

MIDDLE EAST TECHNICAL UNIVERSITY
COMPUTER ENGINEERING DEPARTMENT

ONLINE BARTER MARKET

SOFTWARE REQUIREMENTS SPECIFICATIONS (V 1.0)

LONESOME CODEBOYS

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Preface

This document includes the system requirements of online barter market project. The document is prepared according to the

[1] IEEE Std 830 – 1998

[2] IEEE Std 1233a - 1998.

The document gives a complete description of specifications and requirements of the online barter market system.

The first section explains purpose and scope of the document, gives definitions, acronyms, and abbreviations used throughout the document.

Overall description is given on the second section of the document. Product perspective, product functions, constraints, assumptions and dependencies subsections explain overall description of the document in detail.

The third section discuss about specific requirements which contains interface requirements, functional and non-functional requirements.

Data model and description is given on the fourth section of the document. Class diagrams are also given in this section.

The fifth section explains behavior of the system by giving state transition diagrams.

Final part of the document gives planning of team structure, basic schedule, process model and conclusion.

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1. Introduction

1.1 Problem Definition

Before the invention of the internet and mobile phones, when people want to reach a person or a friend, they have to see him/her and talk with them. Also, in those days, if people want to buy things, they would have to go to shops and buy things which they need. By the invention of the internet and mobile phones, people do not need to see the person who they want to talk with. They can send an email or make a phone call. These technologies have changed our lives a lot. For instance, today, we can reach our friends easily via internet or what information we need even if it is about the far corner of the world via internet. It proves that internet has become very important for us today.

Another effect of the internet and technology is online shopping. We have started to use online shops a lot in the last years. Nowadays, online marketing has become a large business. There are so many websites that provide us with a tool that can ease our need to purchase everything from everywhere through online. For instance, clothes that are originally made from Italy can be bought by just one click and will be directly sent to your house. Sometimes, it offers you with free shipping too so that you only have to pay for the product that you purchase. However, all these kinds of website use cash or money for purchasing the product. How about people who are short of money or they cannot afford to buy the goods that they need but they have something that can be exchanged.

Barter is a system of exchange by which goods are directly exchanged for other goods without using medium of exchange, such as money. This kind of system has never been found in electronic form like those websites we described before. That's why, we come up with the idea to build a web base application that specially used in order to help people to exchange their belonging with someone else. For instance, people generally have goods that are not used anymore. Instead of selling it or throwing it up, they can use this website to exchange it with another person who might need it and get something that might be useful for them.

1.2 Purpose

Purpose of this software requirement specification document is providing a complete description of the features which will be implemented in this online barter market project as well as explaining working principles of the system both for users and for developers of the project.

As it is described before, intended audiences of this document are users, system developers and test team since use case diagrams of the system can provide a visual description of the system for users, class diagrams can help developers to build the system in object-oriented manner. Also, test team can define test scenarios based on use cases described in this document.

1.3 Scope

As it is described in problem definition section, Turkey does not have an online barter market system which people can share their goods. This situation leads to inefficient way of using our stuff and waste of resources and money.

An online barter market system provides an online platform which people can exchange their goods in an easy way. This results in efficient way of using resources.

Our system is an online barter system which is intended to solve the problems described above. The system provides an online platform people can register easily and after registration process, they can easily look for goods they need or they can exchange their spare goods. Either way users can benefit from the system. If a user needs an item, he/she searches suitable categories and picks the necessary item. Then the system determines the nearest items available for the user. After that, the system shows the user the nearest item.

Moreover, the system will show who took the item, if the item is already taken and item categories. People can also rate each other and this can give other users and quality managers a valuable feedback of the system.

Since this system does not involve money or credit cards for exchanges, people can use it safely without being afraid of being deceived.

Furthermore, people in close geospatial locations can create good relationships with each other by using Share for Good.

1.4 Definitions, Acronyms and Abbreviations

Terms	Definitions
IEEE	Institute of Electrical and Electronics Engineers
Online Barter Market	Name of the system given by our group members
User	A person who uses the system
GUI	Graphical user interface
Stuff/Good/Item	People's possessions that are shared, given or exchanged on the system
SRS	Software Requirements Specification
OS	Operating System(s)

Table 1: Terms and Definitions

1.5 User and Literature Survey

In Turkey, there is no online barter market application. So, this online barter market will be the first one of its kind. However, in the world there are similar applications. Some of them are:

[5] Nextdoor: It is an application sharing almost everything with your neighbors rather than just exchanging goods. It is like a social network that you can find a babysitter, comment on a restaurant etc.

However, Nextdoor is more than a barter market application, it is like social neighbourhood network such that you can add friends, organize parties or social events rather than just sharing goods.

Good aspects of the website:

- User friendly interface,
- Close and strong communication alternatives (chat, private messaging etc.),
- Showing locations on maps.

[6] Neighborgoods: neighborgood.net is an online market based on barter method. It is somehow almost the same like what we are trying to develop in our project with little differences. It helps people find things they need by connecting them to people who already own them. Thus, you can save money by sharing stuff with someone. The best feature that we found in this website is “Help out your neighbors!” So, instead of searching for the item or adding the item, Users can also ask for something that they need which maybe aren’t available in the item library of the website. Thus, when other users who have the item saw this section of the website they can directly contact them and lend it. In our application, we don’t have this kind of feature. Guest or visitor can only borrow or search for item that they can find in the website library. They cannot ask for the item that they want. From our research of this website, the service of the website only focus in America which almost the same like what we are trying to develop as our user target market is Turkish people.

Good aspect of the website are:

- You can ask for an item that you are seeking.
- They provide map to locate our location
- They provide useful button in the website to ease visitor or guest to borrow or to tell the other that we have the item on need the item. So, no need to contact the user directly by email or private message to inform them.
- Guest can write the feedback to the user post.

- Create a group where you can share you item privately.
- You can sort the list of the item by newest, rating, alphabetical and distance.

