



HACETTEPE UNIVERSITY

COMPUTER SCIENCE AND ENGINEERING DEPARTMENT

BBM487 SOFTWARE ENGINEERING LAB
Group 14

LBS Desktop
System-Wide Requirements Specification

20926046
21327618
21228731

RIDVAN ALTUNEL
AYŞE AKCAN
MAHMUT TEKİNYER

Project Manager & Developer
Architect & Tester
Analyst & Technical Writer

| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

Library Book Loan System

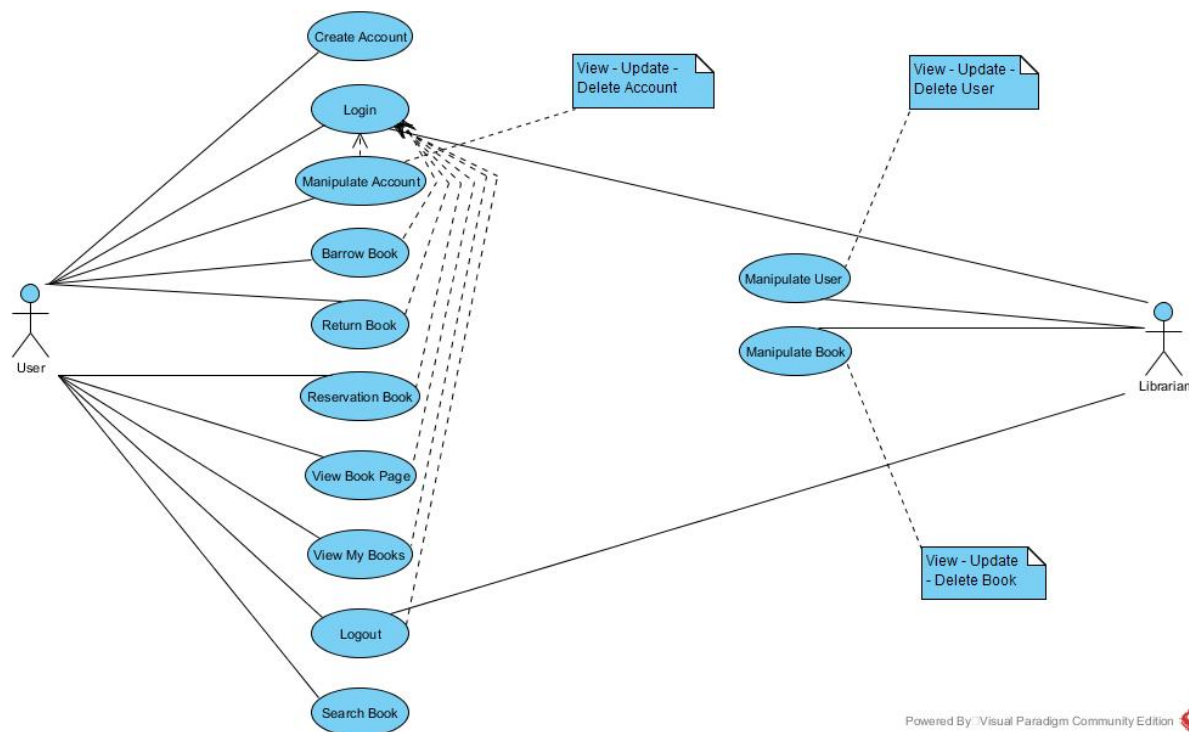
System-Wide Requirements Specification

1. Introduction

With this document, we will provide information about the properties of the project, its aims, system architecture, details and requirements. The project will also contain the project's conditions of use for the two main heroes that exist. This document describes the requirements and use of our project using the Use-Case Diagram, Activity Diagram, Context Diagram and GUI Prototype. It also describes the data model of the project with the E-R Diagram.

2. System-Wide Functional Requirements

We have identified the necessary use cases for the project. While determining these, we took the example of Hacettepe University library as an example to ourselves.

