

<b>Library Book Loan System</b>	
Supporting Requirements Specification	Date: 21.03.2017



**HACETTEPE UNIVERSITY DEPARTMENT OF  
COMPUTER ENGINEERING  
BBM487: SOFTWARE ENGINEERING LABORATORY**

**SYSTEM-WIDE REQUIREMENTS SPECIFICATION**

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# Library Book Loan System

## System-Wide Requirements Specification

### 1. Introduction

#### 1.1 Goal

In this document, we aim to explain features and purposes of our project. And also we will provide information about system architecture, its details and requirement specifications of our project.

#### 1.2 Scope

This project will be designed to facilitate the work of library staff, it will provide an easy way to library members while they borrowing books.

#### 1.3 Document Overview

This document explains requirements and usage of our project with using Use-Case Diagram, Activity Diagram, Context Diagram and GUI Prototype. And also it explains data model of project with E-R Diagram.

### 2. System-Wide Functional Requirements

Library users and library staff will login to the system with their usernames and passwords. If one of them is not valid then the system will not allow to login. Logged in library users or not logged in people will be able to search for a book in the library system. After search for books request, all books will be shown on the screen according to search criterias.

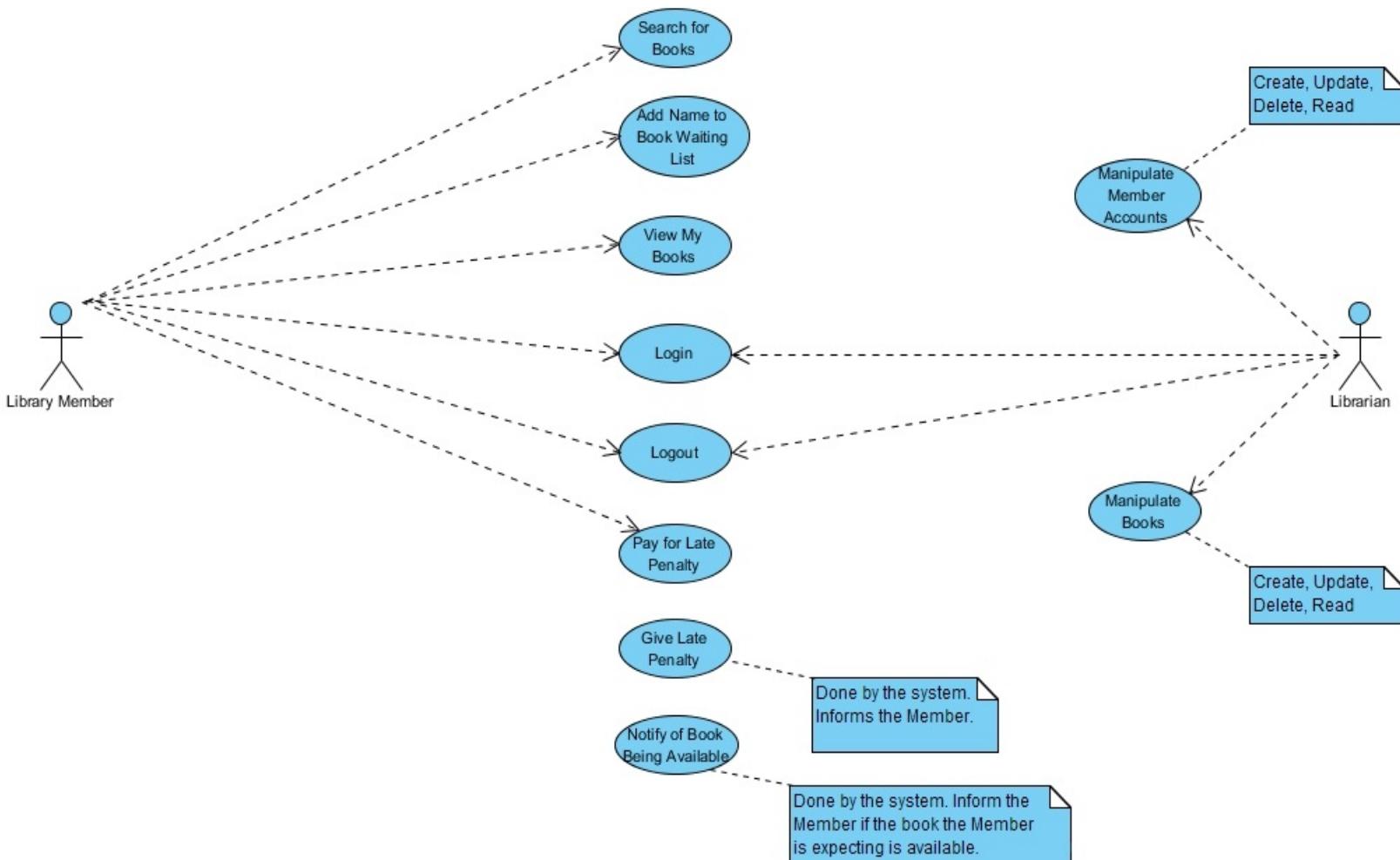
There are two roles in our Library Book Loan System project. First one is Library Member. Library members should be able to login to the system, logout from the system, search for books, add name to book waiting list, view their books, make payment for late penalty. And the second role is Librarian. Librarians should be able to login to the system, logout from the system, manipulate library member accounts and their information, for example, add/delete/update member to/from/in the system. And also they should be able to manipulate books, for example, add/delete/update books to/from/in the system.

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Library member will send a request to borrow a book and consider that the book is not available at that time, then member can add this book to their book waiting list. When the book is being available the system will notify the member about this situation with sending a message via system and via e-mail.

Every book will has a due date. Members who do not deliver borrowed books on time will get some penalties. The system will inform the member about the penalty and how much they owe to the system with sending a message via system and via e-mail.