[7] u-exchange.com: u-exchange is also a web based application which use barter method as their system to trade item. The idea that we are trying to build to make an online barter market is portrait in this website. In other words, it is almost the same like our idea. The best feature that we can found from this website is that the search engine of this website can be customized depends on our need. There are two tabs that you can choose in order to get the list of items from this website. First one is view list based on your location and the second one using keyword search which you can customize by specifying the member you are seeking, the category of item and so on. The list of the item is also impressive. On the list you can see the list of the name, city, what users offer, and what users are seeking. In fact, you can find out whether the user is still active or away by looking at the icon next to the name of the user. If it is green, it means that the user is active otherwise he/she is away.

Good aspect of the website:

- Search engine is customizable
- There are two ways to get list of item. Using your location and keyword search.
- Can find out whether the user is active or not by the icon next to their name.

[8] my.freecycle.org: my.freecycle.org is also a web based application which using barter method. It's all about reuse and keeping good stuff out of landfills in the neighborhood. In order to use this website you cannot directly search for items before you login and join the group. The group generally is a community of people around your neighborhood or your town.

Good aspect of the website:

- User will be force to be in a community where they can get closer to people in their neighborhood.

Bad aspect of the website

- You can only search for item in the group that you join.

- It is lack of picture of an item.
- It is not truly barter online market because there is a store tabs on the home page where you can buy stuff.

[9] rehashclothes.com: rehashclothe.com is also web based application that use barter method. They call it rehash instead of exchange. Rehashing is a fashionable way for you to trade your clothing, accessories, and books with others online. You can join groups, socialize, and get fashion, book, and green living tips. By rehashing, you can shop for clothes without spending penny, all while helping the environment.

Good aspect of website:

- The website has a theme and objective.
- Can request and offer more than one item to exchange at a time.

Bad aspect of website

- You can only exchange clothes and books.
- It is hard to find someone near you to exchange because it doesn't use geospatial search.

1.6 References

[1] IEEE STD 830-1998, IEEE Recommended Practice for Software Requirements Specifications

[2] IEEE STD 1233-1998, IEEE Guide for Developing System Requirements Specifications

[3] Pressman, R. S., *Software Engineering*, McGraw-Hill, 3rd Edition

[4] Booch, G., Rumbaugh J., Jacobson I., *The Unified Modeling Language User Guide*, Addison Wesley

[5] www.nextdoor.com/

[6] www.neighborgoods.net/

[6] www.u-exchange.com/

[6] www.my.freecycle.org/

[6] www.rehashclothes.com/

1.7 Overview

This SRS document is prepared to explain all detailed information about overall system description, functional, non-functional and specific requirements, data and behavioral model description of the system.

This document basically consists of three parts;

- The first part includes introduction and overall description of the Share for Good system. Section 1 and 2 consist of the first part.
- The second part contains specific requirements, data and behavioral model description of the system which are section 3, 4 and 5 in the document.
- Last part gives planning, conclusion and supporting information about the system. Section 6, 7 and 8 explain these features in detail.

2. Overall Description

This section of the SRS document provides an overall description for system and its requirements and enables a basis for specific requirements which are explained in the third section.

2.1 Product Perspective

This barter market is an online application which is self-contained and it is not a part of a larger system.

2.1.1 System Interfaces

The system will be built according to the model-view-controller architecture, so there will be three system interfaces which are GUI, business logic and database **[4]**:

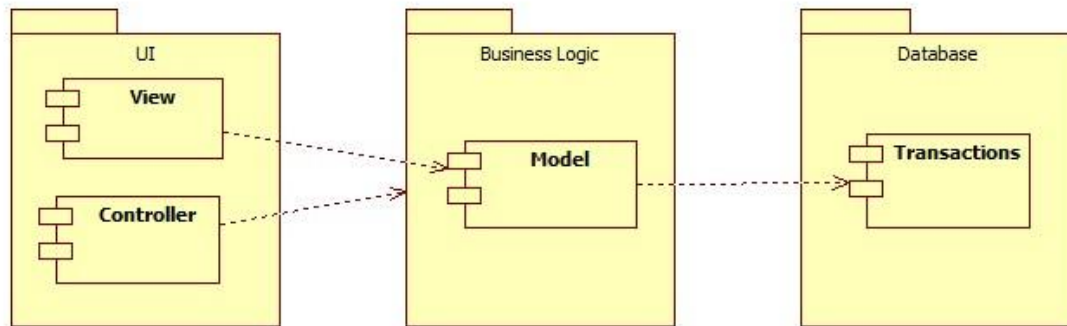


Figure 1: Component Diagram of the System

2.1.2 User Interfaces

The system will have only one kind of user type, so there will not be any functional differences between users. That's why; there will be just one user interface for the system. This interface will allow user to access the application, selecting desired item, rating other users, searching categories and quit any time by just clicking necessary buttons.

2.1.3 Hardware Interfaces

The system will not use any specific hardware component, regular PCs, phones or tablets will be enough for using the online barter market application.

2.1.4 Software Interfaces

In terms of software interfaces, the application will be able run on different OS and different machines because it will run on any browser and this feature makes it platform and machine independent.

2.1.5 Memory

Since the application will run on browser, there will not be any need to install a program to the computer, phone or tablet. Thus, the system will not consume primary or secondary memory than needed.

2.1.6 Communication Interfaces

Communication interface will be between server and business logic. After getting information from the user, business logic will access server through network protocols and will produce some queries for database. After getting query results, business logic will display the results on GUI, and the user will see that information.

