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| **CSC380: Software Engineering - Final** |
| **Library System Application** |
| This document summarizes the customer requirement statement, system requirements with priorities, and user stories for the system requirements with size estimates for the library system application. Team members: Joshua Reiss Alex Lawrence |

**2/15/2018**

# Breakdown of Contributions

All team members contributed equally to this report and the code submitted for the library system application.

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# Glossary of Terms

|  |  |
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| **Term** | **Definition** |
| Account | Storage for the user information for the system. |
| Administrator | A user which has privileges to customize, alter and update all facets of the library system. |
| Check in/out | Borrow and return book from the library. |
| Contact us | Contact information for the developers of the library system application. |
| Event | Information on activities held at library or in the community. |
| Login | Main screen of the library system to sign in to the system. |
| Password | Password set by user used to login to the system. |
| Profile | Information for users, account information, fee due. |
| Registration | User information entered to establish new account. |
| Requirement | Established needs of customer for the system development. |
| User Id | Unique value to identify users of the system. |
| User Story | A description of a software feature from an end-user perspective. |
| View Book | Search library for available books. |
| Work Log | Library staff daily assignments and status. |

# Customer Requirement Statement

Libraries have gone through a period where usage was profoundly lowered for several reasons. One of the main reasons is the lack of the ability to access library information from home or office. This issue applies to the average user as well as researchers. To perform research on a topic, it typically takes multiple trips to the library which results in a waste of time for both the researcher and the librarians. Often when going to the library reader or researcher finds out the item is not available, needs to be obtained from another library, or is available in electronic form. Many patrons of libraries have started using other means to obtain reading material. To combat the risk of libraries closing, they started offering additional services. Most libraries have started offering free WI-FI, technology workshops, small business centers and 24/7 virtual access to e-Books, digital materials, career and job resources, and high school certification courses. These services have helped returned library usage to its previous levels. To increase library usage and prevent any future decreases there is a need for a library system application. The library system application should be a program that can be installed on any computer. To develop the system both a GUI and system section are necessary. To properly create the library system application requirements, design, code, and testing is required for both sections. The library system application must offer functionality for clients, employees, employers, and administrators of the library. This application should allow a patron to perform library related activities from their desired location and only required infrequent trips to the library at scheduled times. The activities should include:

1. Login capability for library staff and patrons
   1. Allows secure login
   2. Allows user to register online
   3. Provide ability to reset password
   4. Provide ability to retrieve forgotten user id
2. Check in/out capability
   1. check in/out option
   2. Allows user to take out books and return them
3. View Books capability
   1. Search academic publications such as journals, books or articles
   2. Search by tile, year, ISBN
4. Profile capability
   1. Displays user registration information
   2. Delete user account
5. Event display capability
   1. Displays library events
   2. Displays community events
6. Work Log capability
   1. Staff daily assignments
   2. Staff assignment status
7. Admin capability
   1. Provides the ability to add/delete books in the system
   2. Provides the ability to set overdue book fees
   3. Search and delete user accounts
8. Contact Us information capability
   1. Contact email address
   2. Contact phone number
   3. Contact Company name
9. Update application
10. Refresh current Library system application data

# Library System Requirements

This following list of requirements has been derived from the consumer's requirement statement for the library system. Each requirement contains "shall" to indicated it is required functionality to implement the system. Each requirement has an identifier in the form of LS-x, as well as a priority weight from 1 to 5. A higher priority weight indicates the corresponding requirement is more essential to the success of the project, and more critical to fulfilling the customer’s needs.

