Hacettepe University
Department of Computer Engineering
BBM478 - Software Engineering Laboratory

System-Wide Requirements Specification

Group One

Ahmed Şamil BÜLBÜL (21426749, Software Architect)
Halil İbrahim ŞENER (21328447, Project Manager)
Naciye GÜZEL (21580841, Software Analyst)

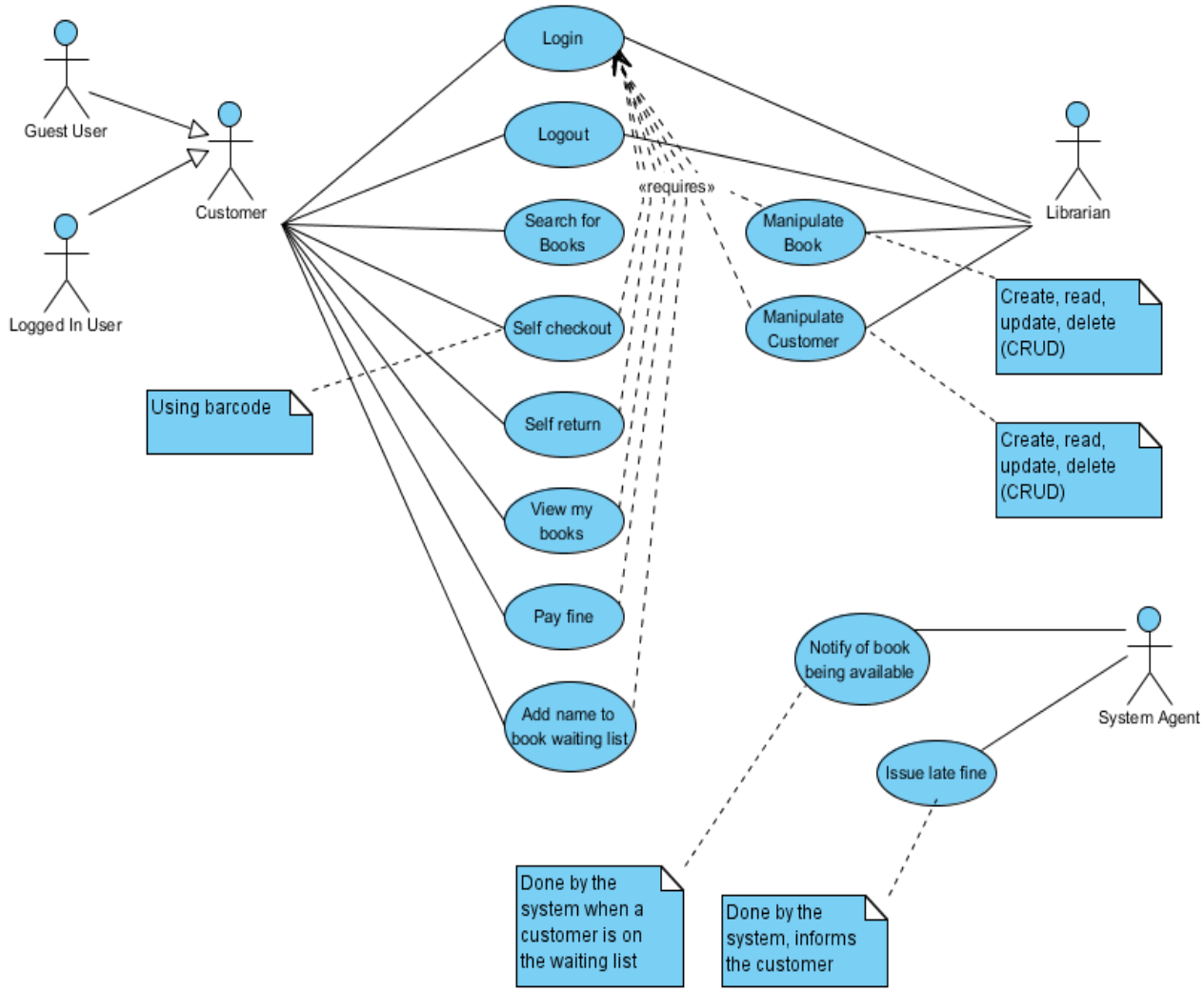
Library Book Loan System
System-Wide Requirements Specification

1. Introduction

This document introduces the system-wide requirements of Library Book Loan System (LBLS) project. The functionality and requirements specified for the LBLS will be described in this document. LBLS is required to provide a better and efficient system for library users so requirements and functionalities are specified according to them.

2. System-Wide Functional Requirements

The system's use case diagram is as below:



Use cases and their unique numbers are given in the table below. To get tabular descriptions of them please check Appendix A. Data model of the system will be given in Appendix C.