2.2 Product Functions

Online barter market is a web-based application where users can search goods or meet people in order to exchange what they have with what they need. Users can exchange it permanently or they can just make an agreement to lend their belonging for a while. Moreover, it provides communication between users of the site in order to exchange information such as contact information to facilitate trading between users. It will also support geospatial searching where users can easily find someone around them to exchange. In other word, users will not get someone that is too far away from them while searching for goods. Users will be able to create and manage site accounts, as well as post and manage their goods that they want to exchange. The goods and posts will be classified into categories for easier product searching. Private message will also be included in the site to allow communication between users. Any messages sent to a user will be saved and available to the user at a later time.

2.2.1 User Use Case Diagrams

Here is a user use case diagram of the product that we are going to build [3]:

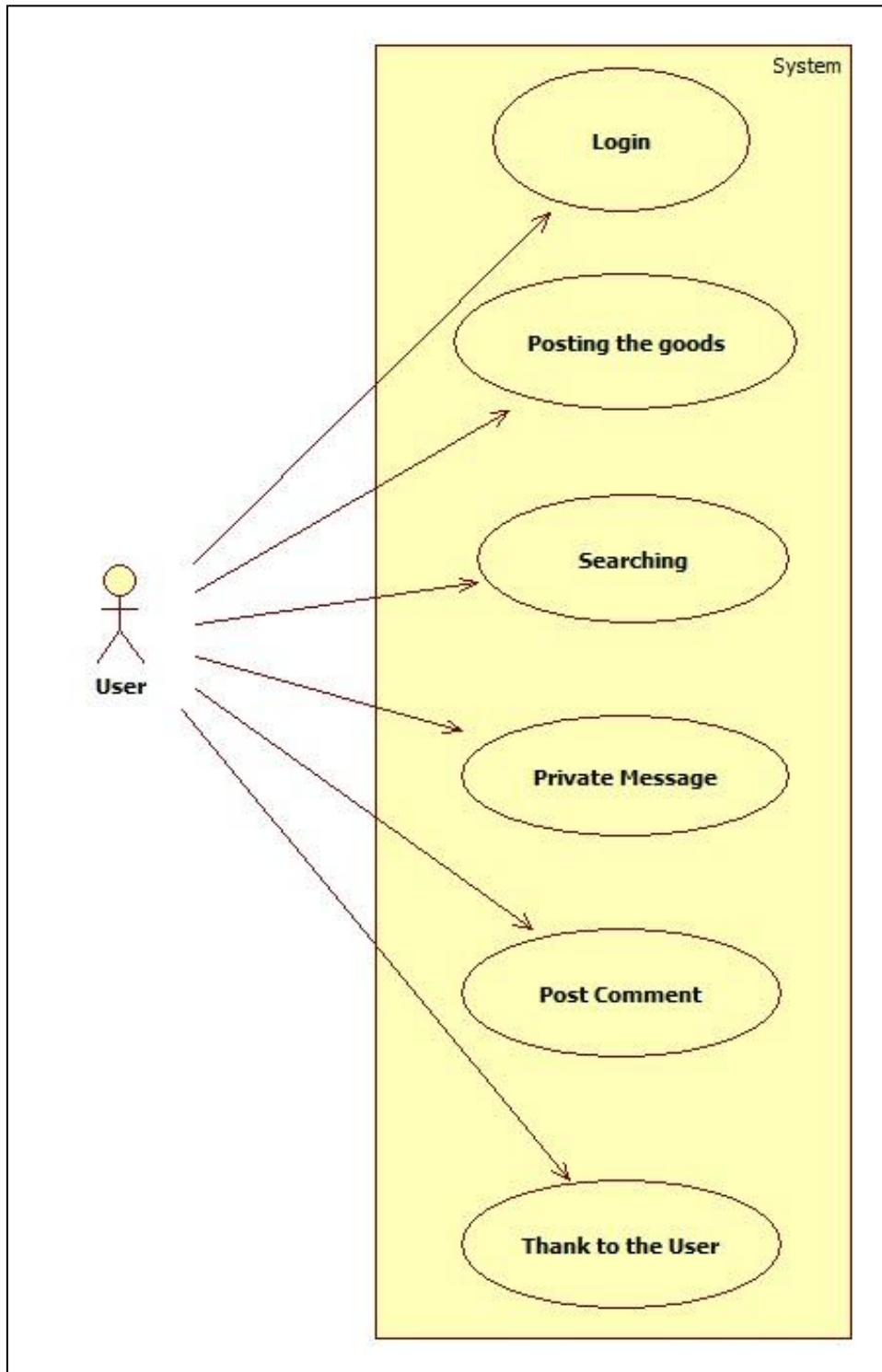


Figure 2: Use Case Diagram for User

- **Login**

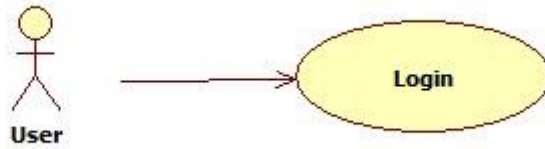


Figure 3: Login Case

Users will be asked to login to the system before they can post the goods. By login to the system users can maintain their post such as delete post, create a new post, reply the comment that guest post and also take a look at the rating the guest give.

- **Posting the Goods**

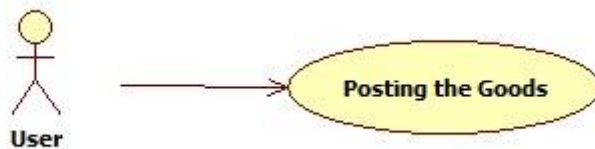


Figure 4: Posting Case

This function will allow user to post their goods that they want to exchange in a category that we will provide and also user need to specify their location. Furthermore, item location, item description, item photograph, item status (whether it is given for free or it should be exchanged with something etc.)

- **Searching**

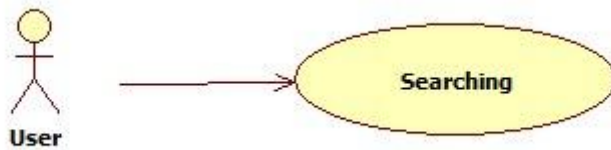


Figure 5: Searching Case

This function allow user to search goods that they want around them using geospatial search and according to search results users can pick the closest items to themselves. Also users can search users according to their usernames.

