login" button*
3. *User enter the user name and password and click on the submit button.*
4. *System checks the input data matches with the database and on a successful match takes the user inside the user panel.*

**Extensions:**

*If the user enters invalid username or password, then a error is thrown and the user is requested to enter valid credentials.*

**3.1.4 Use case "Profile Management"****Initiator:**

*Registered User*

**Goal:**

*To manage the profile settings of the user.*

**Main Scenario:**

- 1. User after successful login user clicks on the tab "Profile Management".*
- 2. User enters into the profile management section of the website.*
- 3. User changes and modifies specific settings base on his need.*

**3.1.5 Use case "Password Management"****Initiator:**

*Registered User*

**Goal:**

*User can change password, request for new password.*

**Main Scenario:**

- 1. User clicks on the tab "Profile Management".*
- 2. User clicks on the button "Password Management"*
- 3. User is given a option to change his password, change his security question etc.*
- 4. User does the necessary changes and save it.*

**Extensions:**

*In case the user doesn't want to modify his password he can simply go back to the Profile Management.*

**3.1.6 Use case "View History"****Initiator:**

*Registered User*

**Goal:**

*User can view the earlier data of booking bikes.*

**Main Scenario:**

- 1. User clicks on the tab "Profile Management".*
- 2. User clicks on the button "View History"*
- 3. User views all his history of booking bikes.*

**3.1.7 Use case "Manage Personal Data"****Initiator:**

*Registered User*

**Goal:**

*User changes and updates his/her personal data.*

**Main Scenario:**

1. User clicks on the tab “Profile Management”.
2. User clicks on the button “Manage Personal Data”
3. User updates his personal data like address and mobile number

3.1.8 Use case “Register New Bikes”

**Initiator:**

*Registered User, Admin*

**Goal:**

*User requests the admin to add his/her bike.*

**Main Scenario (User):**

1. User clicks on the “Register New Bikes” button
2. A Form comes up with necessary details to be filled in by the user.
3. User clicks on Submit and the request goes to Admin for approval

**Main Scenario (Admin):**

1. Admin logs in to the website using his credentials.
2. After his login gets validated he gets into the Admin login panel.
3. Admin clicks on “Register New Bikes” button and fills up the necessary form and submits the form. The form data gets submitted to the database.

**Extensions:**

*The Admin can always disapprove the user requests with valid reasons.*

3.1.9 Use case “Forums”

**Initiator:**

*Registered User*

**Goal:**

*User discusses anything about bikes, location and other things with other users.*

**Main Scenario:**

1. User clicks on the “Forum” button
2. User discusses about bikes, its location, interesting routes, missing bikes

3.1.10 Use case “Post Discussion”

**Initiator:**

*Registered User*

**Goal:**

*User posts new discussion on any existing topic in the forum*

**Main Scenario:**

1. User clicks on the “Forum” button
2. User clicks on the required topic for which he wants to discuss.
3. User writes in the text area and clicks “Post discussion” button to post the related discussion.

**Extensions:**

*After writing something in the discussion text area the user can opt not to post it by pressing the cancel button.*

3.1.11 Use case “Create New Topic”

**Initiator:**

*Registered User*

**Goal:**

*User creates new topic in the forum.*

**Main Scenario:**

- 1. User clicks on the "Forum" button*
- 2. User clicks on the "New Topic" button.*
- 3. User creates the post and clicks on Submit.*

**3.1.12 Use case "Log Out"****Initiator:**

*Registered User*

**Goal:**

*User logs out from the system*

**Main Scenario:**

- 1. User clicks on the "Logout" button*
- 2. User gets logged out of the system and gets into the main page.*

**3.1.13 Use case "Admin Log In"****Initiator:**

*Admin*

**Goal:**

*To login into the website as Admin*

**Main Scenario:**

- 1. Admin enters into the website*
- 2. Admin clicks on the "Login" button*
- 3. Admin enter the user name and password and click on the submit button.*
- 4. System checks the admin input data matches with the database and on a successful match takes the admin inside the admin panel.*