Use Case	Use Case Number	Use Case Code
Login	1	LBLS-UC-001
Logout	2	LBLS-UC-002
Search for Books	3 (3.1 and 3.2)	LBLS-UC-003-1, LBLS-UC-003-2
Self Checkout	4	LBLS-UC-004
Self Return	5	LBLS-UC-005
View my books	6	LBLS-UC-006
Pay fine	7	LBLS-UC-007
Add name to book waiting list	8	LBLS-UC-008
Create Customer (Manipulate Customer)	9	LBLS-UC-009
Update Customer (Manipulate Customer)	10	LBLS-UC-010
Delete Customer (Manipulate Customer)	11	LBLS-UC-011
View Customer (Manipulate Customer)	12	LBLS-UC-012
Create Book (Manipulate Book)	13	LBLS-UC-013
Update Book (Manipulate Book)	14	LBLS-UC-014
Delete Book (Manipulate Book)	15	LBLS-UC-015
View Book (Manipulate Book)	16	LBLS-UC-016

- The customer shall be able to access the system as a logged in or a guest customer.
- The logged in customer shall be able to access more functionality than the guest customer.
- The customer shall be able to login to the system.
- The logged in customer shall be able to logout the system.
- The guest customer shall only have the ability to search for books.
- The logged in customer shall be able to search for books as well.
- The logged in customer shall be able to self checkout books.
- The logged in customer shall be able to self return books.
- The logged in customer shall have the ability to view his/her books.
- The logged in customer shall have the ability to view his/her fines.
- The logged in customer shall have the ability to pay his/her fines.
- The logged in customer shall have the ability to add a book to the waitlist to get notified when the book is available.
- The librarian shall be able to manipulate books.
- The librarian shall be able to manipulate customers.
- The system shall be able to issue a late fine to a customer when the customer returned a book late.

3. System Qualities

There are system qualities that are usability, reliability, performance and supportability in the system.

3.1 Usability

- The user shall be able to reach any use case functions from the main window at most 2 clicks.
- The user shall be able to reach the main window from other opened windows.
- The user shall be able to navigate from one window to another easily.
- The system shall show whether the user's operation is successful.
- The application uses default look and feels of the operating system, which increases the harmony of the application with the operating system and increases usability by increasing familiarity.
- The tasks and operations are categorized in windows and tabs to provide better usage of the application. Tabs and different windows provide understandability and ease of learning.

3.2 Reliability

- The system and the database connections shall be solid.
- The system shall be available to used by different types of users.
- The system shall let many users to login and logout without adverse conditions.
- The guest user or logged in user shall have their functionalities working properly.
- By release 1, the LBLS shall provide actors a minimum operational availability of 1 use case.
- By release 2, the LBLS shall provide actors a minimum operational availability of 6 use cases.
- By release 3, the LBLS shall provide actors a minimum operational availability of all use cases.
- The LBLS shall run 7 days a week, 24 hours a day.
- The users of the system shall have secure access to the system.

3.3 Performance

- All responses of the LBLS shall occur within 5 seconds
- The LBLS shall support multiple users to operate on the system.
- The user shall be able to find searched book (if there is) within 5 seconds.
- The LBLS shall resolve locking issues.
- The LBLS shall handle concurrent use of the system.

3.4 Supportability

- Planning and developing the application in Java and using object oriented programming effectively will provide maintainable code.
- Periodically, maintenance of the software application will be performed.
- The mean fixing time of LBLS shall not exceed one day.
- Users of the system shall be provided to have a manual to understand and use system.

4. System Interfaces

4.1 User Interfaces

The user interface that is user-friendly is described according to the requirements. It supplies all of the needs. The designed user interface is added in Appendix B document.

4.1.1 Look & Feel

The look and feel of the interfaces are about giving users a native application experience. Users need an

unobtrusive experience. Things are needed to be simple and well designed. To accomplish that, functionalities are divided into different windows or tabs. Also, the application uses the operating system's default look and feel to provide a more consistent user experience which increases the collaboration of the application with the operating system and increases usability by increasing familiarity. This will also decrease unnecessary distractions.

4.1.2 Layout and Navigation Requirements

From the first Login window to the last window, the user will encounter different functionalities. The system has got two different type of users. Each user type has got their own views. These different views create different layouts. Layouts are prepared with respect to generalization concept. Operations of use cases are grouped in windows and tabs to put these similar functionalities together.

Window navigation system is also essential. Any type of user shall have correct view navigations to get a better experience. Having different windows and opening them when needed with owner window relation will provide better navigation system.