Related Use-Case Diagram is given below:

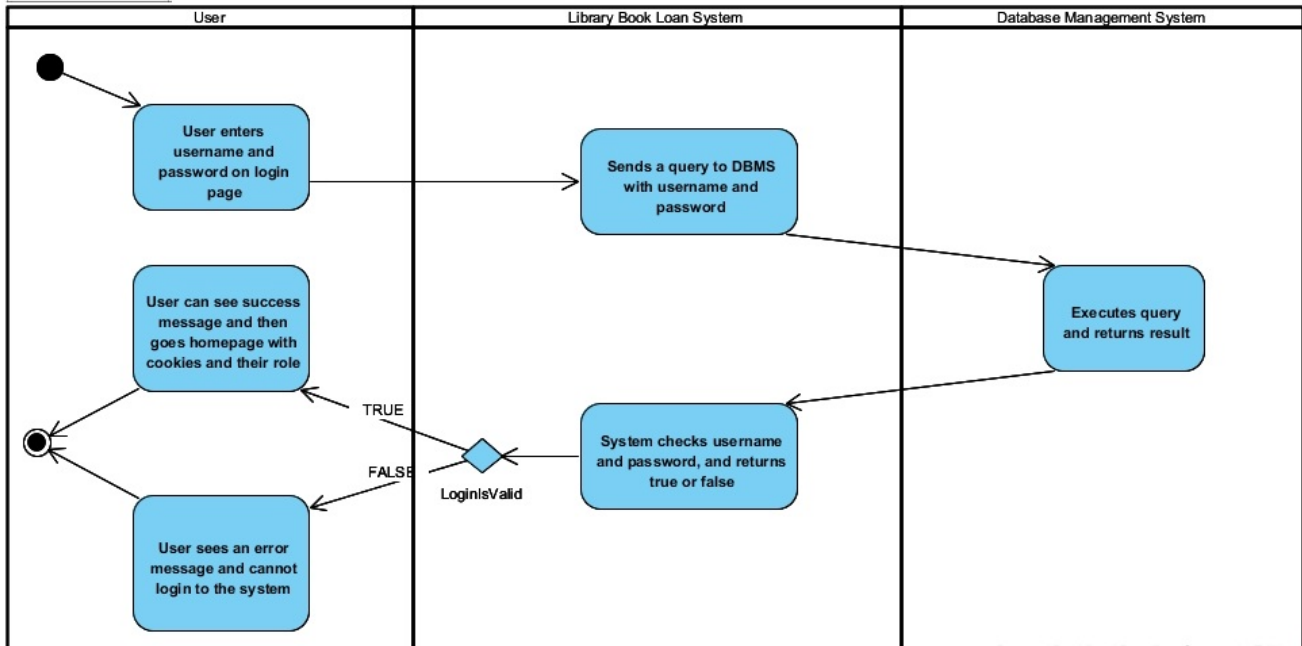


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Here is Activity Diagrams of each Use-Case:

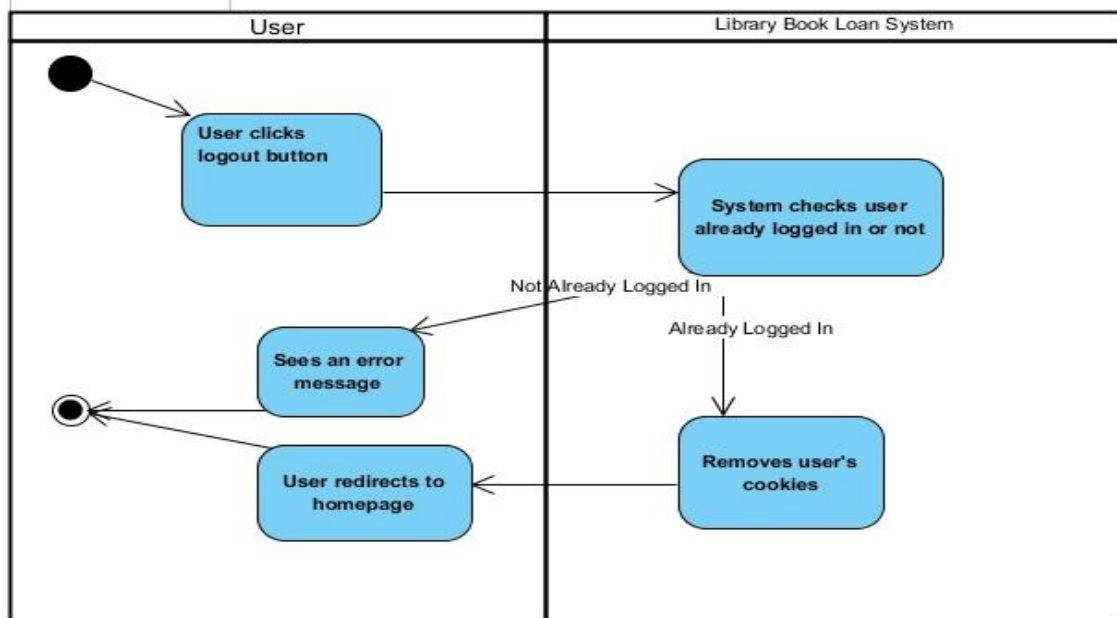
## Use-case: Login

Login Activity



## Use-case: Logout

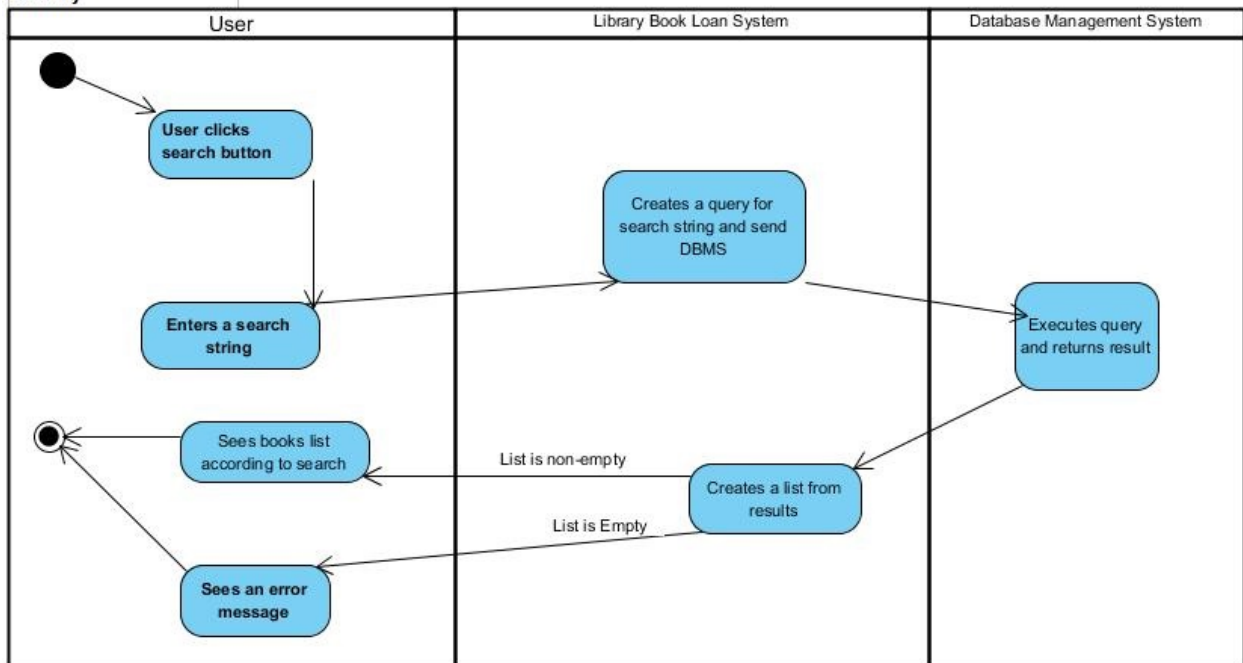
Logout Activity



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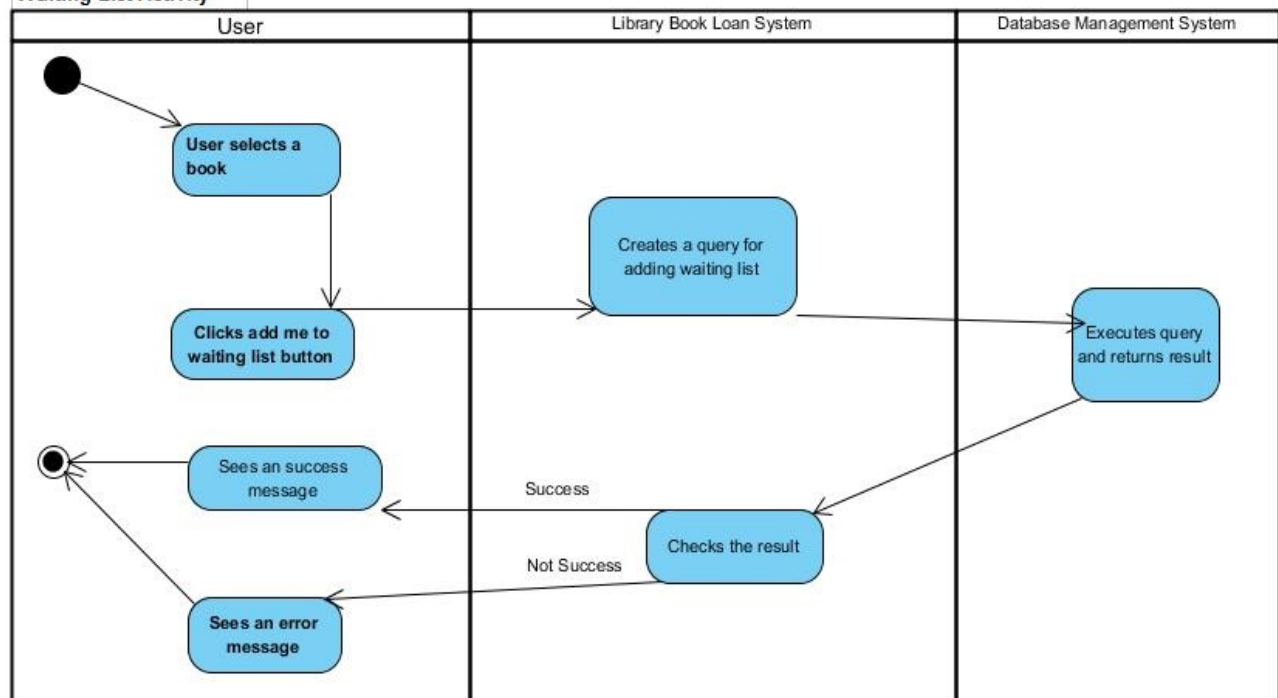
## Use-case: Search for Books

### Search for Books Activity



## Use-case: Add Name to Book Waiting List

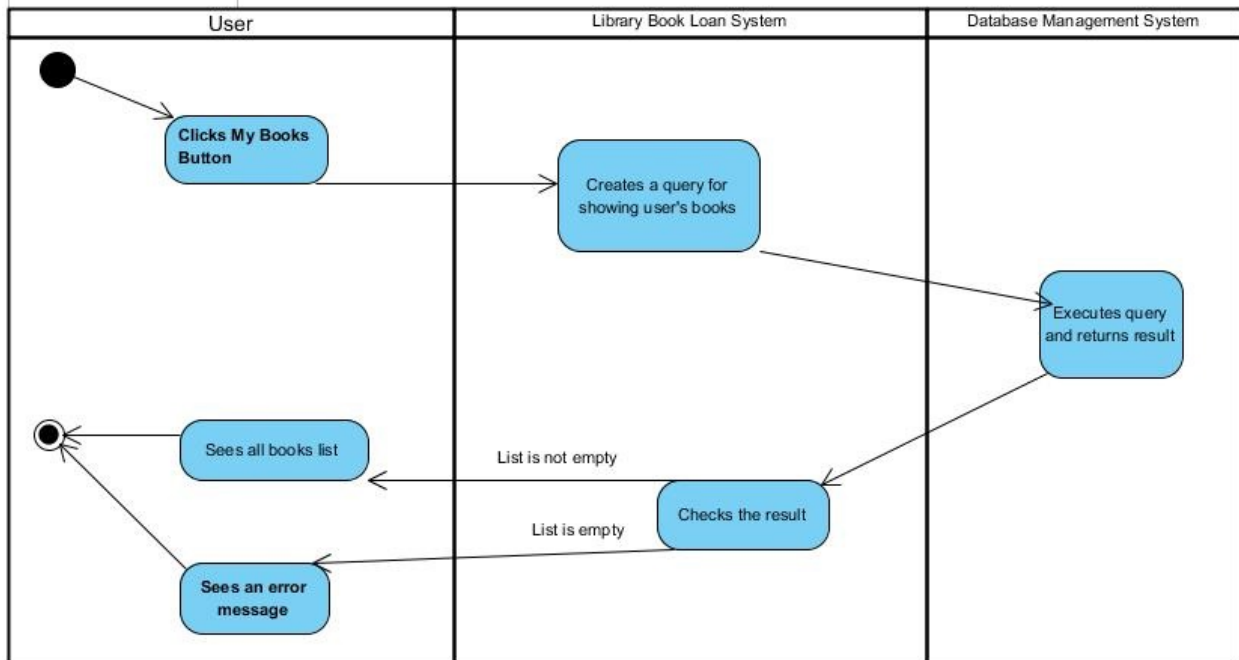
### Add Name To Book Waiting List Activity