*\*All employees have user capabilities as well as their own\**

*\*All employers have user and employee capabilities as well as their own\**

## Functional Requirements

| **Req ID** | **PW** | **Requirement Text** |
| --- | --- | --- |
| Login Requirements | | |
|  | 5 | The system login screen shall provide a registration option for new users. |
|  | 5 | The system shall store the user information in the account database. |
|  | 3 | The system shall validate the user login information and return a status. |
|  | 5 | The system shall display the main library system interface after user information validation returns success. |
| 1. T | 1 | The system login screen shall display an error message after user information validation returns failure. |
|  | 2 | The system login screen shall provide a reset password option for all existing accounts. |
|  | 3 | The system login screen shall provide a forgot user id option for all existing accounts to retrieve their user id. |
|  | 1 | The system login screen shall provide an exit option to close the library system. |
|  | 1 | The system login screen shall provide a cancel option to clear out the user id and password entries. |
| Forgot User ID Requirements | | |
|  | 4 | The system shall accept a users email and verify the input. |
|  | 4 | The system forgot user screen shall display the user id for the provided email. |
|  | 3 | The system forgot user screen shall provide the option to return to the login screen. |
|  | 2 | The system forgot user screen shall display an error message after user information validation returns failure. |
| Reset Password Requirements | | |
|  | 4 | The system reset password screen shall accept a user id. |
|  | 4 | The system reset password screen shall accept a new password. |
|  | 3 | The system reset password screen shall provide a submit and return to login option. |
|  | 3 | The account database shall be searched for a link to the user id. |
|  | 4 | If the user id and library number are linked to an account then the inputted password shall be changed. |
|  | 2 | The system reset password screen shall display an error message after user information validation returns failure. |
| Registration Requirements | | |
|  | 3 | The system registration screen shall accept the user's first name. |
|  | 2 | The system registration screen shall accept the user's last name. |
|  | 2 | The system registration screen shall accept the user's address. |
|  | 2 | The system registration screen shall accept the user's city. |
|  | 2 | The system registration screen shall accept the user's state. |
|  | 2 | The system registration screen shall accept the user's zip code. |
|  | 3 | The system registration screen shall accept the user's email address. |
|  | 2 | The system registration screen shall accept the user's phone number. |
|  | 4 | The system registration screen shall accept the user's username. |
|  | 4 | The system registration screen shall accept the user's password. |
|  | 5 | The system registration screen shall require confirmation of the new password entered. |
|  | 4 | The system registration screen shall provide a submit and return to login option. |
|  | 2 | The system registration screen shall provide a cancel and return to login option. |
|  | 5 | The submit and return to login option creates an account with the accepted user information and returns to the login screen. |
|  | 2 | The system reset password screen shall display an error message after user information validation returns failure. |
| Main Interface Requirements | | |
|  | 3 | The system main interface screen shall provide a profile option. |
|  | 3 | The system main interface screen shall provide a view books option. |
|  | 4 | The system main interface shall provide a work log option viewable by employees and employers. |
|  | 4 | The system main interface shall provide an admin page option viewable by administrators. |
|  | 3 | The system main interface shall provide an event log option. |
|  | 3 | The system main interface shall provide a contact us option. |
|  | 5 | The system main interface shall be visible to all users. |
|  | 4 | The system main interface shall provide an option to log out. |
| Profile Requirements | | |
|  | 4 | The system the profile screen shall display the user registration information. |
|  | 2 | The system the profile screen shall display a user’s status. |
|  | 3 | The system the profile screen shall display a user’s Library Number. |
|  | 3 | The system the profile screen shall provide a delete account option. |
|  | 5 | The system the profile screen shall be visible to all users. |
| View Books Requirements | | |
|  | 4 | The system view books screen shall display all books in the Library. |
|  | 5 | The system view books screen shall display the books availability. |
|  | 3 | The system view books screen shall display the book's Title. |
|  | 3 | The system view books screen shall display the book's Author. |
|  | 3 | The system view books screen shall display the book's Year. |
|  | 3 | The system view books screen shall display the book's ISBN. |
|  | 3 | The system view books screen shall display the book's Condition. |
|  | 3 | The system view books screen shall display the book's Genre. |
|  | 4 | The system view books screen shall provide a search bar. |
|  | 5 | The system view books screen shall be visible to all users. |
|  | 4 | The system will provide an add book option visible only to employers. |
|  | 4 | The system will provide a delete book option visible only to employers. |
|  | 4 | The system will provide a check in option visible only to employers. |
|  | 4 | The system will provide a check out option visible only to employers. |
| Check in/out Requirements | | |
|  | 3 | The system check in/out screen shall accept a user's library number. |
|  | 5 | The system check in/out screen shall allow an employee to select a book. |
|  | 5 | The system check in/out screen shall accept a check in or out action. |
|  | 4 | The system shall calculate any overdue fee necessary and add to the user account. |
| Work Log Requirements | | |
|  | 5 | The system work log screen shall display staff daily assignments. |
|  | 3 | The system work log screen shall accept and display staff daily assignment status. |
|  | 3 | The system shall allow employees to delete completed work logs. |
|  | 4 | The system shall sort the work log by priority and then chronological order. |
| Admin Page Requirements | | |
|  | 3 | The system admin page screen shall provide a search accounts option. |
|  | 3 | The system admin page screen shall provide a set constants option. |
|  | 5 | The system admin page screen shall only be visible to employers. |
| Admin Search Page Requirements | | |
|  | 4 | The system admin search screen shall provide a search bar by library number. |
|  | 3 | The system admin search screen shall display the list of all library users. |
|  | 3 | The system admin search screen shall display the users information if searched by library number. |
|  | 4 | The system admin search screen shall allow the employer to delete the account. |
|  | 4 | The system admin search screen shall allow the employer to change the status of the account. |
|  | 5 | The system admin search screen shall only be visible to employers. |
| **Add/Delete Page Requirements** | | |
|  | 5 | The system add/delete screen shall provide an add book option. |
|  | 4 | The system add/delete screen shall provide a delete book option. |
|  | 3 | The system add/delete screen shall accept an input of a book's title. |
|  | 3 | The system add/delete screen shall accept an input of a book's year. |
|  | 4 | The system add/delete screen shall accept an input of a book's ISBN. |
|  | 2 | The system admin add/delete screen shall accept an input of a book's genre. |
|  | 1 | The system admin add/delete screen shall accept an input of a book's condition. |
|  | 3 | The system events screen shall only be visible to employees. |
| Admin Set Fee and Check out Limits Requirements | | |
|  | 4 | The system Admin Fee screen shall allow employers to input a damage fee. |
|  | 4 | The system Admin Fee screen shall allow employers to input a late fee. |
|  | 3 | The system Admin Fee screen shall allow employers to input the time a book may be kept. |
|  | 3 | The system Admin Fee screen shall allow employers to input a checkout size. |
|  | 5 | The system Admin Fee screen shall only be visible to employers. |
| Events Requirements | | |
|  | 3 | The system events screen shall display upcoming events sorted by date. |
|  | 4 | The system events screen shall display the events date, time, title, host name, location, and description. |
|  | 5 | The system events screen shall have an add option only visible to employees. |
|  | 5 | The system events screen shall be visible to all users. |
|  | 4 | The systems events screen add option shall allow employees to add a new event. |
| Contact Us Requirements | | |
|  | 2 | The system contact us screen shall display the creators email. |
|  | 2 | The system contact us screen shall display the creators phone number. |
|  | 2 | The system contact us screen shall display the creators company name. |
|  | 4 | The system contact us screen shall be visible to all users. |
|  | 2 | The system shall print any additional information entered by the admin for this screen. |

## Non-Functional Requirement

| **REQ ID** | **PW** | **Requirement Text** |
| --- | --- | --- |
|  | 5 | The interface of the system should be friendly to user. |
|  | 5 | Each user must have a separate login. |
|  | 3 | The system code shall have a maximum code complexity of ten. |
|  | 2 | The system code shall have maximum of 120 characters per line. |
|  | 3 | The system code shall be written with indentation to convey program structure and increase the readability of the code. |
|  | 3 | The system code shall contain variable declarations that demonstrate the function of the variable which they store. |
|  | 4 | High level design shall be completed for the system. |
|  | 5 | Users shall be not allowed to access the accounts of other users. |
|  | 4 | System shall be divided into several independent sections, to allow ease of modifications. |
|  | 3 | System shall provide the user with informative status messages. |
|  | 2 | The System's internal code shall link with the visual code efficiently, and effectively. |
|  | 5 | The system shall be backed up to avoid data lose. |

## On-Screen Requirement

| **REQ ID** | **PW** | **Requirement Text** |
| --- | --- | --- |
|  | 1 | The system shall provide an exit button to allow the user to exit the application. |
|  | 2 | The system shall allow user to logout at any time during the session. |
|  | 3 | The system should allow user to navigate to home page of the app whenever needed. |
|  | 4 | The system shall display library system application data. |
|  | 5 | The system shall display real time data availability. |

# User Stories System Requirements

This following list of user stories has been derived from the consumer's requirement statement for the library system. Each user story describes the actor's role as implemented in the system. Each user story has an identifier in the form of US-x, as well as a point value from 1 to 5. A higher point value indicates the corresponding user story is more essential to the success of the project, and more critical to fulfilling the customer’s needs.