**Extensions:**

*If the admin enters invalid username or password, then a error is thrown and the admin is requested to enter valid credentials.*

**3.1.14 Use case "Assign and Manage QR Codes"****Initiator:**

*Admin*

**Goal:**

*Manages QR codes and assign new QR codes to bikes*

**Main Scenario:**

- 1. Admin enters into Admin panel after successful login.*
- 2. Admin clicks on the "Manage QR Codes" button*
- 3. Admin can assign new codes and can change existing codes in this section.*
- 4. After making changes admin clicks on submit which updates the database.*

**3.1.15 Use case "Bike Management"**

**Initiator:**

*Admin*

**Goal:**

*Manages the use of bikes, addition and deletion of bikes.*

**Main Scenario:**

- 1. Admin enters into Admin panel after successful login.*
- 2. Admin clicks on the "Bike Management" button.*
- 3. Admin manages use of bikes, addition and deletion of bikes and also accepts and denies user bike requests.*
- 4. After making changes admin clicks on submit which updates the database.*

**3.1.16 Use case "Updates Bike Location coordinates"****Initiator:**

*Admin*

**Goal:**

*Admin updates the Bike location coordinates after the user returns the bike*

**Main Scenario:**

- 1. Admin enters into Admin panel after successful login.*
- 2. After user returns the bike, he/she updates the bike location with help of Google map and admin updates the coordinates in the system.*
- 3. After making changes admin clicks on submit which updates the bike coordinates.*

**3.1.17 Use case "Approves User Bike Request"****Initiator:**

*Admin*

**Goal:**

*Admin approves user requests for registering there bikes.*

**Main Scenario:**

- 1. Admin enters into Admin panel after successful login.*
- 2. Admin clicks the tab "User Requests" in his panel.*
- 3. Depending upon valid user requests he approves or rejects the user requests.*

**3.1.18 Use case "User Account Management"****Initiator:**

*Admin*

**Goal:**

*Admin manages the user account from his admin control panel.*

**Main Scenario:**

- 1. Admin enters into Admin panel after successful login.*
- 2. Admin clicks on the "User Management" tab. Admin can do Addition , deletion of any user and also can block him/her.*
- 3. Admin clicks on the button "Make Changes" which successfully updates the database and necessary changes get implemented.*

**3.1.19 Use case "Forum Management"****Initiator:**

Admin

**Goal:**

Admin manages the use of forums, topics posted and discussions.

**Main Scenario:**

1. Admin enters into Admin panel after successful login.
2. Admin clicks on the "Forum Management" tab. He can control the access of specific users upon particular topics, can manage topics and discussions.
3. Admin clicks on the button "Make Changes" which successfully updates the database and necessary changes get implemented.