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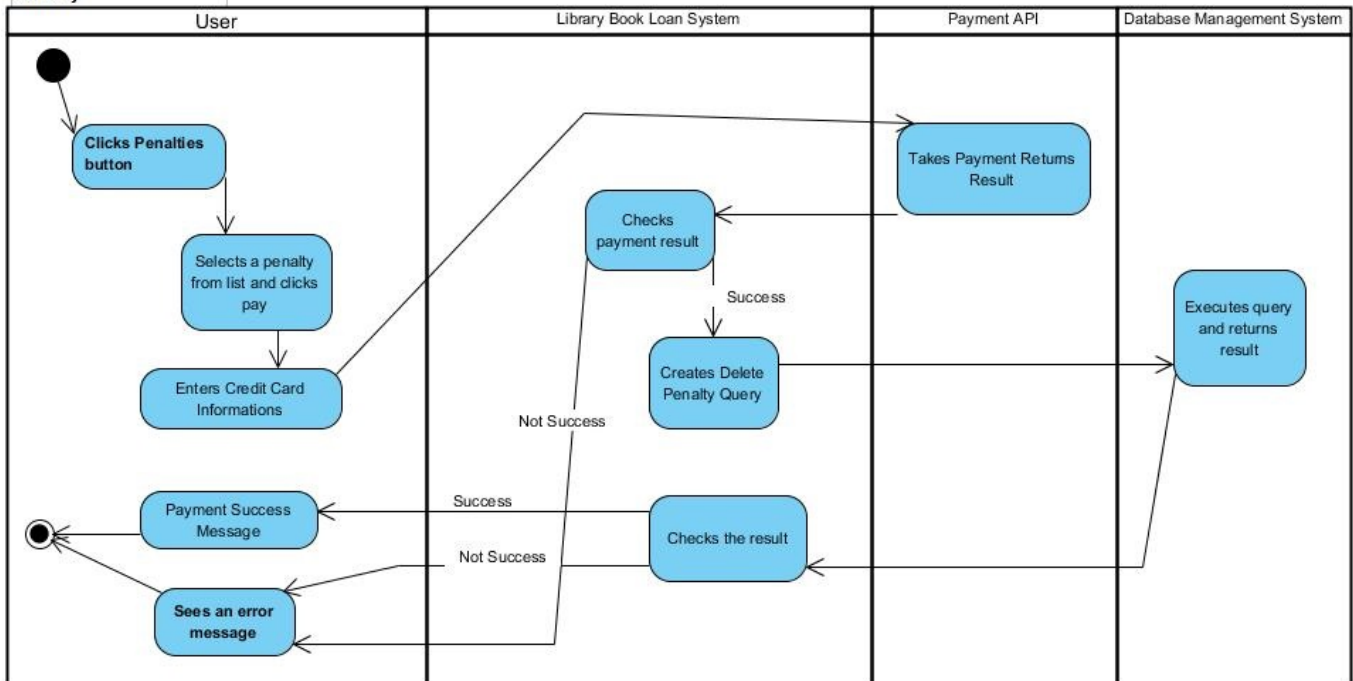
## Use-case: View My Books