\*All employees have user capabilities as well as their own\*

\*All employers have user and employee capabilities as well as their own\*

| **User Story ID** | **User Story Text** | **Points** |
| --- | --- | --- |
| Login User Story | | |
|  | As a user, I can view the login screen. | 5 |
|  | As a user, I can enter my account information. | 4 |
|  | As a user, I can click on a register button if I do not have an account. | 4 |
|  | As a user, I can login in with the information I typed in. | 5 |
|  | As a user, I can clear out the information I typed in. | 2 |
|  | As a user, I can click on the reset password button if I do not remember my password. | 4 |
|  | As a user, I can click on the forgot user Id button if I do not remember my Id. | 3 |
|  | As a user I can exit the Application screen. | 2 |
| Forgot User ID User Story | | |
|  | As a user, I can view the Forgotten User Id screen. | 5 |
|  | As a user, I can enter my email and retrieve my user Id. | 4 |
|  | As a user, I can return to the Login. | 5 |
| Reset Password User Story | | |
|  | As a user, I can view the Reset Password screen. | 5 |
|  | As a user, I can enter my User Id, a new password and re-enter that new password. | 4 |
|  | As a user I can submit my entered information and return to the login screen. | 5 |
| Registration User Story | | |
|  | As a user, I can view the Registration screen. | 5 |
|  | As a user, I can enter all my information with a unique User Id and email. | 5 |
|  | As a user I can submit my information and return to the login screen. | 4 |
| Main Interface User Story | | |
|  | As a user, I can view the Library System screen. | 5 |
|  | As a user, I can click on the profile button, view books button, events button, contact us button and log out. | 4 |
|  | As an employee, I can click on the work log button. | 4 |
|  | As an employer, I can click on the admin page button. | 4 |
| Profile User Story | | |
|  | As a user, I can view my account information and delete my account. | 3 |
|  | As a user, I can return to the Library System. | 5 |
| View Books User Story | | |
|  | As a user, I can view the view books screen. | 5 |
|  | As a user, I can view all the books in the Library. | 5 |
|  | As a user, I can view a books: availability, title, author, year, ISBN, condition, and genre. | 4 |
|  | As an employer, I can add a book to the library. | 3 |
|  | As an employer, I can delete a book to the library. | 2 |
|  | As an employer, I can check in a book to the library. | 3 |
|  | As an employer, I can check out a book to the library. | 3 |
| Check in/out User Story | | |
|  | As an employee, I can view the Check in/out screen. | 5 |
|  | As an employee I can enter a user’s Library Number. | 3 |
|  | As an employee, I can select if a book if being taken out or put back in. | 3 |
|  | As an employee, I can select if there is any damage to the returning book. | 2 |
| Work Log User Story | | |
|  | As an employee, I can view the work log screen. | 5 |
|  | As an employee, I can view all the work that that needs to be done. | 5 |
|  | As an employee, I can input who started the work. | 3 |
|  | As an employee, I can input when the work was done. | 3 |
|  | As an employee, view all completed work. | 2 |
| Admin Page User Story | | |
|  | As an employer, I can view the admin page screen. | 5 |
|  | As an employer, I can select the set constants button, or the search page button. | 4 |
| Admin Search Page User Story | | |
|  | As an employer, I can view the Admin search screen. | 5 |
|  | As an employer, I can use a search bar for user’s library numbers. | 4 |
|  | As an employer, I can view the users profile information if searched by library number. | 4 |
|  | As an employer, I can delete the account. | 1 |
|  | As an employer, I can change the status of the account. | 2 |
| **Add/Delete Page User Story** | | |
|  | As an employee, I can view the add/delete screen. | 5 |
|  | As an employee, I can add/delete a book. | 3 |
|  | As an employee, I can input a book's Title. | 3 |
|  | As an employee, I can input a book's Author. | 3 |
|  | As an employee, I can input a book's Year. | 3 |
|  | As an employee, I can input a book's ISBN Number. | 4 |
|  | As an employee, I can input a book's genre. | 2 |
|  | As an employee, I can input a book's condition. | 1 |
| Admin Set Fee and Check out Limits User Story | | |
|  | As an employer, I can view the Admin set fee and Checkout Limits screen. | 5 |
|  | As an employer, I can input a damage fee. | 3 |
|  | As an employer, I can to input a late fee. | 3 |
|  | As an employer, I can input the time a book may be kept. | 2 |
|  | As an employer, I can input a checkout size. | 3 |
| Events User Story | | |
|  | As a user, I can view the events screen. | 5 |
|  | As a user, I can view all upcoming events with its date, time, title, host name, location, and description. | 4 |
|  | As an employee, I can view the add option. | 5 |
|  | As an employee, the add option will allow me to add a new event. | 4 |
| Contact Us User Story | | |
|  | As a user, I can view the contact us screen | 2 |
|  | As a user, I can view the creators email, phone number, and company name. | 1 |

# Use Cases

## Preface

Users will be granted access to the functionality of the site as soon as they have created an account. They will have the ability to retrieve their user id if forgotten, reset current password, and login to the system. Once logged in the user will have access to the library systems main interface. The main interface provides the capability to view user profiles, view all the libraries books, view all current events, utilize the contact us option, and log out. Each section in the library system has extensive list of functionalities. Each section in the Library System will be described with an individual use case.

## High Level Use Case Descriptions

**UC-1 - Login Use Case**

Login allows a registered user to access the system. This case should give the user the option to login using their account credentials. After selecting the login option the system verifies the information in the database. Upon successful query the system displays the Main Interface page. Upon a failure to query the system displays an error message username and/or password did not match account database.