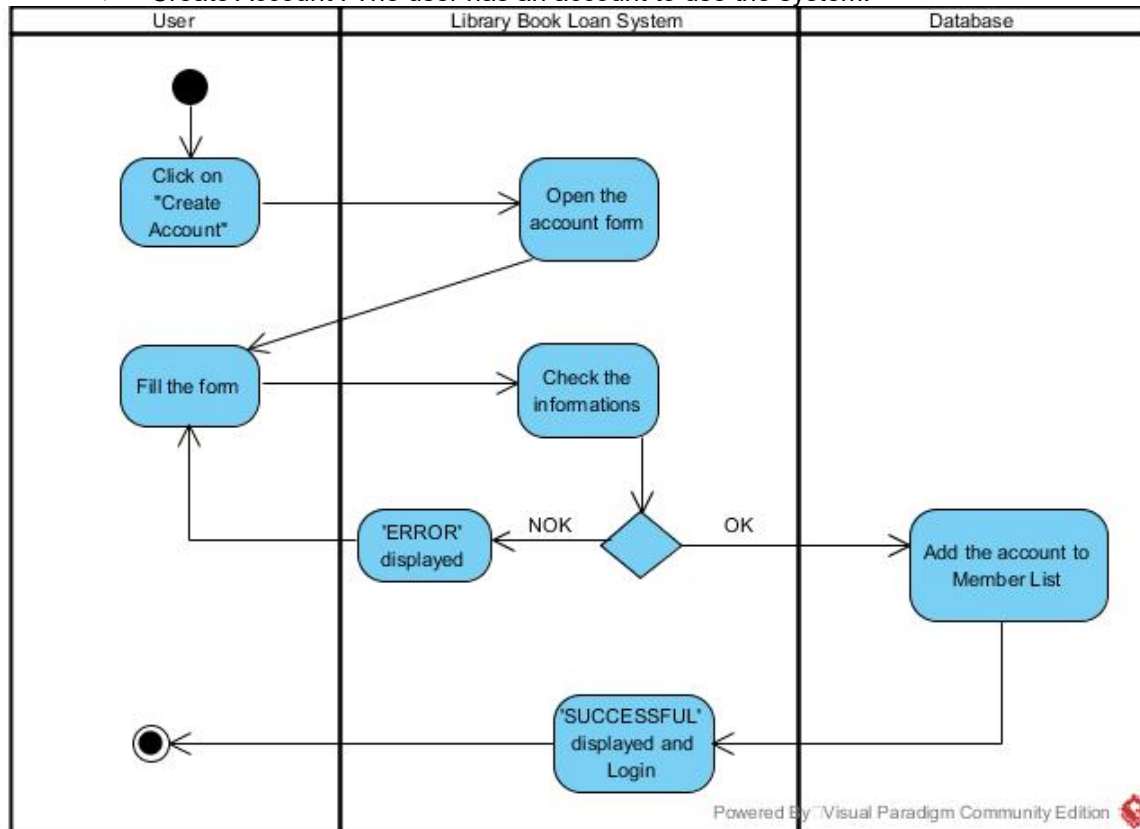


Powered By : Visual Paradigm Community Edition

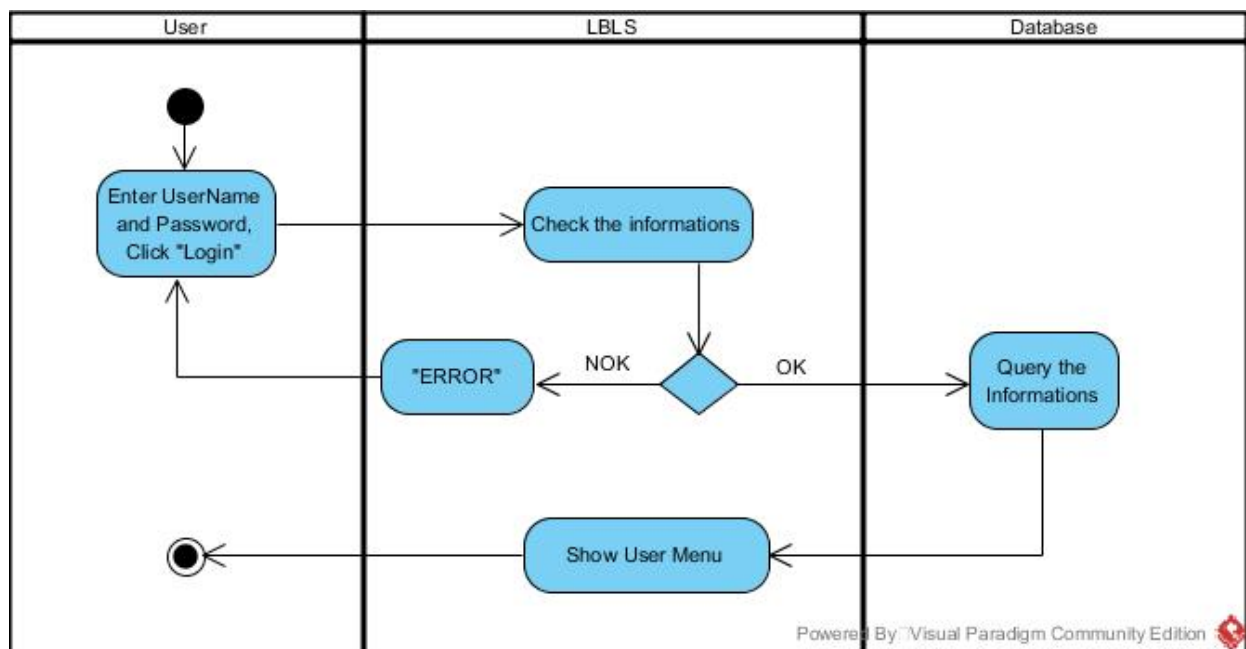
| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

Use cases for User:

- Create Account : The user has an account to use the system.



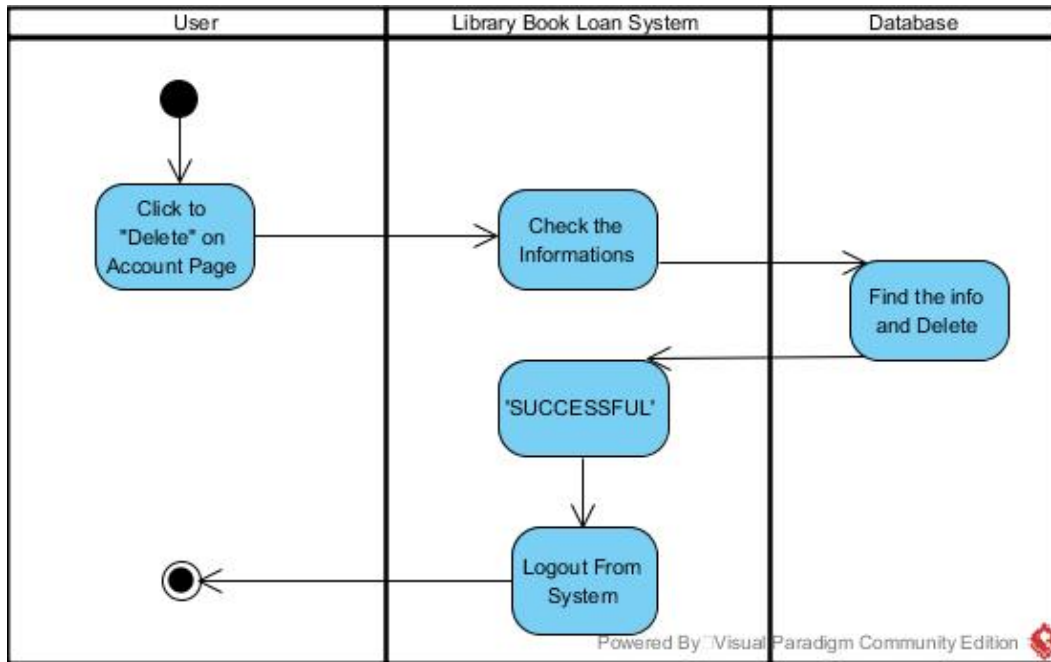
- Login : The member can enter the system using the account.



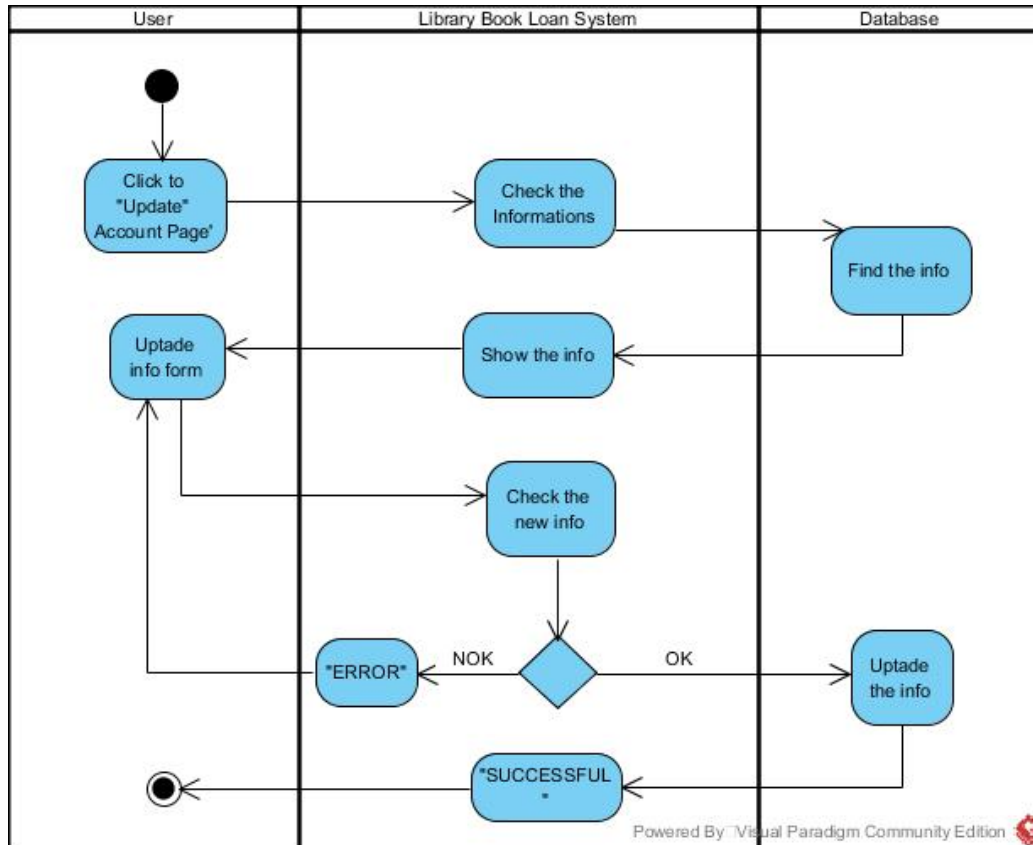
| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

- Manipulate Account : A member can make changes to his or her account (Delete - Update - View).