View My Books Activity



## Use-case: Pay for Late Penalty

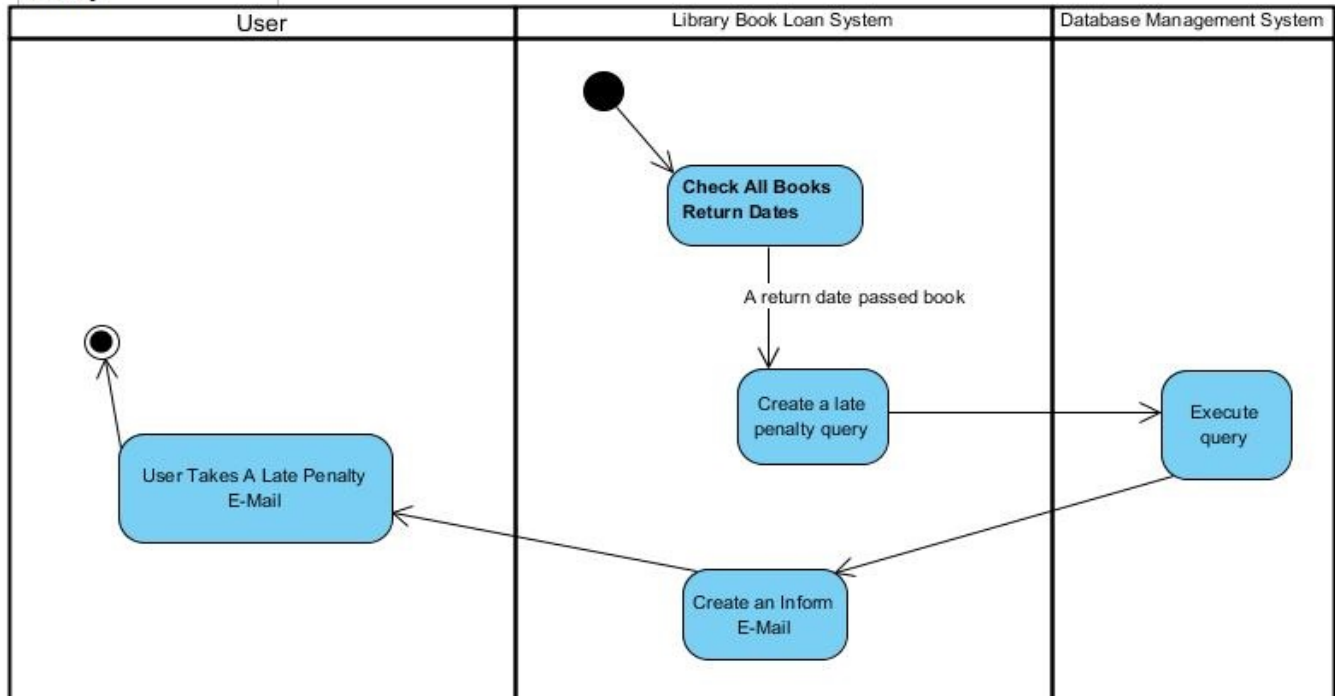
Pay For Late Penalty Activity



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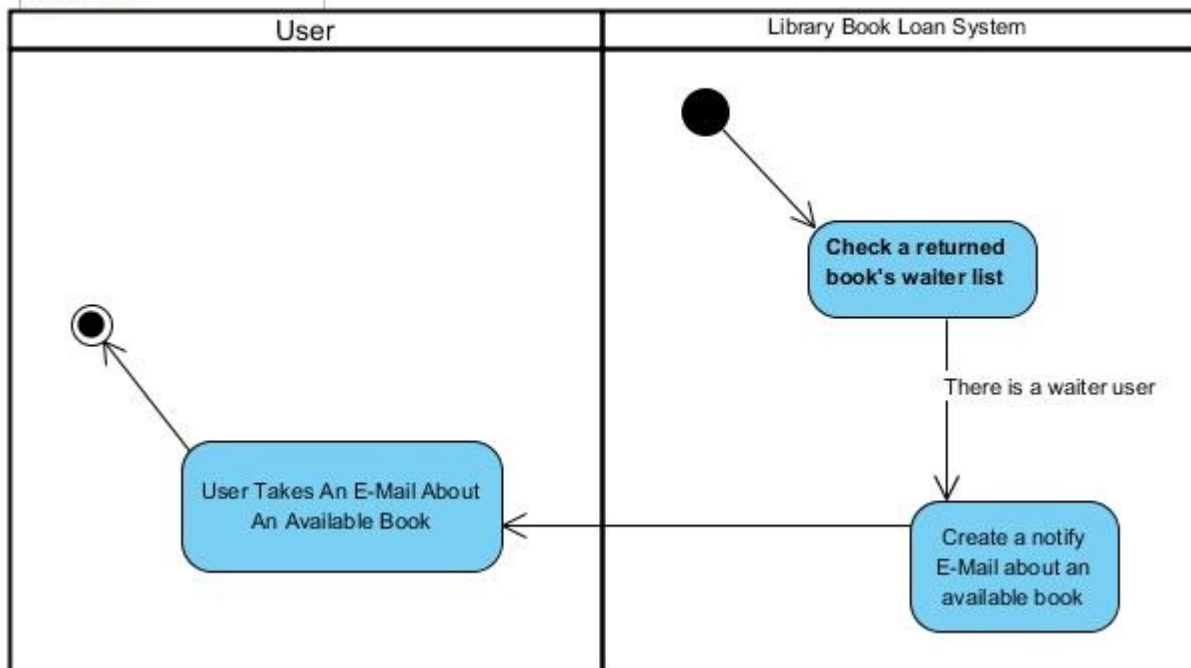
## Use-case: Give Late Penalty