- **Private Message**

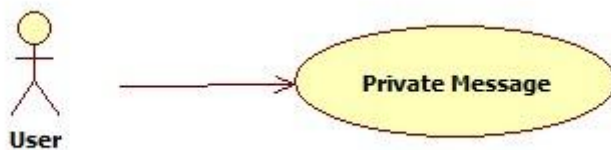


Figure 6: Message Case

This function will allow user to send or reply a private message to the guest.

- **Post Comment**

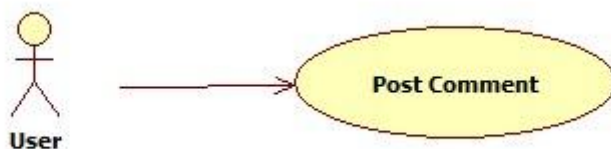


Figure 7: Comment Case

This function will allow user to give a comment to user page.

- **Thank to the User**

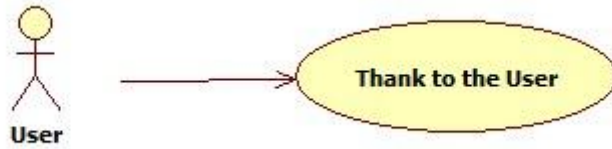


Figure 8: Thanks Case

This function enables users to thank the other users by using private messaging system.

2.2.2 Guest Use Case Diagrams

Here is a guest use case diagram of the product that we are going to build:

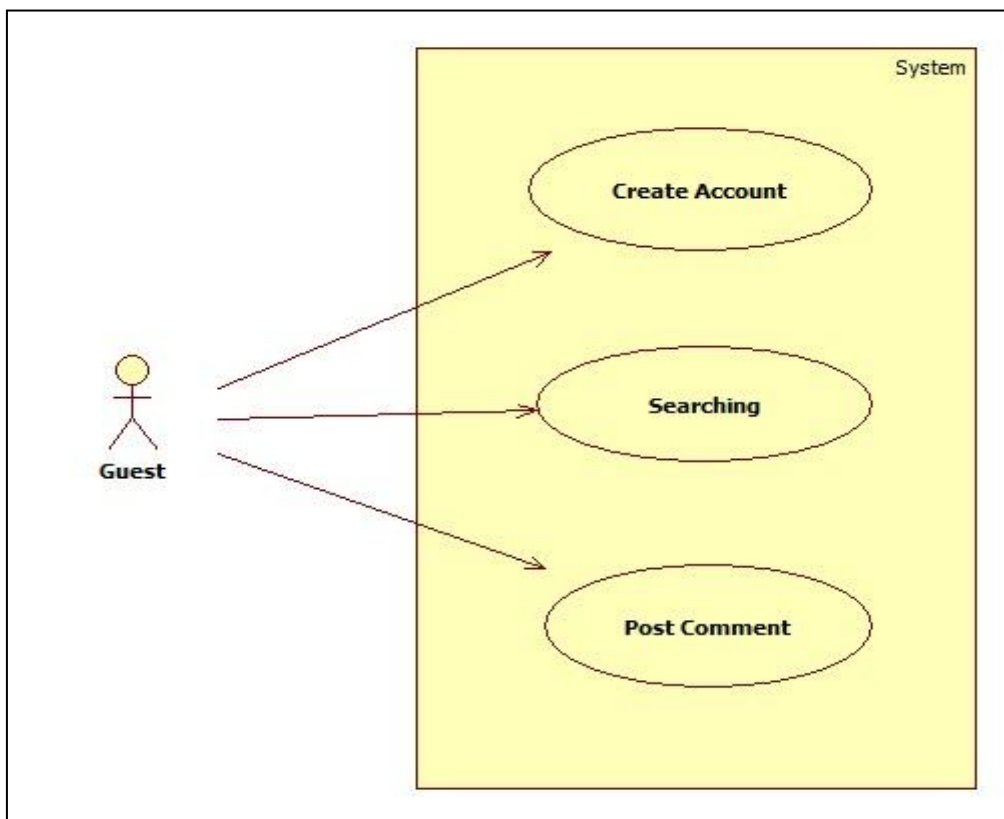


Figure 9: Guest Use Case Diagram

Searching and post comment cases are the same as the user use case diagram

- **Create Account**

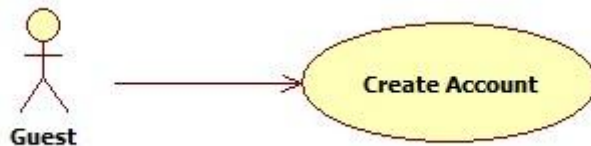


Figure 10: Create Account Case

Guests need to make an account first before they can post any goods that he wants to exchange. Otherwise he will only be treated like a visitor by a system.

2.3 Constraints

Our online barter market is a web-based application. Therefore, User and Guest need an Internet browser such as Mozilla Firefox or Google Chrome and also connection to the Internet in order to open the application. The server will keep data like the information of the user and will keep it secure against malicious deformations. Our website's loading and response time depend on the user's network speed.

2.4 Assumption and dependencies

- It is recommended that the user have a broadband connection when using the photo sharing functionality.
- User should be accessing the site through a desktop, laptop, a mobile phone device or tablet.
- The site's primary language of operation is Turkish.

3 Specific Requirements

This section explain the specific requirements in detail, which are interface, functional and non-functional

3.1 Interface Requirements

3.1.1 User User Interface

- When the application starts, login page will be displayed. There will be two options that are register and login.
- For registration, user email address, username, real name, password, country, city and county information will be asked.
- After registration, the user will be directed to profile page.
- After logging in, main page will be displayed. User information, profile, messages and search box will be shown on this page.
- When edit profile link is clicked, the profile edit page will be displayed.
- When requested items link is clicked, all of the requested items will be shown.
- When search bar is typed with the keyword, it will show the related items.