3.1.20 Use case "Admin Log Out"

**Initiator:**

Admin

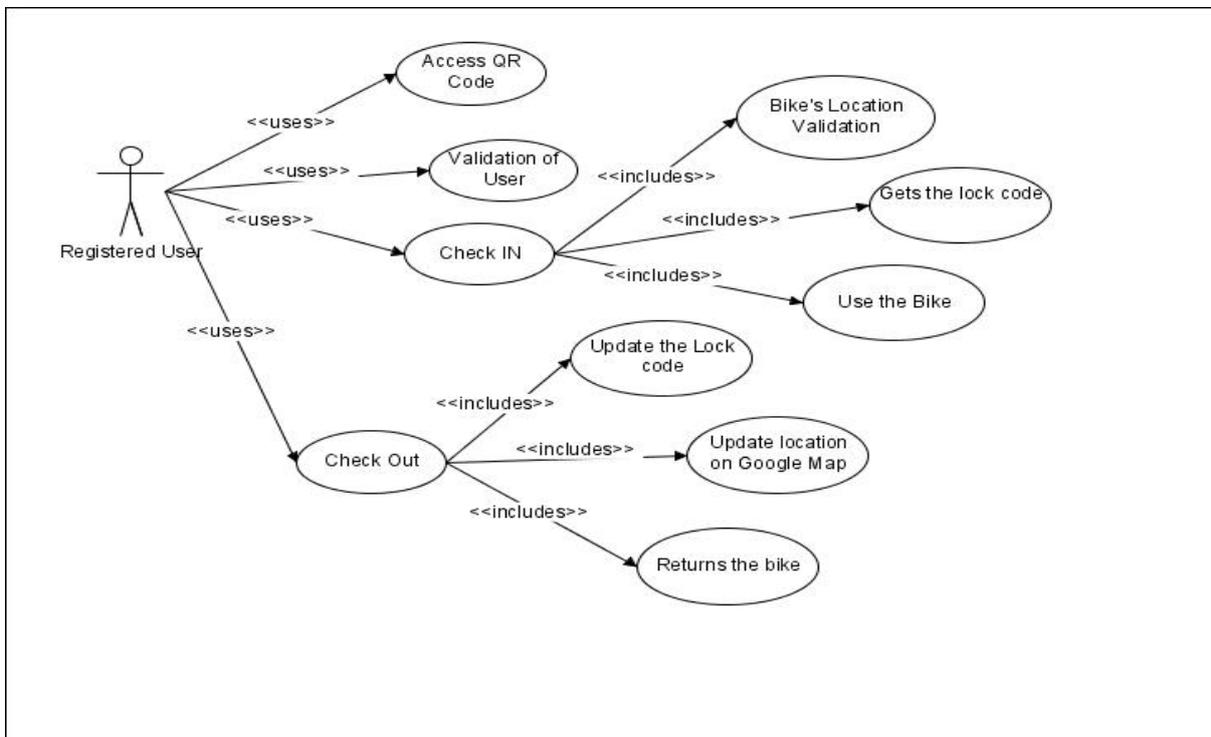
**Goal:**

Admin logs out from the system

**Main Scenario:**

1. Admin clicks on the "Logout" button
2. Admin gets logged out of the system and gets into the main page.

3.2 Use case model 2 – Wannabike Website (Mobile Access)



3.2.1 Use case "Access QR Code"

**Initiator:**

Register User

**Goal:**

*On seeing a bike if the user wants to take the bike he snaps the QR code image through the mobile phone and using QR reader gets into the Wannabike website.*

**Main Scenario:**

- 1. User sees a bike and decides to use it*
- 2. User snaps the QR code pasted in the bike and after reading it through a QR reader gets redirected to the Wannabike website.*

**3.2.2 Use case "Validation of User"**

**Initiator:**

*Register User*

**Goal:**

*Upon getting redirected to Wannabike website from mobile after reading the QR code from the bike the user needs to validate itself before he books the bike for use..*

**Main Scenario:**

- 1. User gets redirected to Wannabike website after reading the QR code of the bike*
- 2. User enters his password and the mobile number is taken as username and upon validation the website allows the user to enter into the bike booking panel.*

**Extensions:**

*If the user enters invalid password then the website will provide another 2 chances to the user, missing those will result to user account locking.*

**3.2.3 Use case "Check IN"**

**Initiator:**

*Register User*

**Goal:**

*It is the main booking page of the bike which a user can get through after successful login in to the website.*

**Main Scenario:**

- 1. User logs in after he has chosen a bike with the help of QR Code.*
- 2. User get into the book a bike tab where he/she is provided with details to use the bike and some general guidelines.*

**3.2.4 Use case "Bike's location Validation"**

**Initiator:**

*Register User*

**Goal:**

*Validation of the location of the bike.*

**Main Scenario:**

- 1. User get into the book a bike tab where he/she is provided with details to use the bike and some general guidelines.*
- 2. He/She is asked to provide the Bike's current Location.*
- 3. The System matches the user input with the Database results and if successful the system provides the user the lock code.*

**3.2.5 Use case "Get the lock code"**

**Initiator:**

*Register User*

**Goal:**

*The user is given the unique lock code to open the bike*

**Main Scenario:**

- 1. User get into the book a bike tab where he/she is provided with details to use the bike and some general guidelines.*
- 2. He/She is provided with the unique lock code to open the user marked cycle.*
- 3. He/She opens the bike combination lock with the help of lock code.*