For Delete:

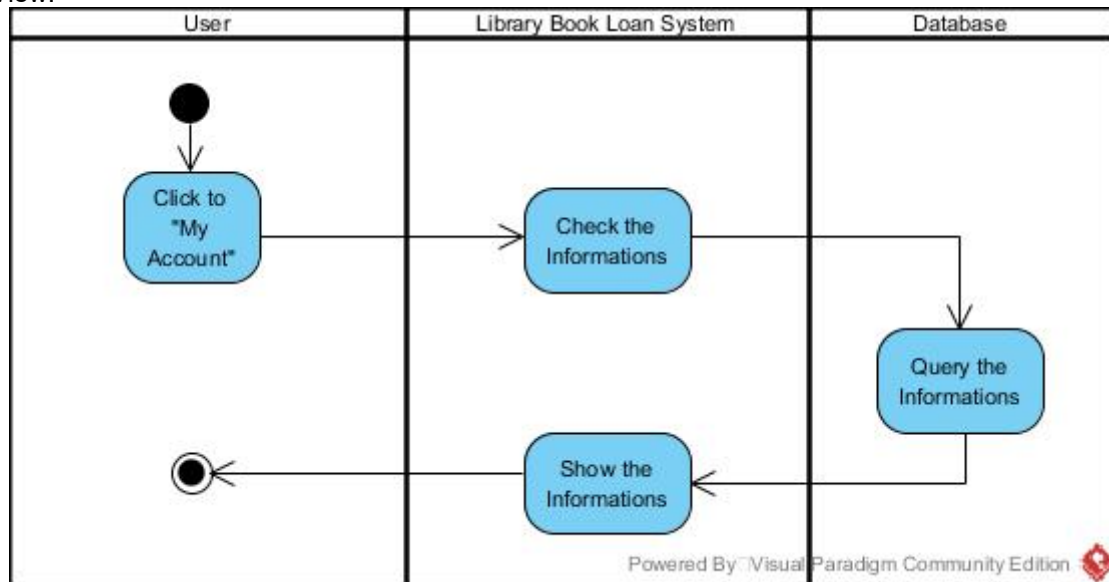


For Update:

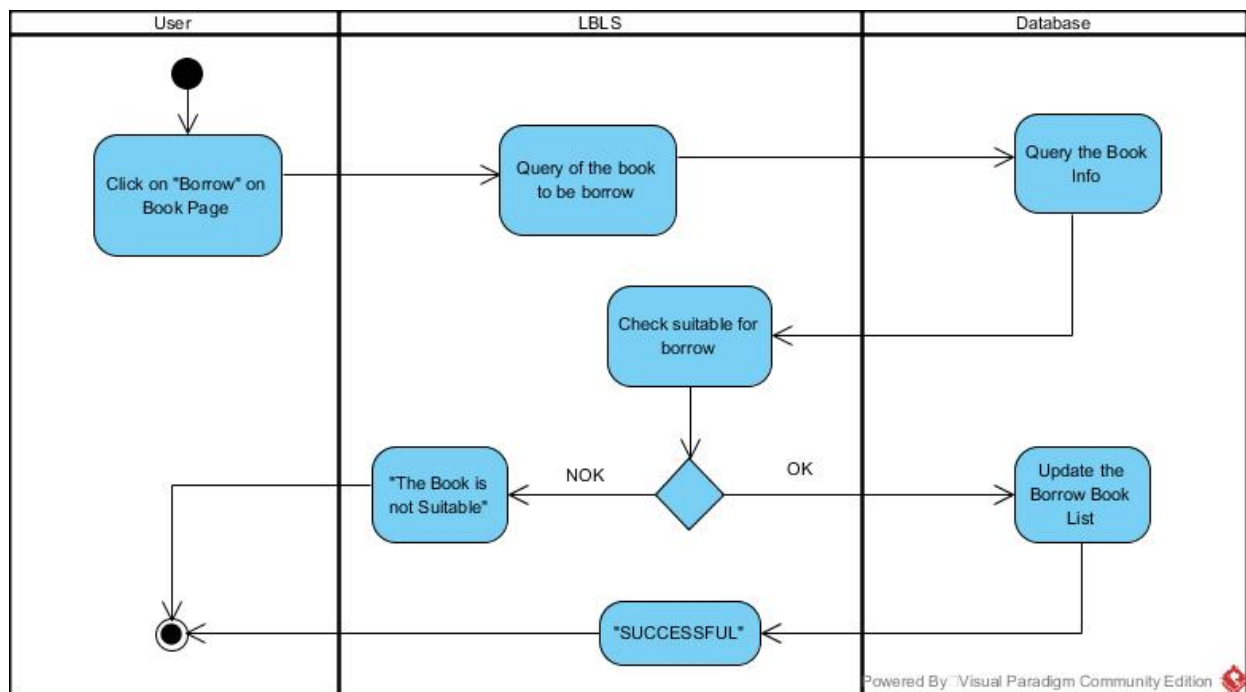


| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

For View:

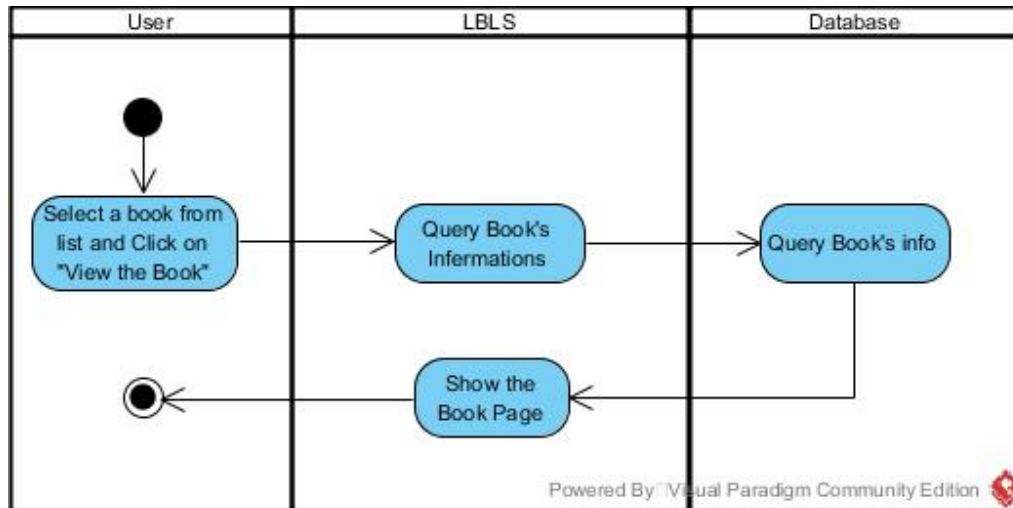


- Barrow Book : The member can borrow a book registered on the system.