3.2 Functional Requirements

3.2.1 Register User

Use Case Name	RegisterUser
ID	1
Priority	High
Actor	User
Description	The system will generate a new account for the user
Flow of Events	<ol style="list-style-type: none"> 1. User opens application 2. Login page appears and user clicks register button 3. User enters necessary information for registration 4. Register is completed

Table 2: Register User Function

3.2.2 Login User

Use Case Name	LoginUser
ID	2
Priority	High
Actor	User
Description	The system will confirm user information, and lets the user login to the system
Flow of Events	<ol style="list-style-type: none"> 1. User opens application 2. Login page shows up, user enters e-mail address and password 3. User clicks login button 4. User page is displayed

Table 3: Login User Function

3.2.3 Add Item

Use Case Name	AddItem
ID	3
Priority	High
Actor	User
Description	User adds item to the system
Flow of Events	<ol style="list-style-type: none"> 1. User login to the system 2. User enters item information 3. User clicks add button 4. The system will add item information to the database

*Table 4: Add Item Function***3.2.4 Remove Item**

Use Case Name	RemoveItem
ID	4
Priority	High
Actor	User
Description	User removes an item
Flow of Events	<ol style="list-style-type: none"> 1. User logs in to the system 2. User removes the desired item from an item list by clicking remove button 3. The system will remove information about that item from the database

Table 5: Remove Item Function

3.2.5 Search Item

Use Case Name	SearchItem
ID	5
Priority	High
Actor	User
Description	User searches an item
Flow of Events	<ol style="list-style-type: none"> 1. User logins to the system 2. User searches desired item by writing its name on the search box 3. Found items will appear on the page

*Table 6: Search Item Function***3.2.6 Search User**

Use Case Name	SearchUser
ID:	6
Priority:	High
Actor:	User
Description:	User searches another users
Flow of Events:	<ol style="list-style-type: none"> 1. User logins to the system 2. User enters geospatial information and clicks search button 3. Found users are appeared on the page

Table 7: Search User Function

3.2.7 Edit Profile

Use Case Name	EditProfile
ID	7
Priority	High
Actor	User
Description	User edits his/her profile
Flow of Events	<ol style="list-style-type: none"> 1. User logs in to the system 2. User clicks edit profile button 3. User can change his/her profile information except username and e-mail address 4. New settings are applied after user clicks save button

Table 8: Edit Profile Function

3.3 Non-functional Requirements

3.3.1 Performance Requirements

Performance is important for our system because our application will response close to the real time. Login page should be displayed within 2-3 seconds. This assumed response time is determined according to the average network speed.

Also, our database should be big and fast enough to keep user, item information, messages. Server response time depends on the size of data on database.

Response time of searching an item also depends on the network speed and the data size. Searching time may last longer compare to page loading response time.

3.3.2 Design Constraints

Usability: Usability is an important feature of our application so that users can benefit from our system in an easy way. Our user interface is also going to be user-friendly. By the help of that, users are going to handle operations like sending message to another user or seeing items effectively. Briefly, our system needs to be useful so that users are going to reach our system's functionality.

Security: Security is an important feature for our system too. We will apply register and login mechanism. In other words, users have to enter their username and password before using our market. If these two variables are not correct, the system does not allow the user for using the market.

Portability: The application will be platform independent. It will work on different operating systems such as Windows, Linux and MacOS successfully. Also, it will work on mobile devices and tablets as well as personal computers.

Reliability: Reliability is another feature of our application. The user of the system needs to get the results of requests correctly in a suitable time. For example, when the user wants to edit his/her profile information, they should be able to edit the info in a certain time. Also, when the user searches an item, he/she should see the results in a desirable time.

Scalability: Our system's scalability is measured by the data on the database. Even if size of data on the database changes increasingly, the system quality should be kept close to the average performance.

4 Data Model and Descriptions

4.1 Data Description

This section will give information about the data objects managed by this project and relations among them.

4.1.1 Data Objects

We can describe our data objects as following table;