**3.2.6 Use case "Use the bike"**

**Initiator:**

*Register User*

**Goal:**

*User uses the bike after successfully opening the combination lock of the bike.*

**Main Scenario:**

- 1. User logs in after he has chosen a bike to use with the help of QR Code.*
- 2. User opens the bike with the unique lock code provided to him/her and opens the bike and starts using it.*

**3.2.7 Use case "Check OUT"**

**Initiator:**

*Register User*

**Goal:**

*It is the main booking page of the bike where user can submit the bike after successful use.*

**Main Scenario:**

- 1. User logs in again during returning the bike.*
- 2. User gets the Check Out screen where the time of use of the bike and option for submitting it appears.*

**3.2.8 Use case "Update the Lock code"**

**Initiator:**

*Register User*

**Goal:**

*It's the module which comes after the user decides to check out.*

**Main Scenario:**

- 1. User logs in again during returning the bike.*
- 2. User gets the Check Out screen where he/she is provided with a unique lock code by the system to lock the bike at the place where its left.*
- 3. User locks the bike so that it is safe at that location.*

**3.2.9 Use case "Update Location on Google map"**

**Initiator:**

*Register User*

**Goal:**

*It is the main booking page of the bike where user can submit the bike after successful use.*

**Main Scenario:**

- 1. User logs in again during returning the bike.*
- 2. User locks the bike with the needed unique code and then click “Check out” button which in turn tell the user to mark the current location of the bike with the help of Google Maps.*
- 3. The user after marking the current location can check out from the system.*

**3.2.10 Use case “Return the Bike”**

**Initiator:**

*Register User*

**Goal:**

*This part helps the user to return the bike.*

**Main Scenario:**

- 1. User logs in again during returning the bike.*
- 2. User clicks on the “Return Bike” button and gets a option of marking his location on Google maps.*
- 3. User successfully returns the bike and checks out of the system after locking the bike with the new code provided.*

## **4. Requirements Definition**

### **4.1 Requirement Group Definitions**

<b>Identification</b>	<b>Requirement Group</b>	<b>Rem.</b>
WWW	Website	
RVM	Real and Virtual World	
GM	Google Maps	
GC	Communication between Members	
NF	Non Functional Requirement	

### **4.2 Requirement Sources**

<b>Source</b>	<b>Description</b>	<b>Rem.</b>
Ctm	Customer	
Sys	Required as a consequence of system design	

### 4.3 Requirements definitions

Identity	Status	Priority	Description	Source
			Website	
WWW-1	I	1	Create Website to make it accessible worldwide	Ctm
WWW-2	I	1	User Account Management	Sys
WWW-3	I	1	Bike Data Management	Sys
WWW-4	I	1	User 'Checks In' the system to take a bike	Sys
WWW-5	I	1	User 'Checks Out' of the system to park a bike	Sys
			Real and Virtual World	
RVM-1	I	1	Read QR Codes	Ctm
RVM-2	I	I	Assign QR Code to each bike	Sys
RVM-3	I	1	Create QR Codes with a Short text message	Ctm
			Google Maps	
GM-1	I	1	Integrate the website with Google maps	Ctm
GM-2	I	1	Search based on end user location	Sys
GM-3	I	1	Display locations of Bike on the map	Ctm
			Communication between Members	
GC-1	I	1	Use forums to create and reply to posts	Ctm
GC-2	I	2	Forum moderation	Sys
			Non Functional Requirements	
NF-1	I	1	The web site response should be <400ms	Ctm
NF-2	I	1	Wannabike mobile website should be optimized for viewing on QVGA mobile screen	Ctm

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).

## 5. Future Development

### 5.1 General Overview

The security aspect of the proposed solution can be improved upon further. Currently there is no fool proof solution to ensure that the end users don't steal the bike once they start using it after registering in the system.

### 5.2 Specific group 1

### 5.3 Specific group 2