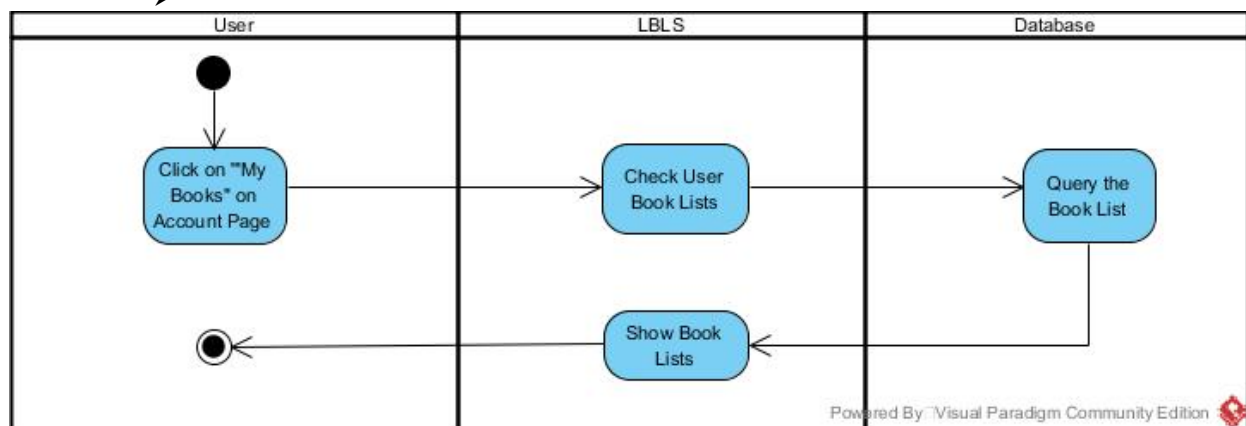


| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

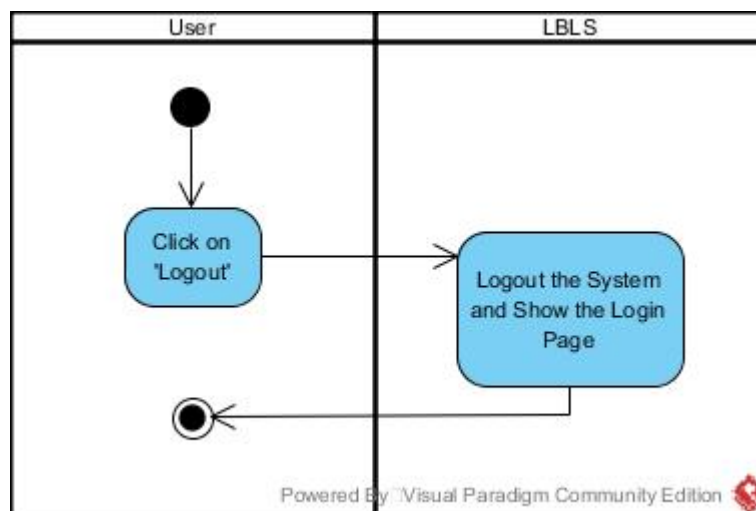
- View Book Page : The member can look into the details of the desired book.



- View My Books : Members can see the books they borrowed.

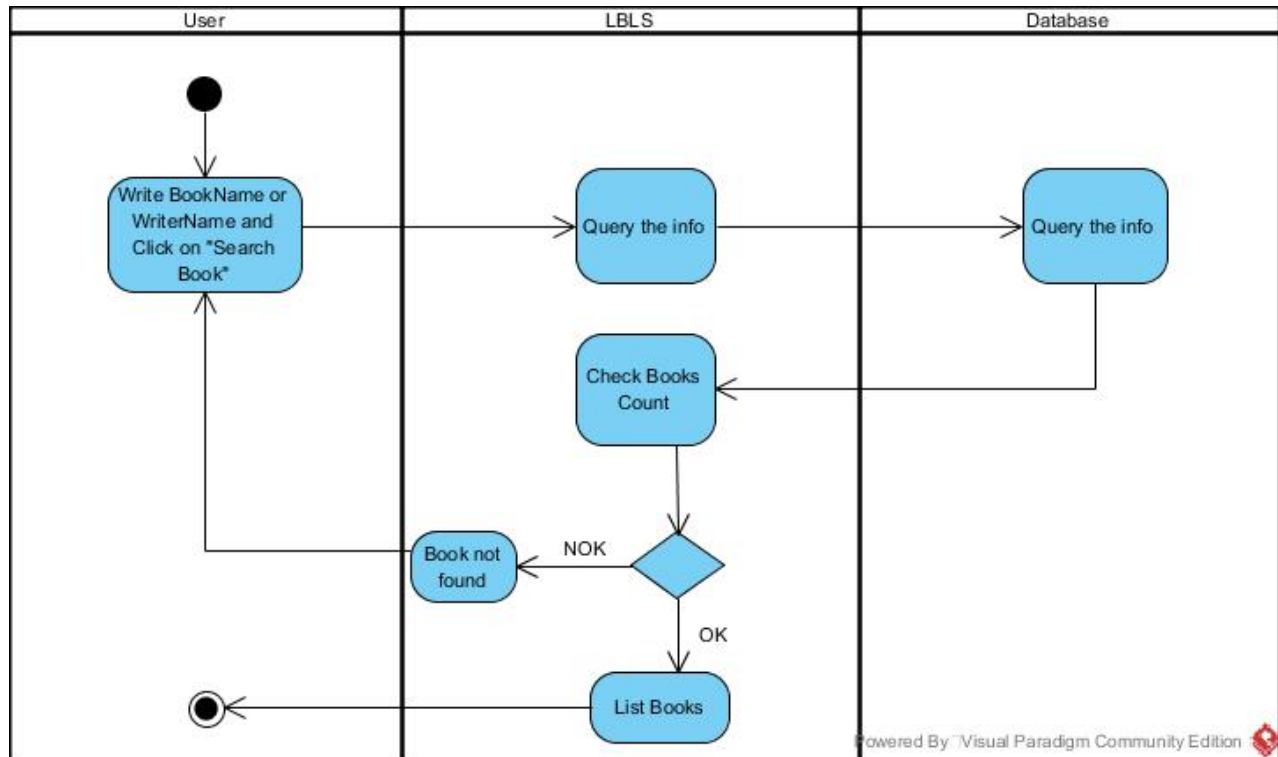


- Logout : The member must log out for account security.



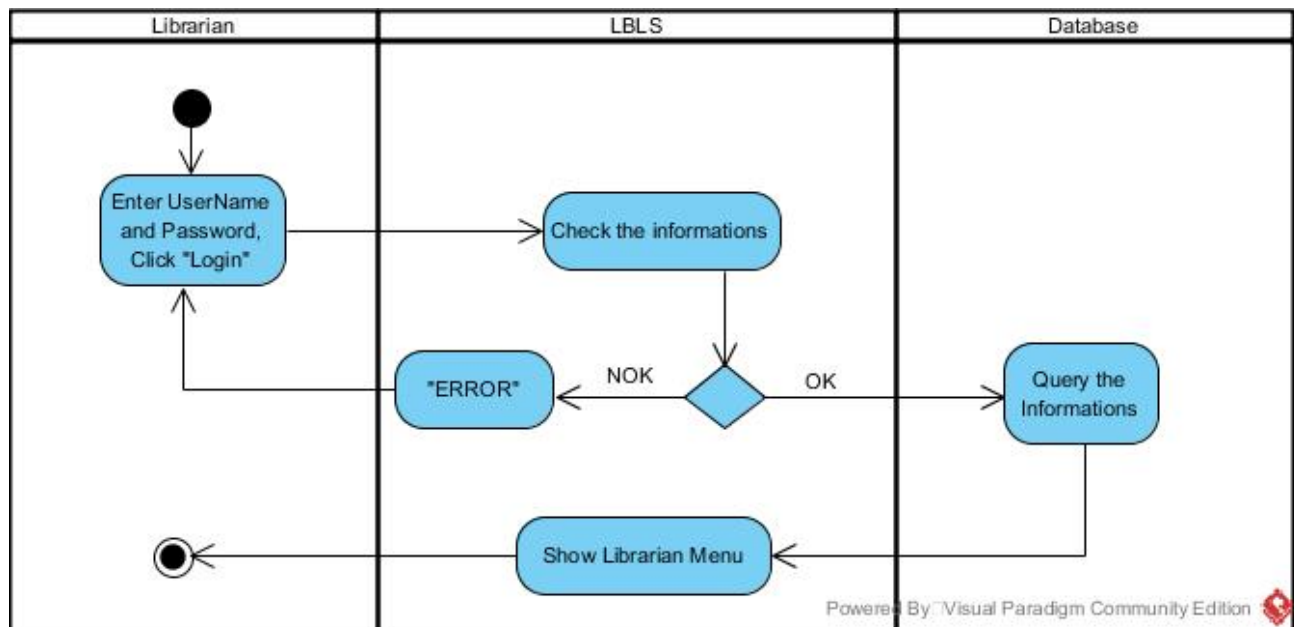
| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

- Search Book : Everyone can search the books on the system.