### Give Late Penalty Activity



## Use-case: Notify of Book Being Available

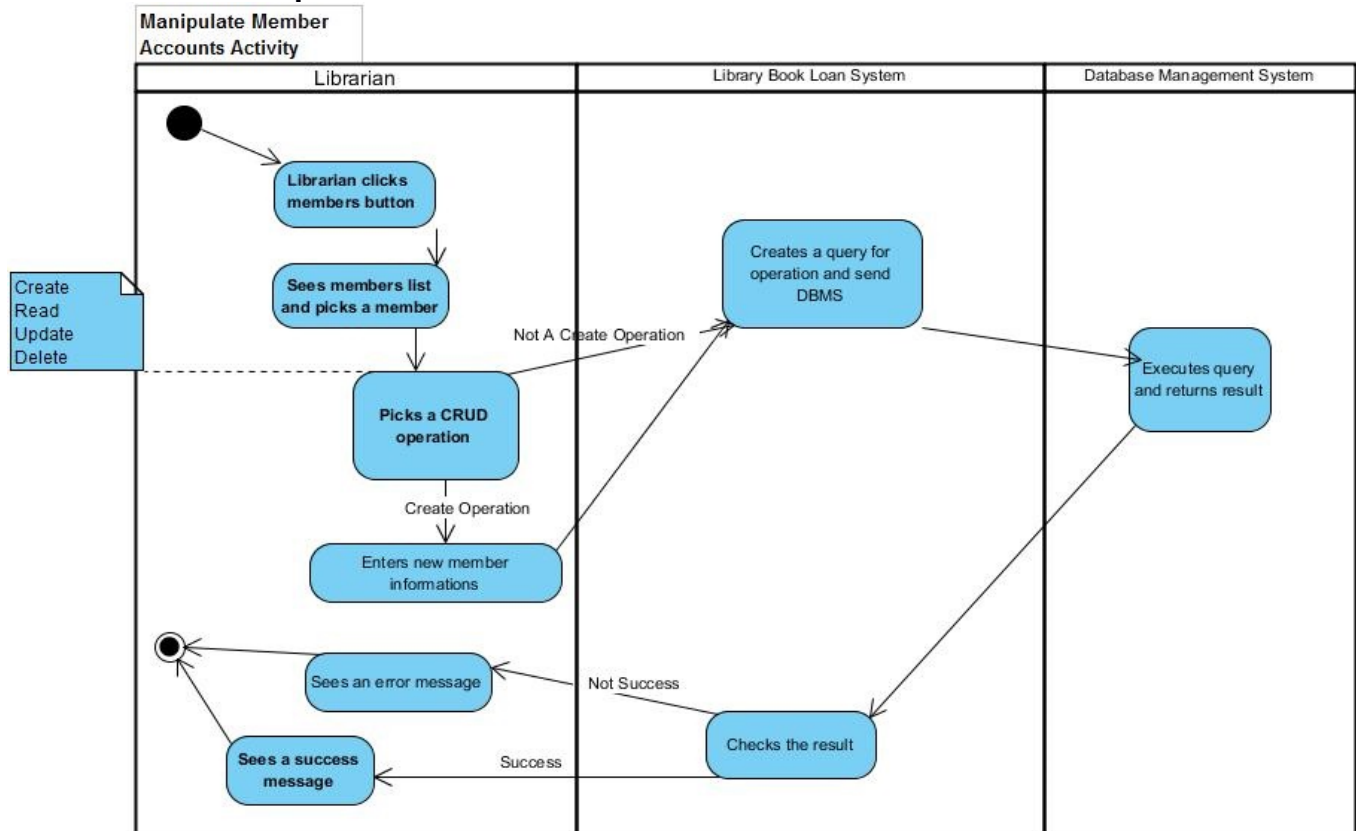
### Notify Of Book Being Available



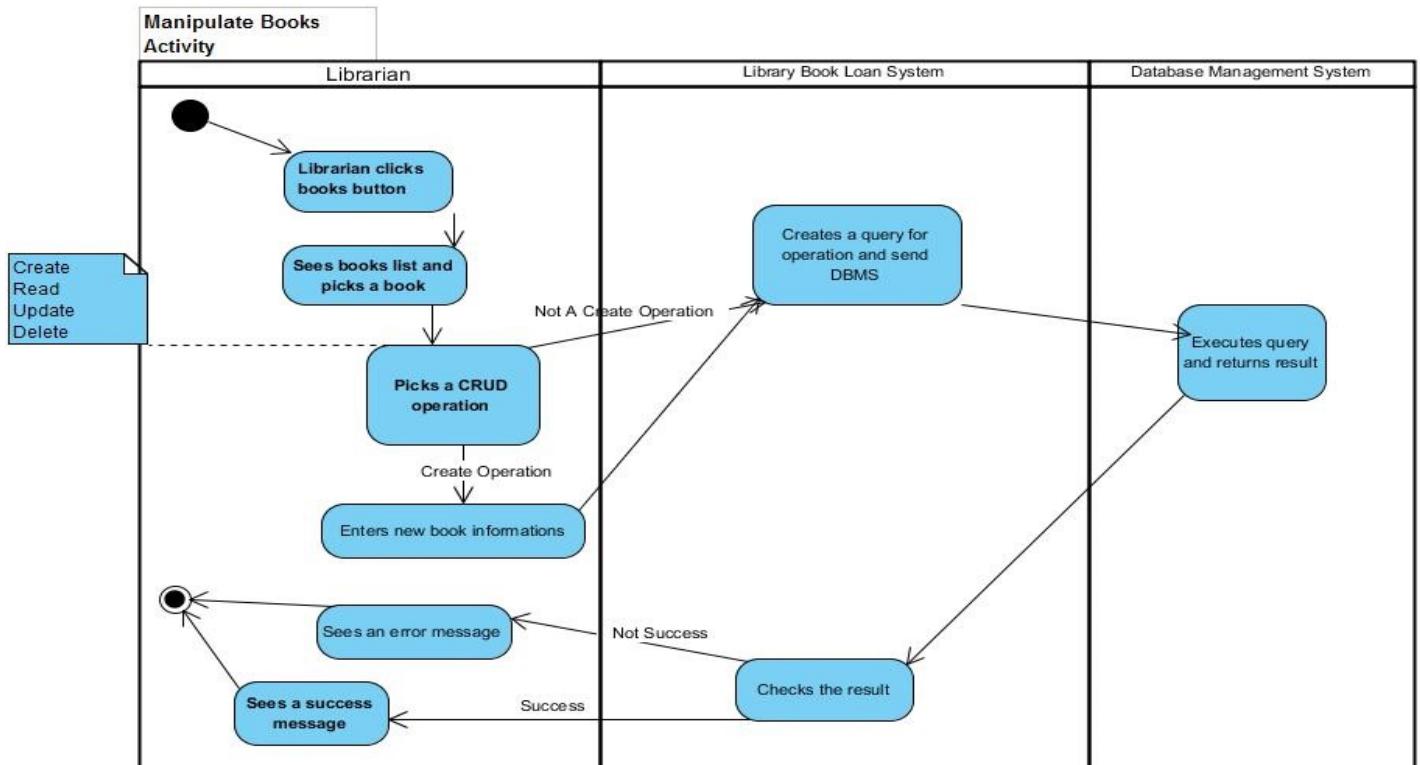


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## Use-case: Manipulate Member Accounts