**UC-2 - Forgot User Id Use Case**

Forgot User Id allows a registered user to retrieve their user id. This use case should give the user the option to retrieve their user id. After selecting the option, the user is prompted for their email address. The system verifies the database with the email address for the corresponding user id. Upon a successful query the system displays the user id. Upon a failure query, the system displays an error message no corresponding user id was found.

**UC-3 - Reset Password Use Case**

Reset Password allows a registered user to reset their password. This use case should give the user the option to reset their password. After selecting the option, the user is prompted for their User Id, Library Number, a new password and re-enter that new password. After selecting the submit option the system verifies information entered in the database. Upon successful query the system confirms the new password for the user. Upon failure query, the system displays and error message incorrect user id and/or Library number associated with given email address or mismatched password.

**UC-4 - Registration Use Case**

Registration allows an unregistered user to create an account. This use case should give the user the option to create an account. After selecting the option, the user is prompted for all their information. After selecting the submit option the system verifies the information entered in the database. Upon a successful query the system creates an account for the user. Upon a failure query, the system displays and error message invalid information entered or username is already taken.

**UC-5 - Main Interface Use Case**

Main Interface allows signed in user to utilize the systems functionality. This use case should give the user the option to access their profile, current events, the contact us page, and also log out; If an employee is using the system they will also be able to see the work log page, and if employer is using the system an additional page for admin's will become available to choose. After selecting their preferred option, the user will be taken to the new screen. Upon successful query, the system confirms the new page selection and takes the user the chosen screen. Upon failure query, the system does not take the user to their preferred choice.

**UC-6 - Profile Use Case**

Profile allows a signed in user to view personal information. This use case should give the user the option to delete their account or return to the main interface. After selecting the option, the user is prompted for confirmation to delete . After selecting the submit option the system verifies selection. Upon successful query, the system deletes the users account. Upon failure query, the system does not delete the users account.

**UC-7 - View Books Use Case**

View books allows a signed in user to view current books. This use case should give the user the option to browse all the books and refine their search. After refining their search, the system verifies information entered in the database. Upon successful query, the system shows all the current books with the users preferred selection. Upon failure query, the system does not refine the books or incorrectly does.

**UC-8 - Check In/Out Books Use Case**

Check In/Out Books allows a signed in employee to check books in or out with their status. This use case should give the employee the option to sign a book out or take one back from a user. After selecting the option, the user is prompted for the users library number, and if the book is being returned or taken out. After selecting the submit option the system verifies information entered in the database. Upon successful query the system confirms the book has been taken out or put back in. Upon failure query, the system displays and error message invalid library number.

**UC-9 - Work Log Use Case**

Work Log allows a signed in employee to view the work completed for the day. This use case should give the employee the option to input their work done throughout the day. After selecting the submit option, what work was completed. After selecting the submit option the system verifies information entered in the database. Upon successful query the system confirms the added work. Upon failure query, the system displays and error message incorrect user id.

**UC-10 - Admin Page Use Case**

Admin Page allows a signed in employer to choose their desired page. This use case should give the employer the option to view the search, and set fees page. After selecting their preferred option, the user will be taken to the new screen. Upon successful query, the system confirms the new page selection and takes the employer the chosen screen. Upon failure query, the system does not take the employer to their preferred choice.

**UC-11 - Admin Search Page Use Case**

Admin Search Page allows a signed in employer to look up any user. This use case should give the employer the option to search for a user by library number. After selecting the option, the employer is prompted to enter a library number. After selecting the submit option the system verifies information entered in the database. Upon successful query, the system displays the user for the employer. Upon failure query, the system displays and error message incorrect Library number entered.

**UC-12 - Add/Delete Page Use Case**

Add/Delete Page allows a signed in employee to add or delete any book. This use case should give the employee the option to choose to add or delete a book. After selecting the option, the employee is prompted to enter the book's title, year, ISBN, author, genre, condition, and availability. After selecting the submit option the system verifies information entered in the database. Upon successful query, the system adds or deletes the book from the library system. Upon failure query, the system displays and error message invalid ISBN entered.

**UC-13 - Admin Set Fee and Check out Limits Use Case**

Admin Set Fee and Check out Limits allows a signed in employer to set constant fees. This use case should give the employer the option to set a fee for late books, damage fees, checkout size and how long a book can be kept for. After selecting the option, the employer is prompted to enter a what fees are wanted to change. After selecting the submit option the system verifies information entered in the database. Upon successful query, the system updates all new fees added. Upon failure query, the system does not update any fees added or incorrectly updates them.

**UC-14 - User Events Use Case**

User Events allows a signed in user to view current events. After selecting the option the system verifies the users selection. Upon successful query the system confirms the users selection and displays all current events. Upon failure query, the system displays and error message, unable to view events.

**UC-15 - Employee Events Use Case**

Employee Eventsallows a signed in employee to view current events. This use case should give the employee the option to add events. After selecting the option, the employee is prompted to select a what information about a event to add. After selecting the submit option the system verifies information entered in the database. Upon successful query the system confirms the updates to the event page and displays them for the user's to see. Upon failure query, the system does not update an event or add one correctly.

**UC-16 - Contact Us Use Case**

Contact Us allows a signed in user to view the contact us page. This use case should display the creators information. After selecting the page, the system verifies the selection with the database. Upon successful query the system displays the page and all the creators information for the user. Upon failure query, the system does not display the page or not all of the creators information.

## Detailed Use Case Descriptions

Having an account within the database is necessary for the user to access the functionality within the system. The user can select the register option from the login screen to create an account. From the registration screen the user enters the necessary information to create an account. Some of the information requires user confirmation, e.g. password. The system will confirm the information meets the validation requirements and then creates the user’s account. Once the user account is created, the login screen is displayed. After the user logs in they will have access to the library systems main interface. The user will into the system until the exit option is selected.

|  |  |  |
| --- | --- | --- |
| **UC-1 - Login Use Case** | | |
| Related Requirements: | | LS-3, LS-4, LS-5, LS-8, LS-9 |
| Related User Stories: | | US-1, US-2, US-4, US-5,US-7 |
| Initiating Actor: | | User |
| Actor’s Goal: | | Login |
| Participating Actors: | | User, Database |
| Pre-conditions: | | User must be registered and know their username and password |
| Post conditions: | | The Database displays the Main Interface |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. User enters login credentials | |
| **→** | 2. User selects login option | |
| **←** | 3. System verifies the user’s information against the database | |
| **←** | 4. System confirms user id information | |
| **←** | 5. System displays Main Interface | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. User enters login credentials | |
| **→** | 2. User selects login option | |
| **←** | 3. System verifies the user's information against the database | |
| **←** | 4. System displays error, invalid username and/or password | |