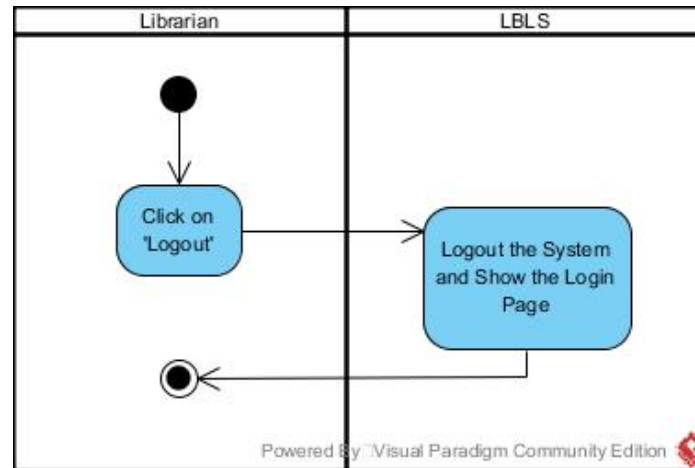
Use cases for Librarian:

- Login : The member can enter the system using the account.



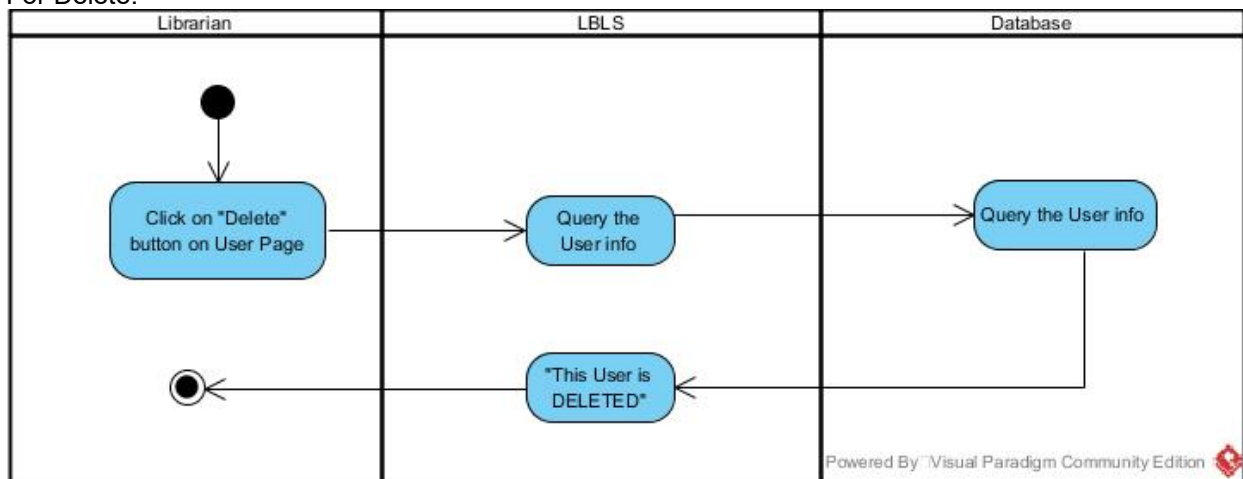
| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

- Logout : The member must log out for account security.

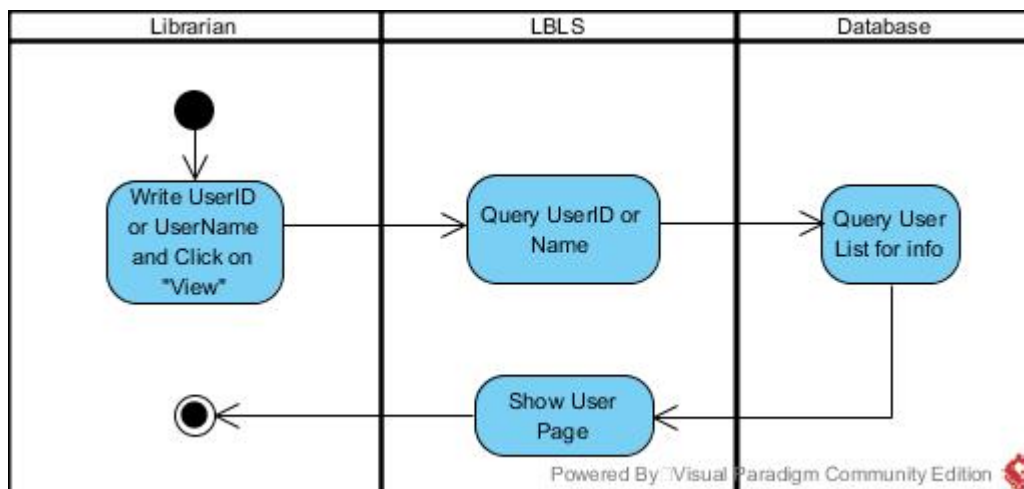


- Manipulate User : A staff can make changes to members' account (Delete - Update - View).

For Delete:

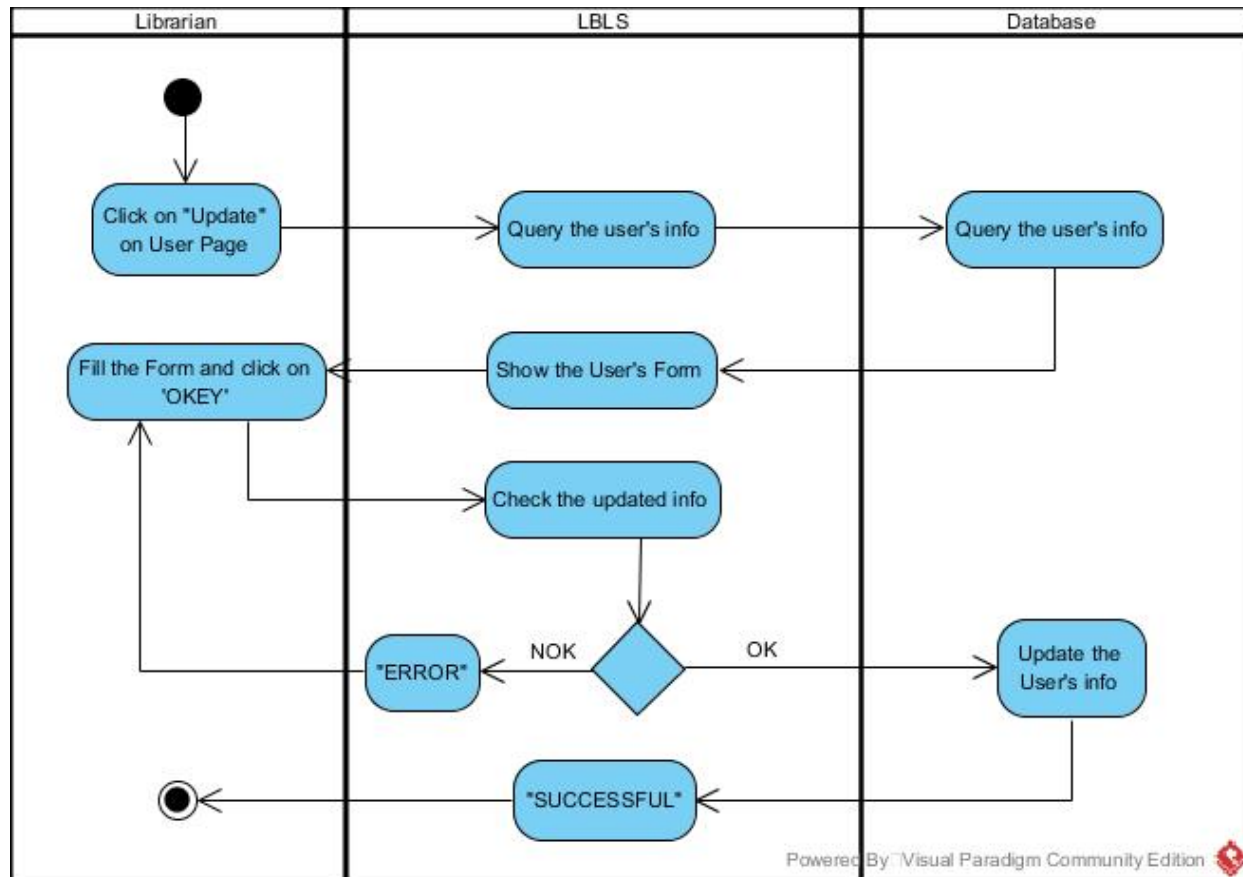


For View:



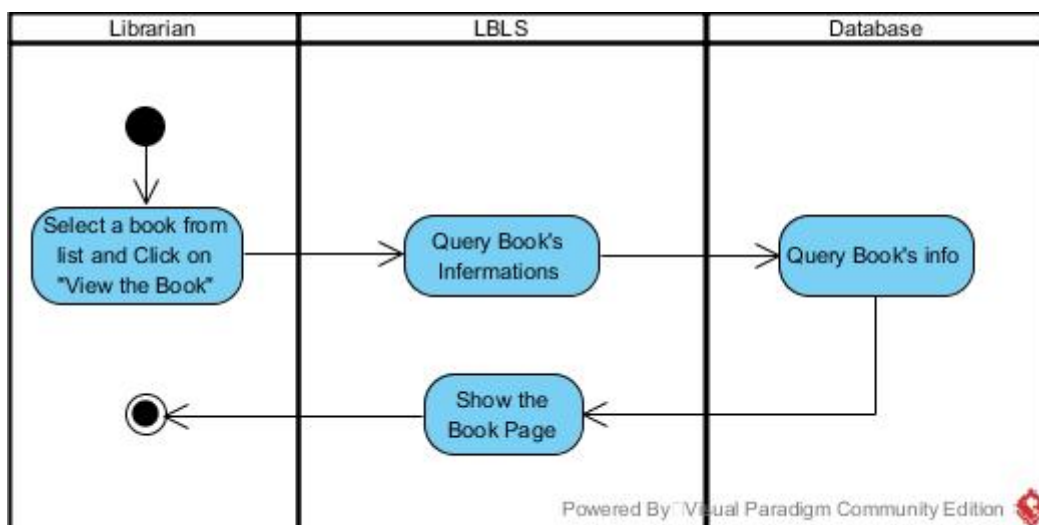
| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

For Update:



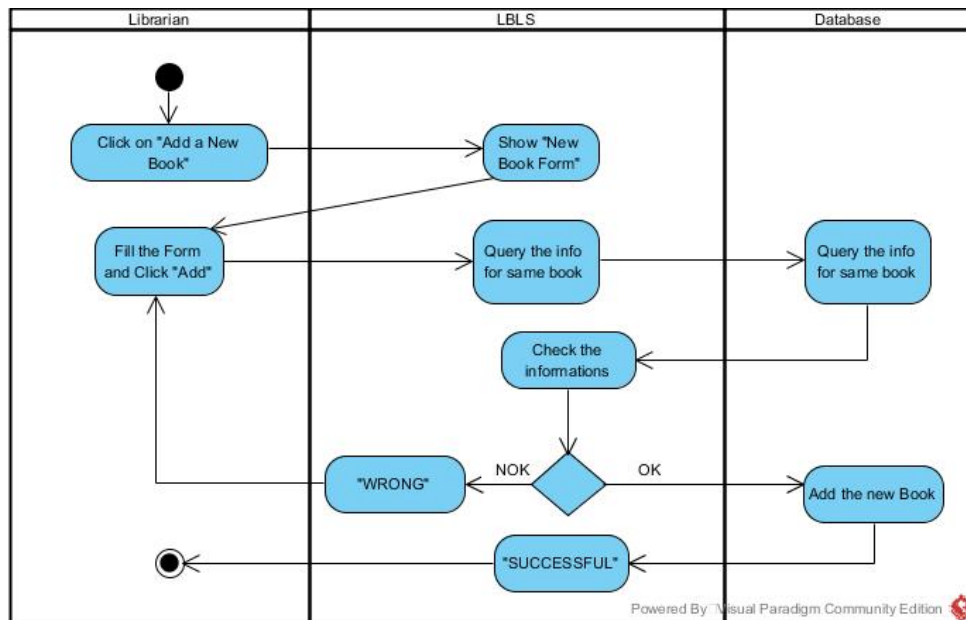
- Manipulate Book : A staff can make changes to books (Add - Delete - Update - View).

For View:

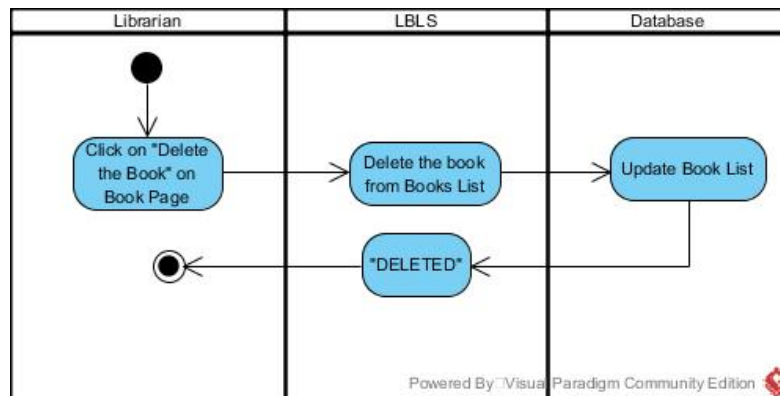


| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

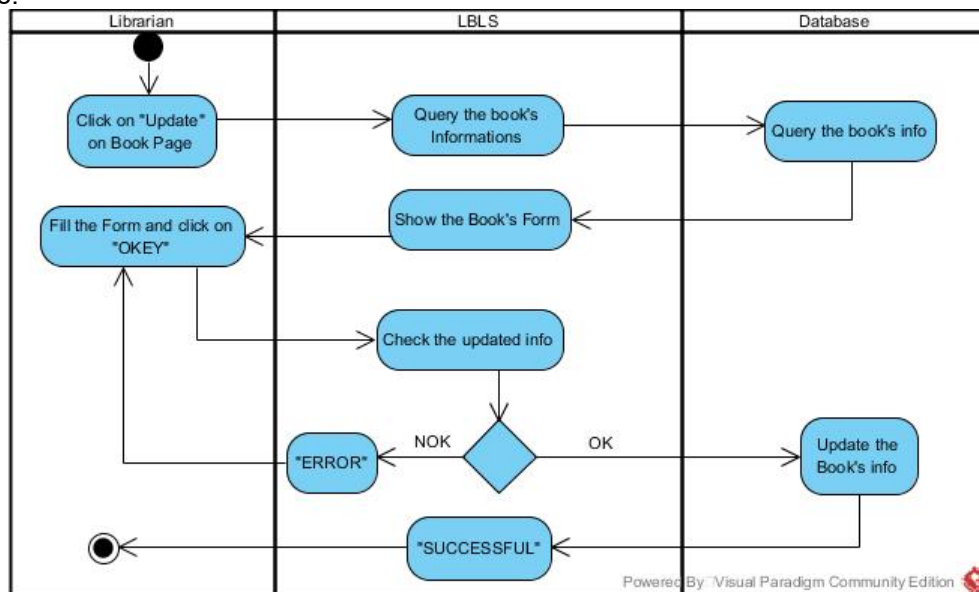
For Add:



For Delete:

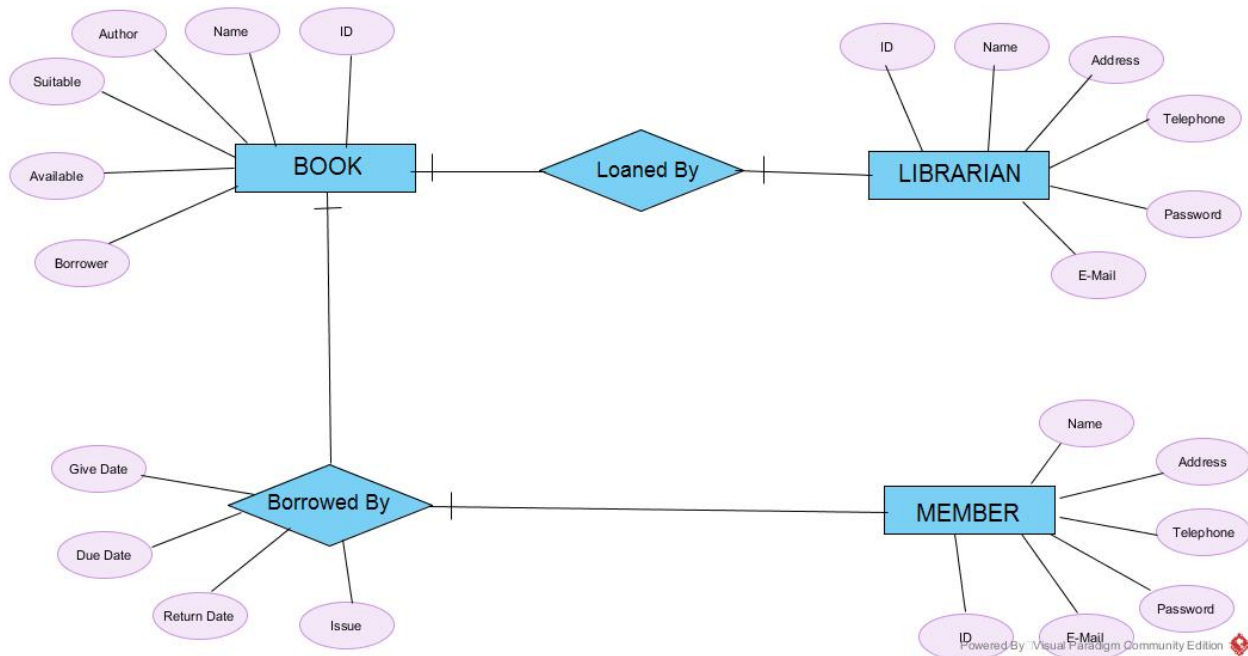


For Update:



| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

E-R Diagram :



3. System Qualities

3.1 Usability

The library system is designed as an easy-to-use system for anyone who uses it. The system is very easy to use. Users will be able to log in from the same page regardless of category. If you are a member, the member screen will be opened. When reserving a book, he or she will be able to choose according to the appropriate dates. In order to make the system more accessible, it is planned to be a web-based application.

3.2 Reliability

It is necessary to have a real e-mail address and a password appropriate for the conditions in order to open an account in the library system. The system uses a database to keep all this information. No one else will receive a book from a member. Also, when a book is returned, we are trying to solve the confusion that may occur on the waiting list.

3.3 Performance

The project will be developed on the web. It will be about the speed of the internet server entered into the project. The response time on the project will also be as low as possible. But since all the data will be pulled from the database, we will reduce the delay times with the correct search algorithms.

3.4 Supportability

The project will not include complexity in the application so that the project can be strengthened by other applications in order to increase the marketing area of the project. Any desired feature can be added at this time.

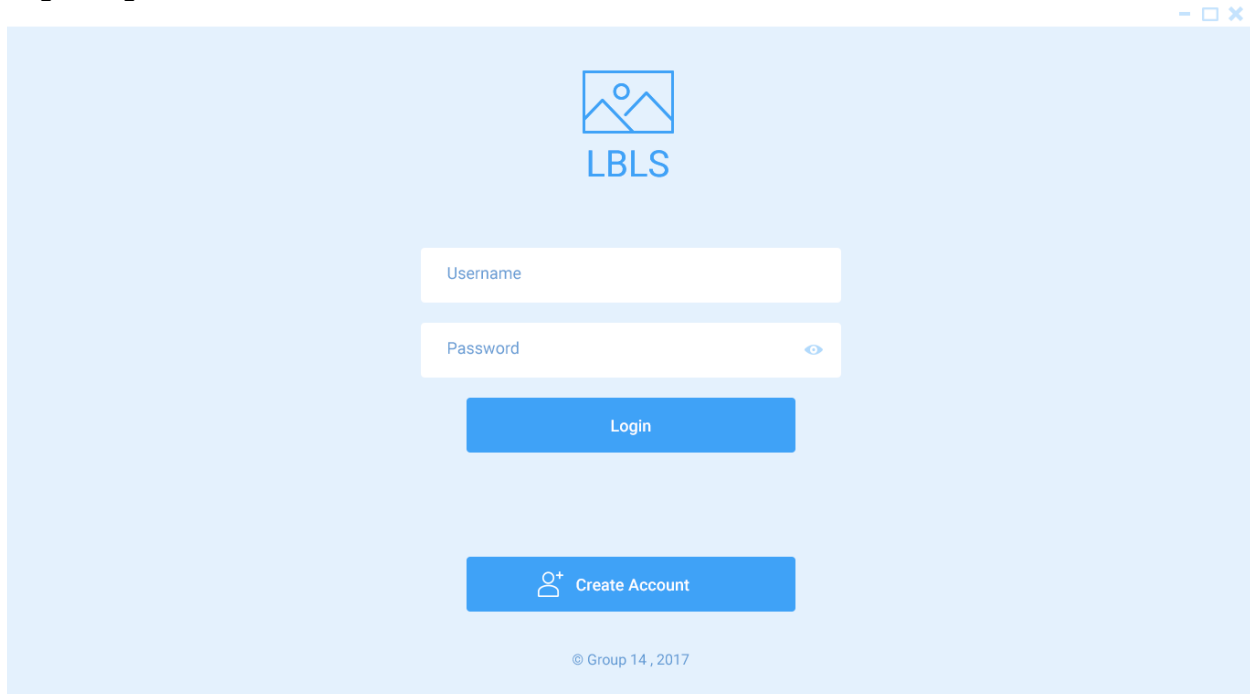
| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