4.1.3 Consistency

In every user interface design, user experience should be the main concern. So in our product design, windows and tabs are grouped and named with respect to their content. From the first window encountered to the end user will be able to navigate through what he/she wants by just looking at windows and tabs. Namings, tabs, and windows are non-contradictory. A good consistent design that we provide also decreases the confusion that graphical user interfaces create and time required to get used to the application.

Functionalities that are similar are grouped. This will provide a general look at the operation and its sub-operations. To accomplish a good generalization, the software uses tabbed panels, also known as tabs.

4.1.4 User Personalization & Customization Requirements

Mainly, the system interface will give two different views to users. Librarians and customers' view will differ in the functionalities. When customer logs into the system, "Main Customer Window" (Window 3 in Appendix B) will greet him/her. When librarian logs into the system, "Main Librarian Window" (Window 10 in Appendix B) will greet. As we can say, creating different views also changes displayed content.

4.2 Interfaces to External Systems or Devices

4.2.1 Software Interfaces

As an external system, we are going to use library database. Our first consideration about this database is building an interface to communicate with this database. Since our programming language is Java, to accomplish this we require Java Database Connectivity (JDBC) application programming interface. JDBC provides powerful tools to connect with the database with the object-oriented approach.

As another external system, there will be a payment application programming interface that is also related to the database system.

4.2.2 Hardware Interfaces

A hardware interface is not available since the desktop application has no designated hardware. But a real-life library book loan system should have devices to provide self-checkout and self-return functionalities inside libraries.

4.2.3 Communications Interfaces

A communications interface is not available.

5. Business Rules

5.1 Book Related Action Rules

5.1.1 Number of Books Currently Owned Rule

If the actor tries to borrow more than 5 books at once, the system will not allow the user to do that.

5.1.2 Self Checkout and Self Return System Rule

If the actor uses self checkout or self return systems, ISBN number should be used. ISBN is the libraries standard.

5.1.3 User's Booking Rule

If a user borrows a book, it should be returned in 30 days.

5.1.4 User's Waitlist Rule

If a user wants to take a book which is currently taken, then the system will notify the user and ask the user to add it to the waitlist. In the library system, it doesn't support adding an available book to waitlist so this system also doesn't support that.

5.2 Fine Rules

5.2.1 Exceeding Return Date Rule

If a user exceeds the return date of the book, then the system creates a fine to the user.

5.2.2 Fine Increment Rule

If user keeps book after return date and doesn't return the book, fine increases periodically. Every library system can have their own fine rate.

5.3 Manipulation Rules

5.3.1 Creating User

By the rules of library, if you need to create a user, the librarian should do it.

5.3.2 Updating User

If a user tries to update the user information, the e-mail address of the user cannot be changed instantly. The user needs to contact to authorized system actor.

5.3.3 Updating Book

If a user tries to update a book, ISBN of the book cannot be changed instantly. The user needs to contact to the system administrator.

6. System Constraints

The application can be used only as a desktop application. It is not used as a mobile phone application on mobile devices. Software's programming language is Java. There are not any constraints in the database.

Development will be made in Eclipse integrated development environment. Eclipse provides graphical user interface development tools. GUI will be prepared by this.

7. System Compliance

7.1 Licensing Requirements

This application will be used by libraries, so it will only be licensed to verified libraries. To be able to acquire Library Book Loan System Software, Group One Software should be contacted. The reason behind this is libraries who want to use this product needs to adjust their library systems.

7.2 Legal, Copyright, and Other Notices

Library Book Loan System (LBLS) provided by Group One Software. is for illustrative purposes only which provides customers with programming information regarding the products. This software is supplied "AS IS" without any warranties and support.

Group One Software assumes no responsibility or liability for the use of the software, conveys no license or title under any patent, copyright, or mask work right to the product.

Group One Software reserves the right to make changes in the software without notification. Group One Software also make no representation or warranty that such application will be suitable for the specified use without further testing or modification.

7.3 Applicable Standards

The LBLS software's default language is English. Also, the library system standards and book standards are global. This will provide an internationalization change to the system. By doing design and coding as general as possible will make it easier to do. Even though the system doesn't provide localization, it provides internationalization.

Java coding standards provided by Oracle will be used throughout the project development.

8. System Documentation

With product release, there will be a user manual to guide users. It will give overall look to the product, it is intended to give assistance to people. The user manual will have general help about the software system, the product usage. This user manual will be available online.

The document will be prepared by the whole Group One Software members.

9. Appendices

- SRS - Appendix A - Tabular Descriptions of Use Cases
- SRS - Appendix B - GUI Prototypes
- SRS - Appendix C - Data Model with ER Diagram