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| **UC-2 - Forgot User Id Use Case** | | |
| Related Requirements: | | LS-7, LS-10, LS-11, LS-12 |
| Related User Stories: | | US-7, US-8, US-9 |
| Initiating Actor: | | User |
| Actor’s Goal: | | Retrieve User Id |
| Participating Actors: | | User, Database |
| Pre-conditions: | | User must be registered and know the email address used for registration |
| Post conditions: | | The Database retrieves and displays the user id |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. User clicks the forgot user id option | |
| **→** | 2. User enters email address for user id retrieval | |
| **←** | 3. System checks database for user's email address | |
| **←** | 4 System retrieves and displays user id info | |
| **←** | 5. System allows user to return to login screen | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. User clicks the forgot user id option | |
| **→** | 2. User enters email address for user id retrieval | |
| **←** | 3. System checks database for user's email address | |
| **←** | 4. System displays error no user id associated with email address entered | |

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| **UC-3 - Reset Password Use Case** | | |
| Related Requirements: | | LS-6, LS-13, LS-14, LS-15, LS-16, LS-17, LS-18, LS-19 |
| Related User Stories: | | US-6, US-11, US-12, US-13 |
| Initiating Actor: | | User |
| Actor’s Goal: | | Reset Password |
| Participating Actors: | | User, Database |
| Pre-conditions: | | User must select the reset password option |
| Post conditions: | | The Database displays the reset password screen |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. User clicks the reset password option | |
| **→** | 2. User enters User Id, a new password and re-enter that new password | |
| **→** | 3. User selects the submit option | |
| **←** | 4. System checks database for user's entered information | |
| **←** | 5. System confirms user’s new password | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. User clicks the reset password option | |
| **→** | 2. User enters User Id, a new password and re-enter that new password | |
| **→** | 3. User selects the submit option | |
| **←** | 4. System checks database for user's entered information | |
| **←** | 5. System displays error no user number associated with given email address or mismatched password | |

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| **UC-4 - Registration Use Case** | | |
| Related Requirements: | | LS-1, LS-2, LS-20, LS-21, LS-22, LS-23, LS-24, LS-25, LS-26, LS-27, LS-28, LS-29, LS-30, LS-31, LS-32, LS-33 |
| Related User Stories: | | US-3,US-14, US-15, US-16 |
| Initiating Actor: | | User |
| Actor’s Goal: | | Sign up a user |
| Participating Actors: | | User, Database |
| Pre-conditions: | | User must select the registration option |
| Post conditions: | | The Database displays the registration screen |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. User clicks the registration option | |
| **→** | 2. User enters all user information | |
| **→** | 3. User selects confirm option | |
| **←** | 4. System stores users entered information | |
| **←** | 5. System confirms information and creates an account for the user | |
| **←** | 6. System displays the login screen | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. User clicks the registration option | |
| **→** | 2. User enters all his information | |
| **←** | 3. User selects confirm option | |
| **←** | 4. System attempts to store users entered information | |
| **←** | 5. System displays error invalid registration information entered or username is already taken | |

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| **UC-5 - Main Interface Use Case** | | |
| Related Requirements: | | LS-40, LS-41 |
| Related User Stories: | | US-17, US-18, US-19, US-20 |
| Initiating Actor: | | User |
| Actor’s Goal: | | Utilize system functionality |
| Participating Actors: | | User, Database |
| Pre-conditions: | | User must be signed in |
| Post conditions: | | The Database displays the users preferred screen |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. User logged in | |
| **←** | 2. System verifies the user’s information against the database | |
| **→** | 3. User allowed to select any library system capability | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. User logged in | |
| **←** | 2. System verifies the user’s information against the database | |
| **←** | 3. System displays an error, library system unviable at this time | |

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| **UC-6 - Profile Use Case** | | |
| Related Requirements: | | LS-33, LS-42, LS-43, LS-44, LS-45, LS-46, LS-47, LS-48 |
| Related User Stories: | | US-21 |
| Initiating Actor: | | User |
| Actor’s Goal: | | View user's information or delete account |
| Participating Actors: | | User, Database |
| Pre-conditions: | | User must be signed in |
| Post conditions: | | The Database displays user's profile and provides the option to delete the account |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. User clicks the profile option | |
| **←** | 2. System retrieves user's information from the database | |
| **←** | 3. System displays the user’s information and a delete option | |
| **→** | 4. User clicks delete profile option | |
| **←** | 5. System deletes users account | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. User click profile option | |
| **←** | 2. System retrieves user's information from the database | |
| **←** | 3. System fails to display displays the user’s information and a delete option | |

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| **UC-7 - View Books Use Case** | | |
| Related Requirements: | | LS-34, LS-49, LS-50, LS-51, LS-52, LS-53, LS-54, LS-55, LS-56, LS-57, LS-58, LS-59, LS-60 |
| Related User Stories: | | US-22, US-23, US-24 |
| Initiating Actor: | | User |
| Actor’s Goal: | | View Library's Book's |
| Participating Actors: | | User, Database |
| Pre-conditions: | | User must be signed in |
| Post conditions: | | The Database displays the View books and allows to refine the users search |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. User clicks the view books option | |
| **←** | 2. System displays all the current books | |
| **→** | 3. User can refine search | |
| **←** | 4. System displays user's refined search | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. User clicks the view books option | |
| **→** | 2. System displays all the current books | |
| **←** | 3. User can refine search | |
| **←** | 4. System displays error, no books found | |