4. System Interfaces

4.1 User Interfaces

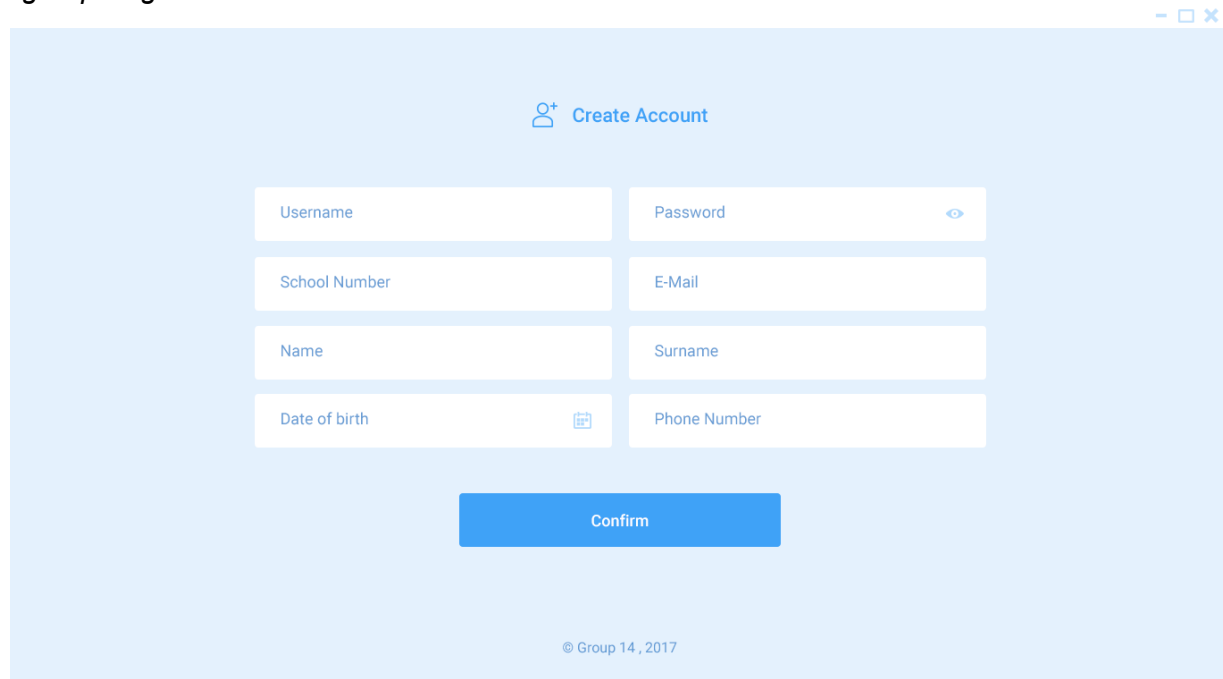
User interface is one of the most important component of our project. We have purposed a clean, stylish and handy user interface. Some of our UI Wireframes that contains our layout principles (not color or gui components, only informs about layout, alignments etc.) are placed below;

Login Page



The Login Page wireframe features a light blue background. At the top center is the LBLS logo, which consists of a square icon containing a stylized mountain and sun, with the text 'LBLS' below it. Below the logo are two white input fields: 'Username' and 'Password'. The 'Password' field has a small eye icon to its right. Below these fields is a blue 'Login' button. Further down is a blue button with a user icon and the text 'Create Account'. At the bottom center, there is a small copyright notice: '© Group 14 , 2017'. In the top right corner of the wireframe, there are three small icons: a minus sign, a square, and an 'x'.

Sign-up Page



The Sign-up Page wireframe has a light blue background. At the top center is a blue button with a user icon and the text 'Create Account'. Below this are eight white input fields arranged in four rows and two columns. The first row contains 'Username' and 'Password' (with an eye icon). The second row contains 'School Number' and 'E-Mail'. The third row contains 'Name' and 'Surname'. The fourth row contains 'Date of birth' (with a calendar icon) and 'Phone Number'. Below these fields is a blue 'Confirm' button. At the bottom center, there is a small copyright notice: '© Group 14 , 2017'. In the top right corner of the wireframe, there are three small icons: a minus sign, a square, and an 'x'.

| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

Logged in user homepage

Your Name
School Number

LOGOUT

LBLS

Search Books

Action-1

Action-1

Action-1

Action-1

Action-1

Action-1

© Group 14, 2017

Book Page when the book is available to borrow

Your Name
School Number

LOGOUT

Book Information

Book name

Book info - 2

Book info - 1

Book info - 3

Book info - 4 (wide)

✓ Book is available

Loan Book

© Group 14, 2017

| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

Book Page when it is not available to borrow

Book Information

Book name

Book info - 2

Book info - 1

Book info - 3

Book info - 4 (wide)

Book is not available

Loan Book

Add me on waiting list

© Group 14 , 2017

User's book list that they borrowed

My Books

Search Books

| Book Name | Dates | Fine |
|-----------|------------|------|
| Book - 1 | 13.03.2017 | 12tl |
| Book - 2 | 13.03.2017 | - |
| Book - 3 | 13.03.2017 | 3tl |
| Book - 4 | 13.03.2017 | - |
| Book - 5 | 13.03.2017 | - |

Take me to Books Page

© Group 14 , 2017

4.1.1 Look & Feel

User Interface will be generated according to the wireframe set that created before our development process. The UI/UX designer (will be developer in our project) decides a color

| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

palette that includes 3-4 major color (and it's auxiliary tones). Also a font family will be selected by same person for typography part of design. Colors and fonts are the most characteristic part of user interface. Also an icon-set that will be used in our user interfaces will be created just before development process.

4.1.2 Layout and Navigation Requirements

Layout and navigation are the unseen but the critical contributors of user interface. They provides the feeling of firmness, and standartization of software. The static graphical content such as icons, background images etc. will be created in Photoshop CC according to the color palette and size constraints. All of interface organization and layout will be implemented on development section. GridBagLayout provides appropriate solution for every need, therefore it has been selected for layout section of user interface design.

4.1.3 Consistency

Consistency is a mandatory concept for a quality user interface design. It has to be clarified just before the coding section of software development. Every same purposed user interface component has to be have same visual properties (color, size etc..). Also navigation and layout desicions must be serve in the same way. User interface that generated with consistent rules can be managed and edited easier.

4.1.4 User Personalization & Customization Requirements

There will be not any personalization & customization feature in this software. All type of users can only make modifications with data (according to their authorization). All of user-interface decisions and implementation will be handled and controlled by project team. This limitation is critical for consistency in our opinion.

4.2 Interfaces to External Systems or Device

Our software works in cooperation with database management system. So we can define DBMS as an external system. The software can be apply any kind of operation on database if the user has needed authorization. Also we may need a payment API for fine system if we decide to give place it in our software.

4.2.1 Software Interfaces

- MySQL Workbench will be used to manage database operations.
- Adobe Photoshop CC will be used to designing graphical content that will not be created with JavaSwing (icons, image backgrounds etc.)
- Java is the main programming language on this project, Java Swing (GridBagLayout) will be used to develop user interface.
- Eclipse IDE will be used for developing process.
- MySQL will be used as database in this project. We will connect our software to the database via JDBC API.
- GitHub will be used as main tool for working as team and versioning.

4.2.2 Hardware Interfaces

This softwares only requires a connection to the database. So we can assume a server for hardware requirement only.

4.2.3 Communications Interfaces

We may need a mailing API for sending fine notifications and give notice to user when his/her waiting book is available. This kind of features will be added our software according to other major requirements' achivement status.

| | |
|--|------------------|
| Library Book Loan System | |
| System-Wide Requirements Specification | Date: 21/03/2017 |

5. Business Rules

5.1 Creating a New Account

- Username must be unique.
- A user has to have a valid school number (student or academic) to create a user account.
- Every school number can be connected to maximum one user account.

5.2 Loaning Book

- User has to pay his/her fines if there exists before the loaning operation.
- A user can loan three books at the same time.
- Each book can be loaned for 30 days maximum.

5.3 Latency Fining

- For each day that past the giveback date, user will be fined by 3tl by Library Management.

5.4 Deleting Account

- Any non-dept user can be deleted from the system.

6. System Constraints

This desktop application will be run on any operation system (that used for desktop computers) because of developing in Java. As we mentioned it will be developed using Java. Our database service will be MySQL. Database connection will be made by JDBC API. The computer that will execute this software has to have an internet connection to run it properly.

7. System Compliance

7.1 Licensing Requirements

Our software and documentation will be freely available in public.

7.2 Legal, Copyright, and Other Notices

Non-commercial redistribution or modification is allowed.

7.3 Applicable Standards

Our software will have IEEE standards about to software architecture. We will follow these standards on design steps so we will have more effective process.

8. System Documentation

Our project team will prepare a guide documentation to use this software properly. It will include;

- Creating a new member account
- Manipulating members for librarian
- Manipulating books for librarian
- Login activity
- Add name to book waiting list
- Taking a book