Login: userEmail, password

User: name, username, email, country, city, county

Item: itemID, itemName, itemCountry, itemCity, itemCounty

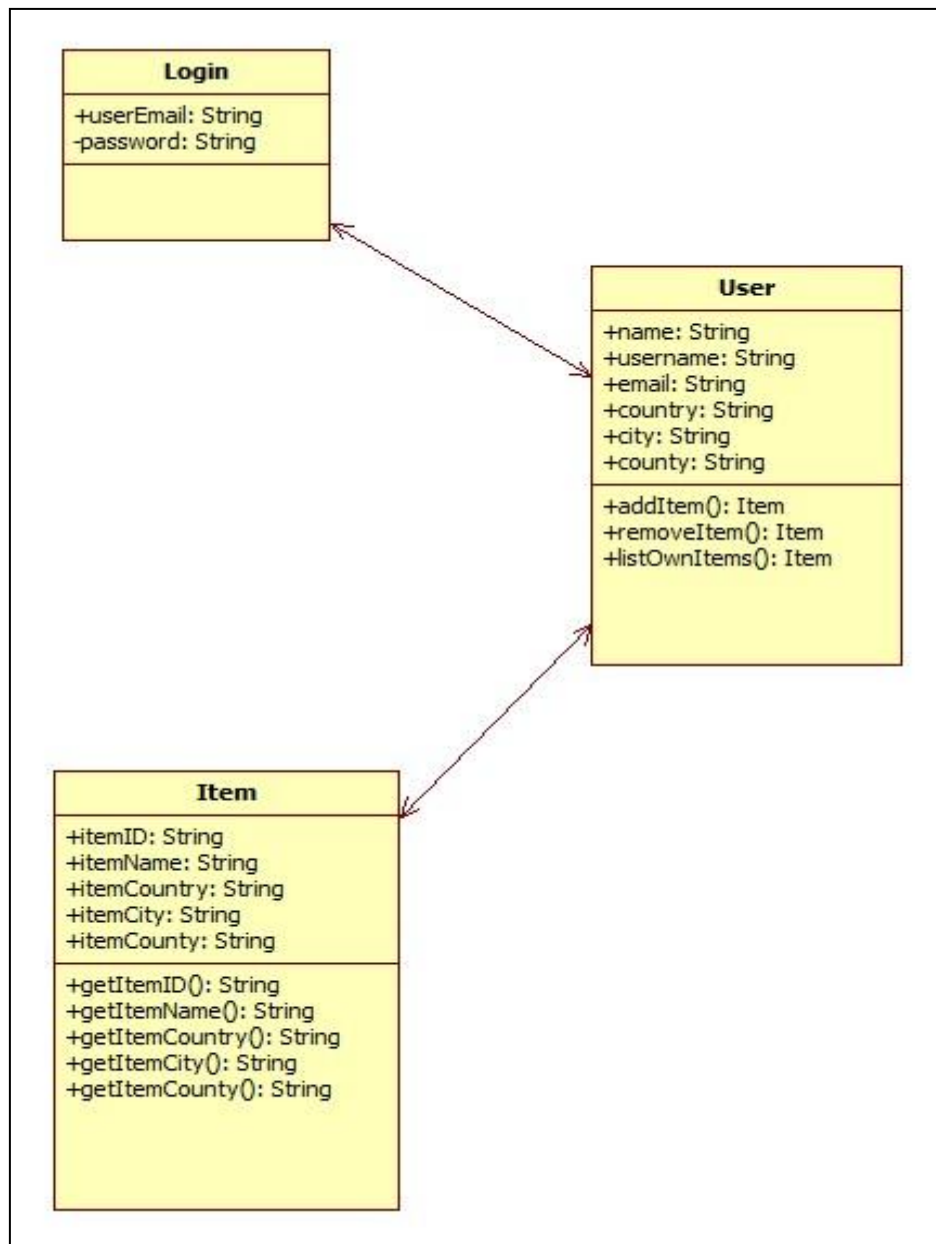


Figure 11: Class Diagram

4.1.2 Data Dictionary

Below table represents the definitions about main data objects of our project.

TITLE	DESCRIPTION	TYPE
userEmail	Unique email for login	String
password	Every user has to have a password to login	String
name	Real name of user	String
username	Unique username for every user	String
country	User's country	String
city	User's city	String
county	User's county	String
itemID	Unique item ID	String
itemName	Item Name	String

Table 9: Data Dictionary

5 Behavioral Model and Description

This section explains the description and behavior of the software

5.1 Description for the Software Behavior

In order to exchange goods on our online market, users need to register. However, guests can see the items, item categories and item locations. For example, these guests cannot add or borrow an item from our market without registration. In registration, we ask users their real names, usernames, email addresses, countries, cities and counties. After registration, every user has individual accounts. Users can update their profile. They can add items or borrow items from other users. Also, users can search items with location information. With this feature, users are able to find items closest to them. Also, users can search other users with location information.