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| **UC-8 - Check In/Out Use Case** | | |
| Related Requirements: | | LS-36, LS-61, LS-62, LS-63, LS-64, LS-65, LS-66 |
| Related User Stories: | | US-25, US-26, US-27, US-28 |
| Initiating Actor: | | Employee |
| Actor’s Goal: | | Check book in or out of the library |
| Participating Actors: | | User, Database |
| Pre-conditions: | | Employee must be signed in |
| Post conditions: | | The Database displays the Check in/out and allows input of a books condition |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. Employee clicks the check in/out option | |
| **→** | 2. Employee checks a book in/out | |
| **→** | 3. Employee inputs user library number | |
| **←** | 4. System verifies the employees entered book choice | |
| **←** | 5. System updates library system with book addition | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. Employee clicks the check in/out option | |
| **→** | 2. Employee checks a book in/out | |
| **←** | 3. System verifies the employees entered book choice | |
| **←** | 4. System displays error, invalid selection | |

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| **UC-9 - Work Log Use Case** | | |
| Related Requirements: | | LS-36, LS-67, LS-68, LS-69, LS-70, LS-71 |
| Related User Stories: | | US-29, US-30, US-31, US-32, US-33 |
| Initiating Actor: | | Employee |
| Actor’s Goal: | | Input work for the day |
| Participating Actors: | | Employee, Database |
| Pre-conditions: | | Employee must be signed in |
| Post conditions: | | The Database displays the Work and allows for edits to be made |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. Employee clicks the work log option | |
| **→** | 2. Employee enters works done | |
| **←** | 3. System verifies the employees entered information | |
| **←** | 4. System updates and displays work log | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. Employee clicks the work log option | |
| **→** | 2. Employee enters works done | |
| **←** | 3. System verifies the employees entered information | |
| **←** | 4. System displays error, invalid work added | |

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| **UC-10 - Admin Page Use Case** | | |
| Related Requirements: | | LS-37, LS-75 |
| Related User Stories: | | US-34, US-35, US-36 |
| Initiating Actor: | | Employer |
| Actor’s Goal: | | Go to the Admin Page |
| Participating Actors: | | Employer, Database |
| Pre-conditions: | | Employer must be signed in |
| Post conditions: | | The Database displays the Admin Page |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. Employer clicks the admin page option | |
| **→** | 2. System verifies the Employer’s information against the database | |
| **←** | 3. System displays the Admin screen | |
| **→** | 4. Employer allowed to select any admin capability | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. Employer clicks the admin page option | |
| **←** | 2. System verifies the Employer’s information against the database | |
| **←** | 3. System displays error, invalid user type must be an employer to access this option. | |

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| **UC-11 - Admin Search Page Use Case** | | |
| Related Requirements: | | LS-72, LS-76, LS-77, LS-78, LS-79, LS-80, LS-81, LS-82 |
| Related User Stories: | | US-36, US-37, 38, US-39, US-40, US-41, US-42 |
| Initiating Actor: | | Employer |
| Actor’s Goal: | | Look up a user |
| Participating Actors: | | Employer, Database |
| Pre-conditions: | | Employer must be signed in |
| Post conditions: | | The Database displays the user searched for |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. Employer selects the Search option | |
| **←** | 2. System verifies the employer’s information against the database | |
| **←** | 3. System displays the Search screen | |
| **←** | 4. System allows employer to search for user account information, change user status or delete and account | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. Employee selects the Search option | |
| **←** | 2. System verifies the user’s information against the database | |
| **←** | 3. System displays error, invalid user type must be an employee to access this option. | |

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| **UC-12 - Add/Delete Page Use Case** | | |
| Related Requirements: | | LS-73, LS-83, LS-84, LS-85, LS-86, LS-87, LS-88, LS-89, LS-90, LS-91 |
| Related User Stories: | | US-43, US-44, US-45, US-46, US-47, US-48, US-49 |
| Initiating Actor: | | Employee |
| Actor’s Goal: | | Add or delete a book |
| Participating Actors: | | Employee, Database |
| Pre-conditions: | | Employee must be signed in |
| Post conditions: | | The Database allows the employer to add or delete books |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. Employee selects the Add/Delete option | |
| **←** | 2. System verifies the employee’s information against the database | |
| **←** | 3. System displays the Add/Delete screen | |
| **←** | 4. System allows employee to add or delete a book | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. Employee selects the Add/Delete option | |
| **←** | 2 System verifies the user’s information against the database | |
| **←** | 3. System displays error, invalid user type must be an employee to access this option. | |

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| **UC-13 - Admin Set Fee and Check out Limits Use Case** | | |
| Related Requirements: | | LS-74, LS-92, LS-93, LS-94, LS-95, LS-96, LS-97 |
| Related User Stories: | | US-50, US-51, US-52, US-53, US-54, US-55 |
| Initiating Actor: | | Employer |
| Actor’s Goal: | | Set fees |
| Participating Actors: | | Employer, Database |
| Pre-conditions: | | Employer must signed in |
| Post conditions: | | The Database allows the employer to input fees |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. Employee selects set fee or check out limits option | |
| **←** | 2. System verifies the employer's information against the database | |
| **←** | 3. System displays the set fee or check out limit screen | |
| **←** | 4. System allows employer to set late and damage fee, set limit and time on check out for a user | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. Employee selects set fee or check out limits option | |
| **←** | 2. System verifies the employer's information against the database | |
| **←** | 3. System displays error, invalid user type must be an employee to access this option | |

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| **UC-14 - User Events Use Case** | | |
| Related Requirements: | | LS-38, LS-98, LS-99, LS-101 |
| Related User Stories: | | US-56, US-57 |
| Initiating Actor: | | User |
| Actor’s Goal: | | View current events |
| Participating Actors: | | User, Database |
| Pre-conditions: | | User must be signed in |
| Post conditions: | | The Database displays the Events |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. User selects events option | |
| **←** | 2. System verifies which events screen to display based on user type | |
| **←** | 3. System displays user event screen | |
| **←** | 4. System allows user to view events | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. User selects events option | |
| **→** | 2. System verifies which events screen to display based on user type | |
| **←** | 3.  System displays error, unable to retrieve event information | |

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| **UC-15 - Employee Events Use Case** | | |
| Related Requirements: | | LS-38, LS-98, LS-99, LS- 100, LS-101, LS-102 |
| Related User Stories: | | US-58, US-59 |
| Initiating Actor: | | Employee |
| Actor’s Goal: | | View current events |
| Participating Actors: | | Employee, Database |
| Pre-conditions: | | Employee must be signed in |
| Post conditions: | | The Database allows the employee to add events |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. Employee selects events option | |
| **←** | 2. System verifies which events screen to display based on user type | |
| **←** | 3. System displays employee event screen | |
| **←** | 4. System allows user to view/add events | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. Employee selects events option | |
| **←** | 2. System verifies which events screen to display based on user type | |
| **←** | 3. System displays error, unable to retrieve event information | |