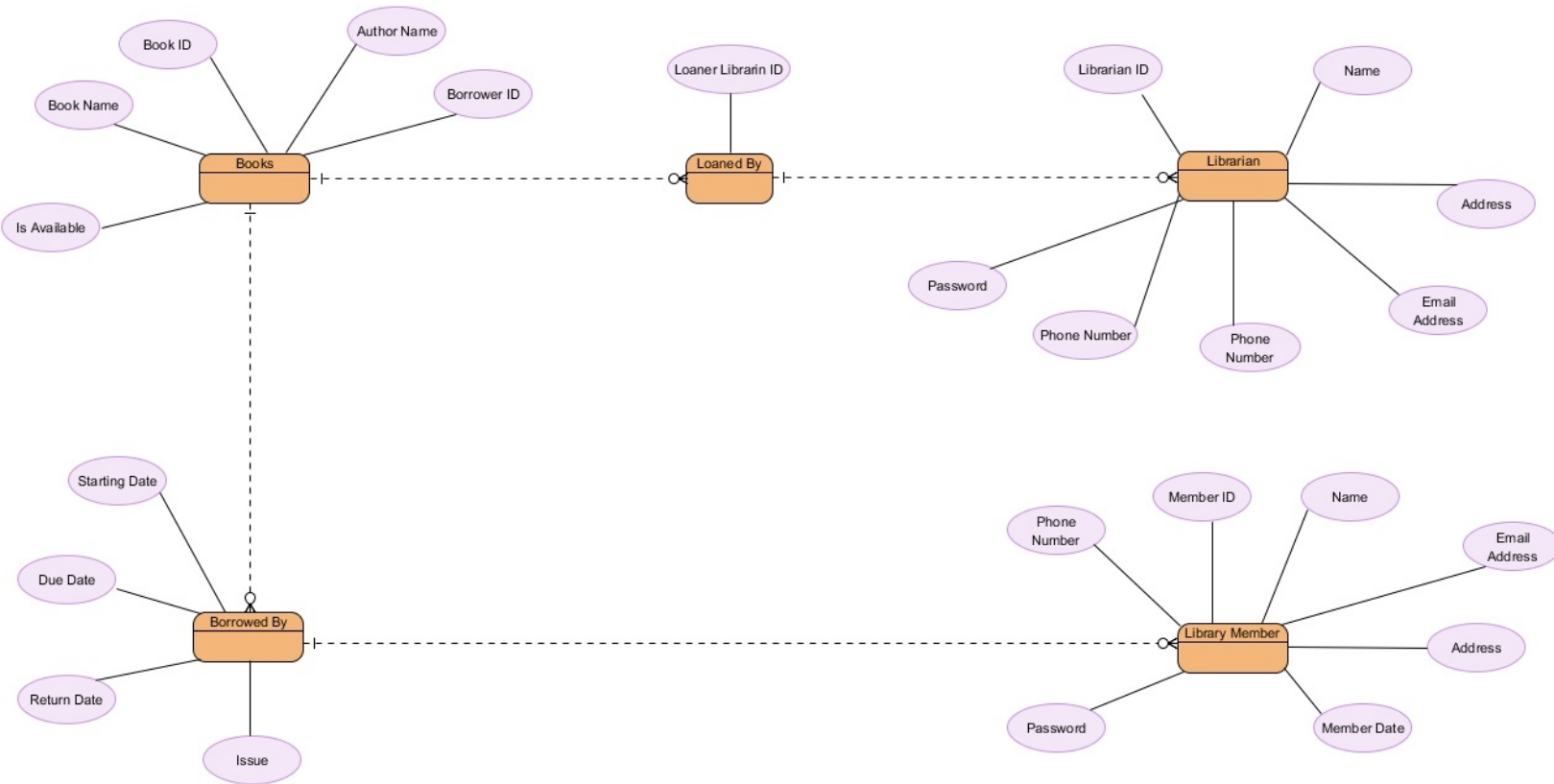
## Use-case: Manipulate Books





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## Data Model – E-R Diagram



## 3. System Qualities

### 3.1 Usability

The library system that being developed by us is aimed as an easy to use system for everyone who uses it. The basics of the system are quite easy. It allows users to see which book they borrowed, when they borrowed it and when they are supposed to return it in user interface. Borrowing a book or adding their names to waiting list is done by a single button when they are monitoring a book. When a user signed in to the system and uses it for the first time it is easy to follow the path they should do for these operations which makes the system easy to use.

The system is planned to be a web based application, so accessing it is so much easier compared to an desktop application.

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### **3.2 Reliability**

When a visitor decides to have an account on the library system, they are having an account with their e-mail address, name and surname. They are also choose a password. The system uses a database to keep all these informations. And since the password is an important information, it is kept in the database as encrypted.

The most important issue that users will come across could be trying to borrow a book at the same time with another user. Other than that when the internet is cut off in the middle of a process if it isn't reach to database it will require redone of it.

The team will consider these problems and try to come up with efficient solutions.

### **3.3 Performance**

The speed of the system is mainly depend on the internet speed of the user. Since it is not a complicated system, it has low response time for processes. Login and logout times for users are depend on the internet speed as mentioned above. But when the system has too many users it may require extra seconds to searching informations on the database.

### **3.4 Supportability**

Since the system being built is a PHP application, it is easily maintainable in terms of user interface. The databases are kept simple, so upgrading or updating the system is easy in that way. In the future anyone who has an experience on PHP and MySQL can handle the system easily.

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## 4. System Interfaces

### 4.1 User Interfaces



The screenshot shows the homepage of the 'KÜTÜPHANE SİSTEMİ'. At the top left is a logo of a stack of books. To the right of the logo is the title 'KÜTÜPHANE SİSTEMİ'. Further right are two buttons: 'KAYIT OL' and 'GİRİŞ YAP'. Below the title is a link 'ANA SAYFA'. The main section is titled 'KİTAPLAR' and contains a search bar labeled 'Kitap Ara'. Below the search bar is a table with four columns: 'Kitabın Adı', 'Yazarı', 'Basım Yılı', and 'Uygunluk Durumu'. The table has one row of data: 'Calikusu', 'Resat Nuri Guntekin', '1922', and 'Uygun'. At the bottom of the page is the text 'Kütüphane Sistemi'.

Kitabın Adı	Yazarı	Basım Yılı	Uygunluk Durumu
Calikusu	Resat Nuri Guntekin	1922	Uygun

a) Not logged in user homepage



The screenshot shows the sign-up page of the 'KÜTÜPHANE SİSTEMİ'. At the top left is a logo of a stack of books. To the right of the logo is the title 'KÜTÜPHANE SİSTEMİ'. Further right are two buttons: 'KAYIT OL' and 'GİRİŞ YAP'. Below the title is a link 'ANA SAYFA'. The main section contains four input fields for 'Ad', 'Soyad', 'Şifre', and 'E-Mail'. Below these fields is a 'KAYIT OL' button. At the bottom of the page is the text 'Kütüphane Sistemi'.

b) Sign up page

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KÜTÜPHANE SİSTEMİ

KAYIT OL GİRİŞ YAP

ANA SAYFA

E-mail :

Şifre :

GİRİŞ YAP

Hesabınız Yoksa Hemen Üye Olun!