5.2 State Transition Diagrams

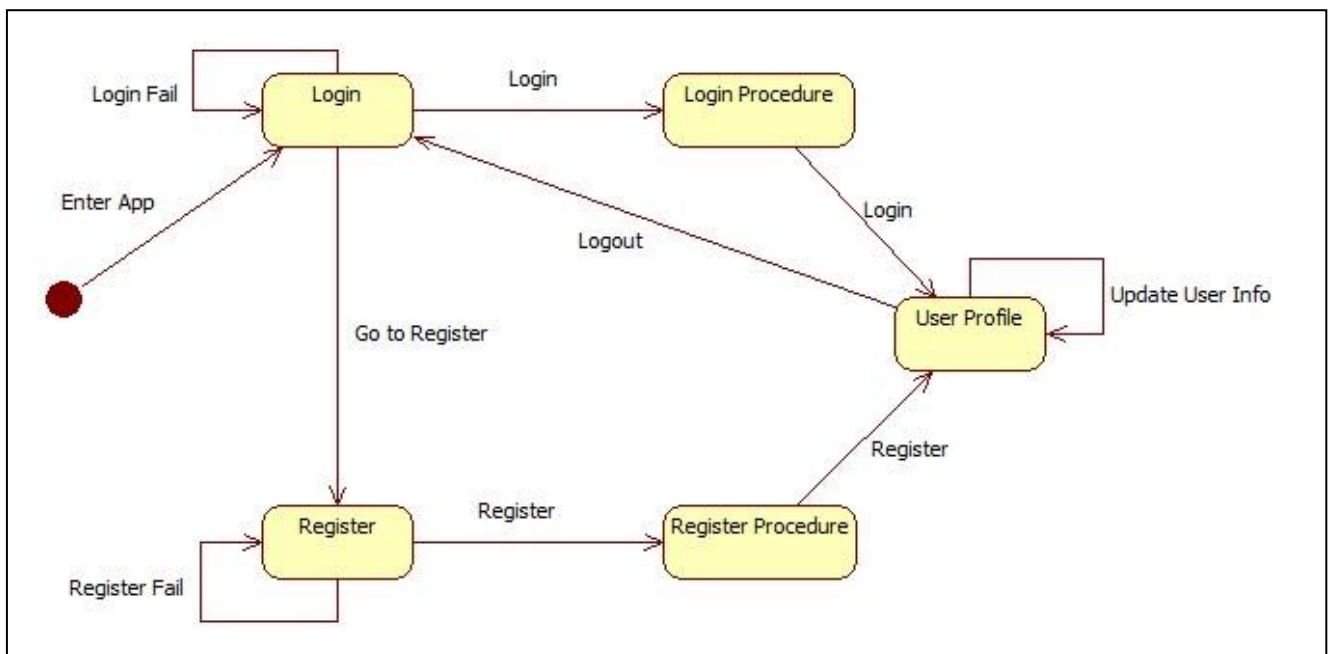


Figure 12: State Transition Diagram [4] for Login and Register

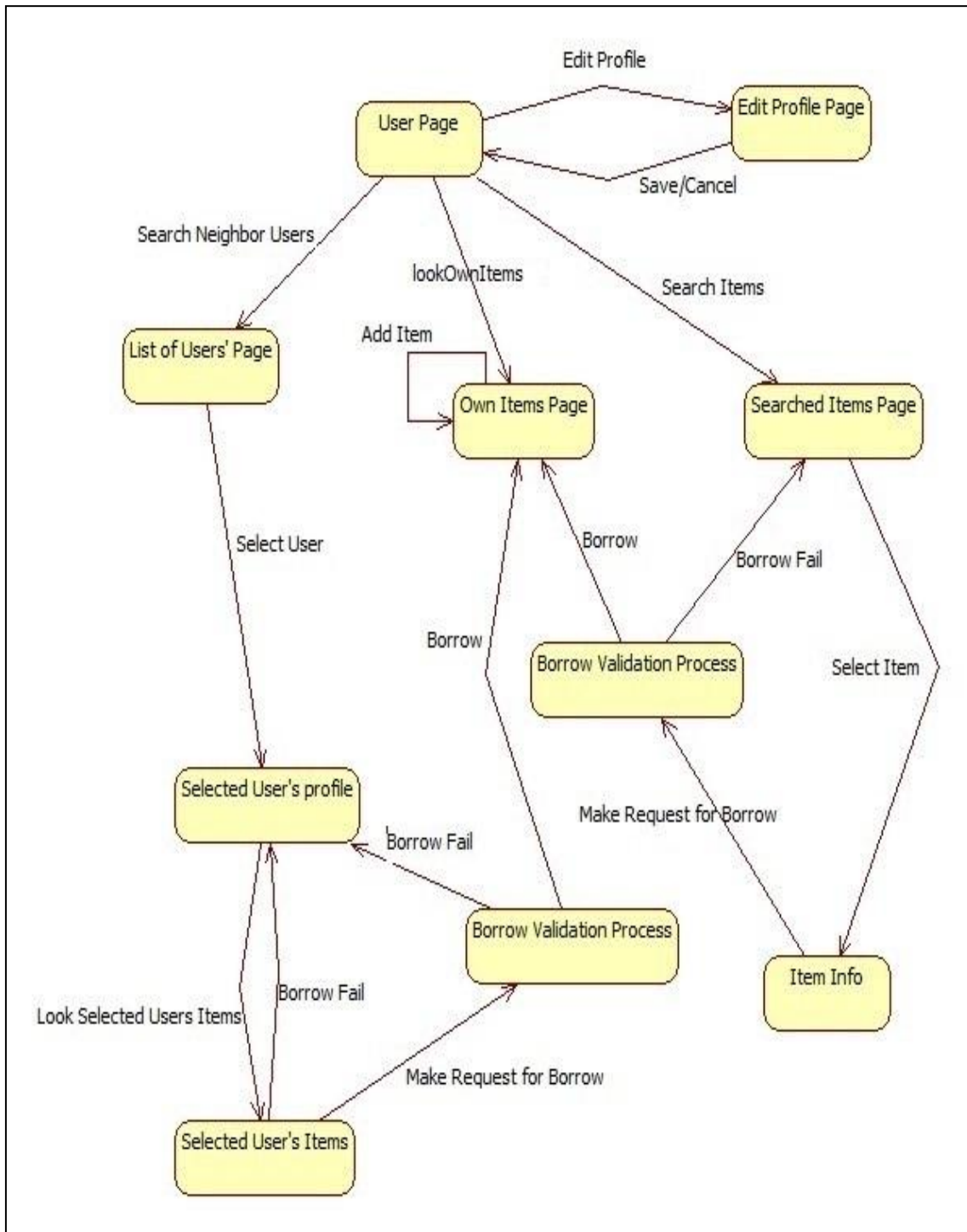


Figure 13: State Transition Diagram for Registered Users

6 Planning

6.1 Team Structure

Emre Deniz, Ali Can Batur, İsmail Sarp Dikkaya and Donny Irawan Bulhadie are the members of our team. Everyone has equal rights through our development process. We do not need a leader because we are always in touch and talk about the project topics together. We put our ideas together to make overall design of the project. Although we mentioned in our project proposal document that every member will be responsible for different parts of the project, we decided to make everyone contribute to every part of the project equally. As a result of this decision, our team structure will be “democratic de-centralized”. We plan to share works evenly.

6.2 Estimation (Basic Schedule)

Although software test design and implementation deadlines are not certain, software requirements specification and software design document deadlines are clear. Also our team determined some major steps to be taken at which time. Some essential steps are: implementation of user interfaces, login, register, message sending/receiving procedures etc. Therefore, our basic schedule is shown on the graph below;