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| **UC-16 - Contact Us Use Case** | | |
| Related Requirements: | | LS-39, LS-103, LS-104, LS-105, LS-106, LS-107 |
| Related User Stories: | | US-60,US-61 |
| Initiating Actor: | | User |
| Actor’s Goal: | | Acquire creators names |
| Participating Actors: | | User, Database |
| Pre-conditions: | | User must be signed in |
| Post conditions: | | System displays contact us screen |
| **Flow of Events for Main Success Scenario** | | |
| **→** | 1. User selects Contact Us option | |
| **←** | 2. System retrieves company information from the database | |
| **←** | 3. System displays Creators’ email address, phone number, and company name. | |
| **Flow of Events for Alternate Scenarios** | | |
| **→** | 1. User selects Contact Us option | |
| **←** | 2. System retrieves company information from the database | |
| **←** | 3. System displays error, unable to retrieve contact information | |

## Traceability Matrix

### Functional System Requirement Based

The table below is a mapping of functional system requirements to use case(s). The Max priority weight is the total number of requirements mapped to an individual use case. The total priority weight is the sum of the requirement's priority weight mapped to a use case.

| **Requirements** | **Priority Weight** | **UC-1** | **UC-2** | **UC-3** | **UC-4** | **UC-5** | **UC-6** | **UC-7** | **UC-8** | **UC-9** | **UC-10** | **UC-11** | **UC-12** | **UC-13** | **UC-14** | **UC-15** | **UC-16** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Login** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **5** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **1** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **3** |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **1** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **1** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Forgot user id** | | | | | | | | | | | | | | | | | |
|  | **4** |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **3** |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Reset password** | | | | | | | | | | | | | | | | | |
|  | **4** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Registration** | | | | | | | | | | | | | | | | | |
|  | **3** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Main Interface** | | | | | | | | | | | | | | | | | |
|  | **4** |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |
|  | **4** |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |
| **Profile** | | | | | | | | | | | | | | | | | |
|  | **4** |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |
| **View books** | | | | | | | | | | | | | | | | | |
|  | **4** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
| **Check in/out** | | | | | | | | | | | | | | | | | |
|  | **3** |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |
| **Work log** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
| **Admin page** | | | | | | | | | | | | | | | | | |
|  | **3** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **5** |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |
| **Admin search page** | | | | | | | | | | | | | | | | | |
|  | **4** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **5** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
| **Add/delete page** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **2** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **1** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
| **Admin set fee and Check out Limits** | | | | | | | | | | | | | | | | | |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
| **Events** | | | | | | | | | | | | | | | | | |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |
| **Contact Us** | | | | | | | | | | | | | | | | | |
|  | **2** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |
|  | **2** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |
|  | **2** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |
|  | **2** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |
|  | | | | | | | | | | | | | | | | | |
| **Max Priority Weight** | | **4** | **5** | **7** | **15** | **2** | **6** | **14** | **5** | **4** | **2** | **7** | **9** | **5** | **4** | **2** | **6** |
| **Total Priority Weight** | | **8** | **16** | **22** | **49** | **8** | **21** | **53** | **21** | **15** | **8** | **26** | **28** | **19** | **10** | **9** | **17** |

**Figure 1. Traceability Matrix Functional Requirement to Use Case**

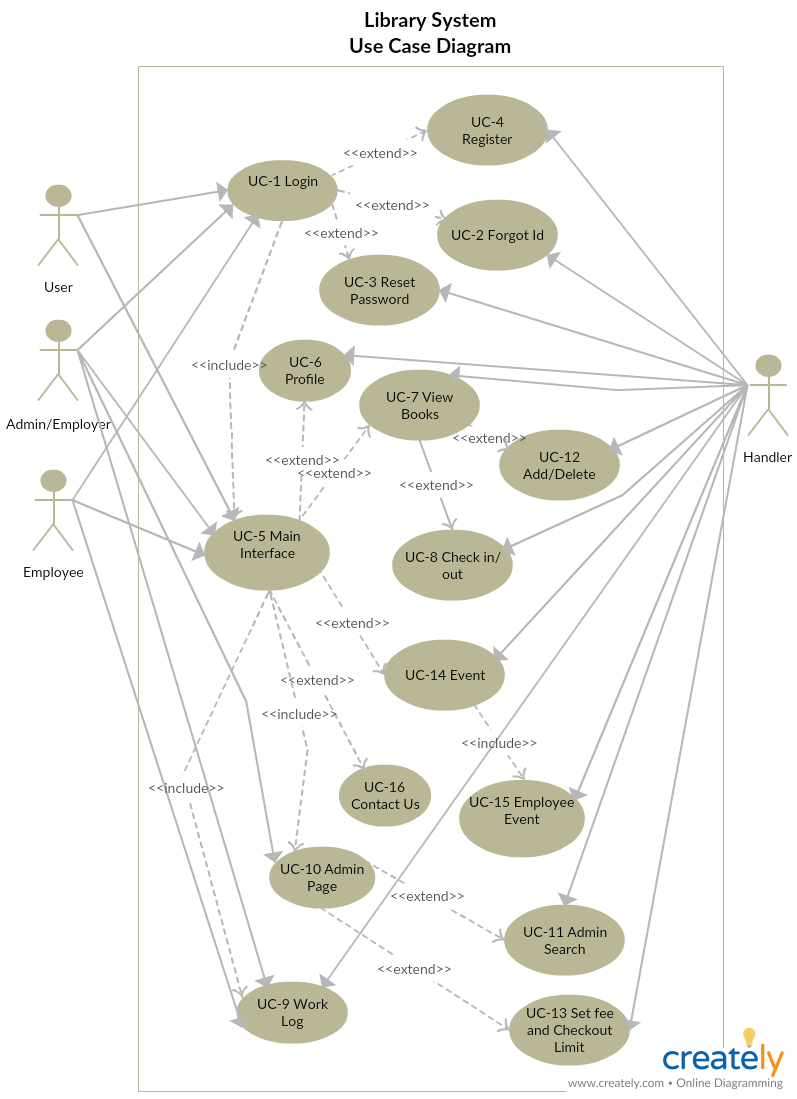
### User Story Based

The table below is a mapping of user story to use case(s). The Max priority weight is the total number of requirements mapped to an individual use case. The total priority weight is the sum of the requirement's priority weight mapped to a use case.