Schedule

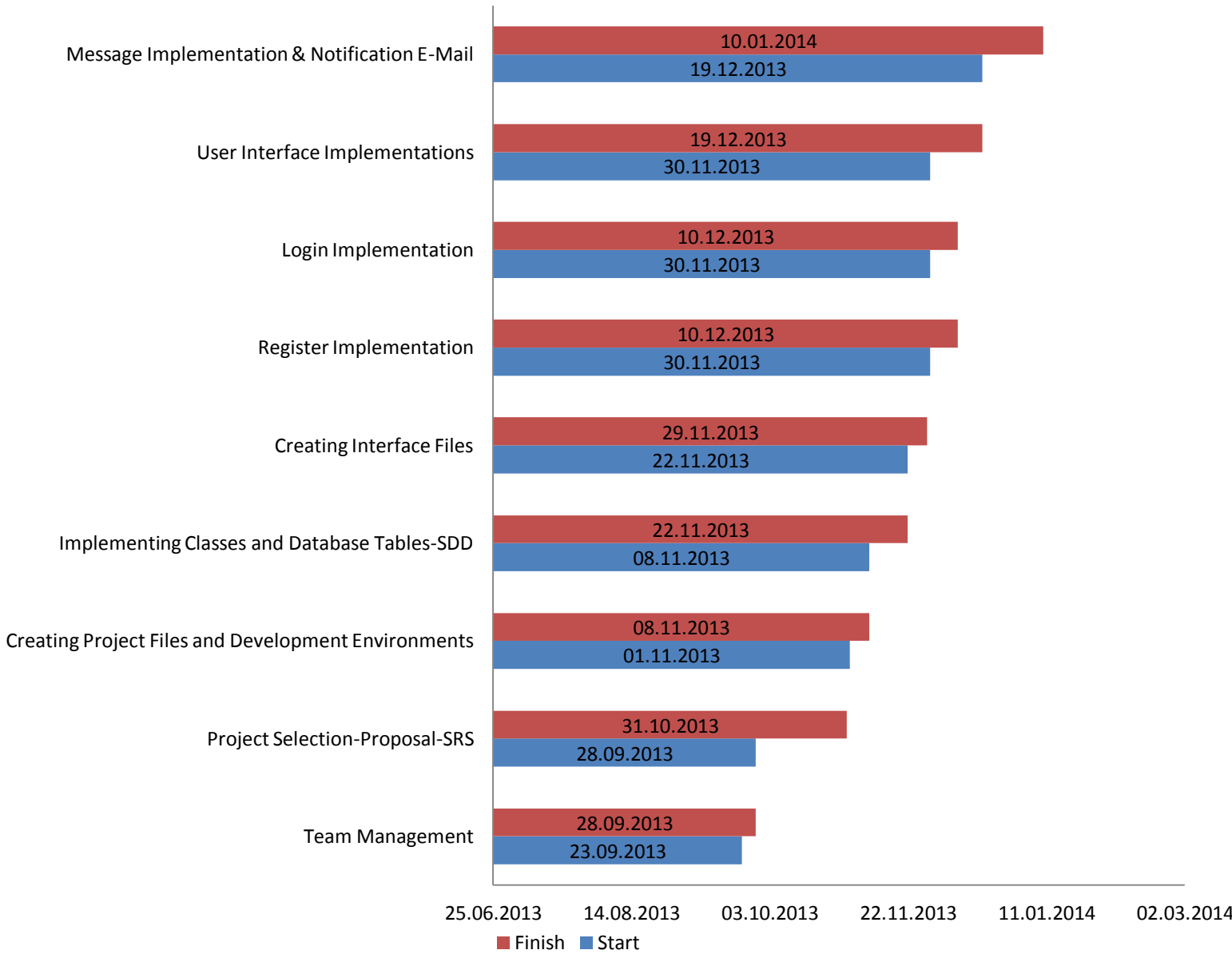


Figure 14: Basic Schedule Chart

6.3 Process Model

Since our system is not subjected to big changes, we decided to use waterfall model as our software development process model.

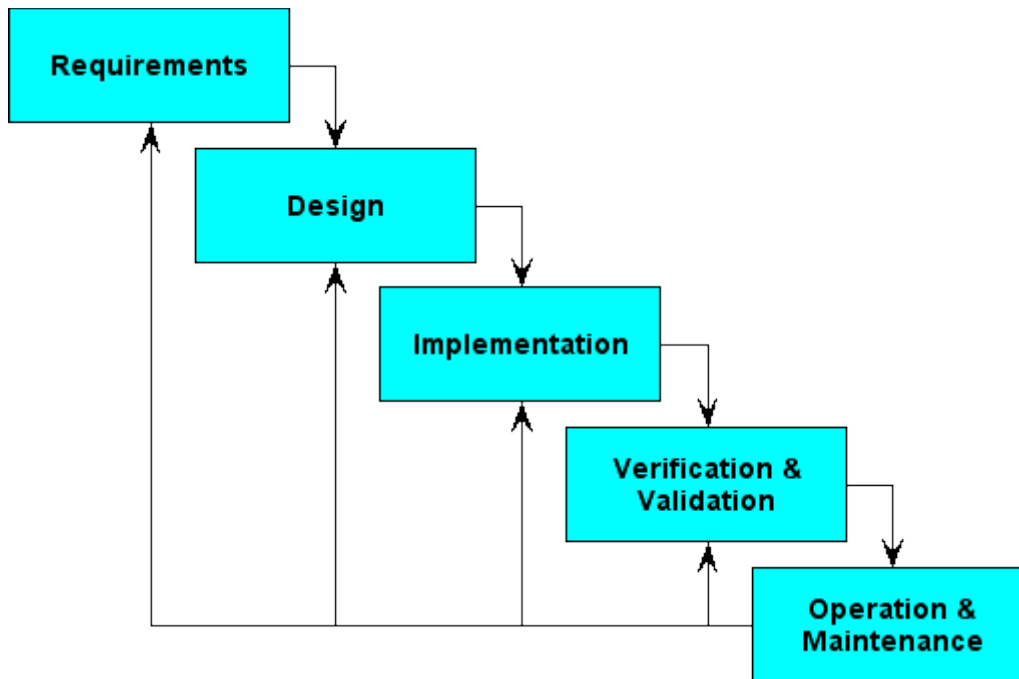


Figure 15: Waterfall Model

7 Conclusion

This SRS document provides detailed information about overall description of the project. It explains all requirements which are functional, non-functional and specific. Also, it contains use case, class and state transition diagrams for allowing users and system designers to understand how to use and how to design the system. Lastly, it gives information about our team structure, software process model and basic schedule.