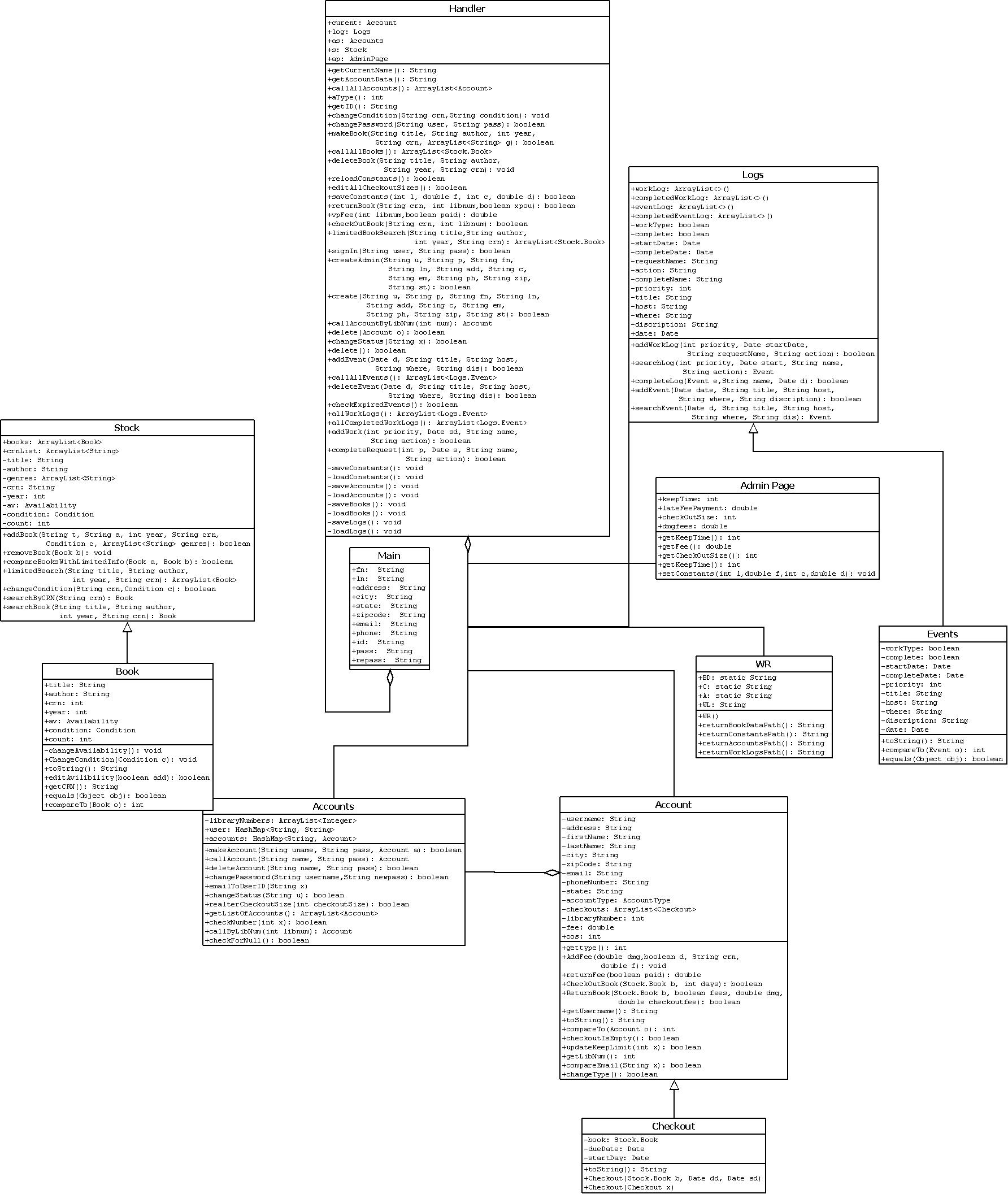
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Requirements** | **Priority Weight** | **UC-1** | **UC-2** | **UC-3** | **UC-4** | **UC-5** | **UC-6** | **UC-7** | **UC-8** | **UC-9** | **UC-10** | **UC-11** | **UC-12** | **UC-13** | **UC-14** | **UC-15** | **UC-16** |
| **Login** | | | | | | | | | | | | | | | | | |
|  | **5** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **5** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **3** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Forgot User ID** | | | | | | | | | | | | | | | | | |
|  | **5** |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **5** |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Reset Password** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Registration** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Main Interface** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  | **X** | **X** | **X** |  |  |  |  |  |  | **X** |  | **X** |
|  | **4** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |
| **Profile** | | | | | | | | | | | | | | | | | |
|  | **3** |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |  |
| **View Books** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |  |
| **Check in/out** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |  |
| **Work Log** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
|  | **2** |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |  |
| **Admin Page** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |  |
| **Admin Search Page** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **1** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
|  | **2** |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |  |
| **Add/Delete Page** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **2** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
|  | **1** |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |  |
| **Admin Set Fee and Checkout Limit** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
|  | **2** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |  |
| **Events** | | | | | | | | | | | | | | | | | |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |  |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |
| 1. **4** | **4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |  |
| **Contact Us** | | | | | | | | | | | | | | | | | |
|  | **2** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |
|  | **1** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** |
| **Max Priority Weight** | | **5** | **4** | **4** | **4** | **2** | **3** | **8** | **4** | **6** | **3** | **5** | **8** | **5** | **3** | **2** | **3** |
| **Total Priority Weight** | | **19** | **16** | **18** | **18** | **9** | **12** | **29** | **13** | **22** | **13** | **16** | **24** | **16** | **13** | **9** | **7** |

**Figure 2. Traceability Matrix User Story to Use Case**

## Use Case Diagram

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## Class Diagram



## Sequence diagram