Kütüphane Sistemi

c) Login page



KÜTÜPHANE SİSTEMİ

KİTAPLARIMI GÖRÜNTÜLE ÇIKIŞ YAP

ANA SAYFA

HOŞGELDİN aa

KİTAPLAR

Kitap Ara

Kitabın Adı	Yazarı	Basım Yılı	Uygunluk Durumu
Calikusu	Resat Nuri Guntekin	1922	Uygun

Kütüphane Sistemi

d) Logged in user homepage

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The screenshot shows the 'KÜTÜPHANE SİSTEMİ' (Library System) interface. At the top left is a logo of a stack of books. To the right of the logo is the title 'KÜTÜPHANE SİSTEMİ'. Below the title is a link 'ANA SAYFA' (Home Page). On the right side, there are two buttons: 'KİTAPLARIMI GÖRÜNTÜLE' (View My Books) and 'ÇIKIŞ YAP' (Check Out). Below these buttons, on the left, is the text 'HOŞGELDİN aa' (Welcome aa). In the center, the book details are displayed: 'Kitabın Adı: Calikusu', 'Kitabın Yazarı: Resat Nuri Guntekin', 'Basım Yılı: 1922', and 'Uygunluk Durumu: Uygun' (Availability Status: Available). On the right side, there is a button 'KİTABI AL' (Get Book). At the bottom, there is a footer 'Kütüphane Sistemi'.

e) Book Page when the book is available to borrow



The screenshot shows the 'KÜTÜPHANE SİSTEMİ' (Library System) interface. At the top left is a logo of a stack of books. To the right of the logo is the title 'KÜTÜPHANE SİSTEMİ'. Below the title is a link 'ANA SAYFA' (Home Page). On the right side, there are two buttons: 'KİTAPLARIMI GÖRÜNTÜLE' (View My Books) and 'ÇIKIŞ YAP' (Check Out). Below these buttons, on the left, is the text 'HOŞGELDİN aa' (Welcome aa). In the center, the book details are displayed: 'Kitabın Adı: Calikusu', 'Kitabın Yazarı: Resat Nuri Guntekin', 'Basım Yılı: 1922', and 'Uygunluk Durumu: Uygun Değil' (Availability Status: Not Available). On the right side, there is a button 'KİTAP BEKLEME LİSTESİNE EKLE' (Add to Waitlist). At the bottom, there is a footer 'Kütüphane Sistemi'.

f) Book Page when it is not available to borrow

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KÜTÜPHANE SİSTEMİ

KİTAPLARIMI GÖRÜNTÜLE ÇIKIŞ YAP

ANA SAYFA

HOŞGELDİN aa

KİTAPLARIM

KİTAP ARA

Kitabın Adı	Yazarı	Alınan Tarih	Teslim Tarihi

Kütüphane Sistemi

g) User's book list that they borrowed

KÜTÜPHANE SİSTEMİ

KİTAPLARIMI GÖRÜNTÜLE ÇIKIŞ YAP

ANA SAYFA

HOŞGELDİN aa

Kitabın Adı:  
Kitabın Yazarı:  
Alınan Tarih:  
Teslim Tarihi:  
Teslime Kalan Süre:

KİTABI İADE ET

Kütüphane Sistemi

h) User's borrowed book information

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The screenshot shows the 'KÜTÜPHANE SİSTEMİ' (Library System) interface. At the top, there is a navigation bar with buttons for 'KİTAPLAR', 'KULLANICILAR', 'KİTAPLARIMI GÖRÜNTÜLE', and 'ÇIKIŞ YAP'. Below the navigation bar, the title 'KÜTÜPHANE SİSTEMİ' is displayed, followed by 'ANA SAYFA'. The user 'HOŞGELDİN admin' is logged in. The main section is titled 'KULLANICILAR' (Users). Below this title, there is a search bar labeled 'KULLANICI ARA'. A table lists the users:

Ad	Soyad	E-Mail
aa	cc	admin@cs
aa	aa	nn
aa	aa	nn
aa	aa	nn
aa	aa	aa
admin	aa	admin@cs

The footer of the page reads 'Kütüphane Sistemi'.

i) Admin(Librarian) user list



The screenshot shows the 'KÜTÜPHANE SİSTEMİ' (Library System) interface. At the top, there is a navigation bar with buttons for 'KİTAPLAR', 'KULLANICILAR', 'KİTAPLARIMI GÖRÜNTÜLE', and 'ÇIKIŞ YAP'. Below the navigation bar, the title 'KÜTÜPHANE SİSTEMİ' is displayed, followed by 'ANA SAYFA'. The user 'HOŞGELDİN admin' is logged in. The main section is titled 'KULLANICILAR' (Users). Below this title, there is a search bar labeled 'KULLANICI ARA'. A form for editing a user is displayed with the following fields:

Adı :

Soyadı :

E-Mail :

At the bottom right of the form, there are two buttons: 'DEĞİŞTİR' (Change) and 'KULLANICIYI SİL' (Delete User). The footer of the page reads 'Kütüphane Sistemi'.

j) Admin manipulate user page



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KÜTÜPHANE SİSTEMİ

ANA SAYFA

HOŞGELDİN admin

Kitabın Adı :

Yazarı :

Basım Yılı :

KİTABI EKLE

Kütüphane Sistemi

k) Admin add book page

KÜTÜPHANE SİSTEMİ

ANA SAYFA

HOŞGELDİN admin

Kitabın Adı : Calikusu

Yazarı : Resat Nuri Guntekin

Basım Yılı : 1922

Uygunluk Durumu : Uygun

DEĞİŞTİR KİTABI SİL

Kütüphane Sistemi

l) Admin manipulate book page

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KİTAPLAR		
<div>Kitap Ara</div>		
	Basım Yılı	Uygunluk Durumu
ekin	1922	Uygun
Kütüphane Sistemi		

m) Searching books in main page

#### 4.1.1 Look & Feel

The interface is developed with developers perspective. The colors and the fonts are appropriate for a library system. The client wants an easy system to use. For that purpose there are buttons that are guidances for users. It is also easy for admin to manipulate books and users with text boxes.

#### 4.1.2 Layout and Navigation Requirements

A user can see their books on a list. When they clicked on a certain book they can see the information for it and they can return it on that page. The system layout is designed to keep related things close such as updating or deleting a book can be done in same page.

#### 4.1.3 Consistency

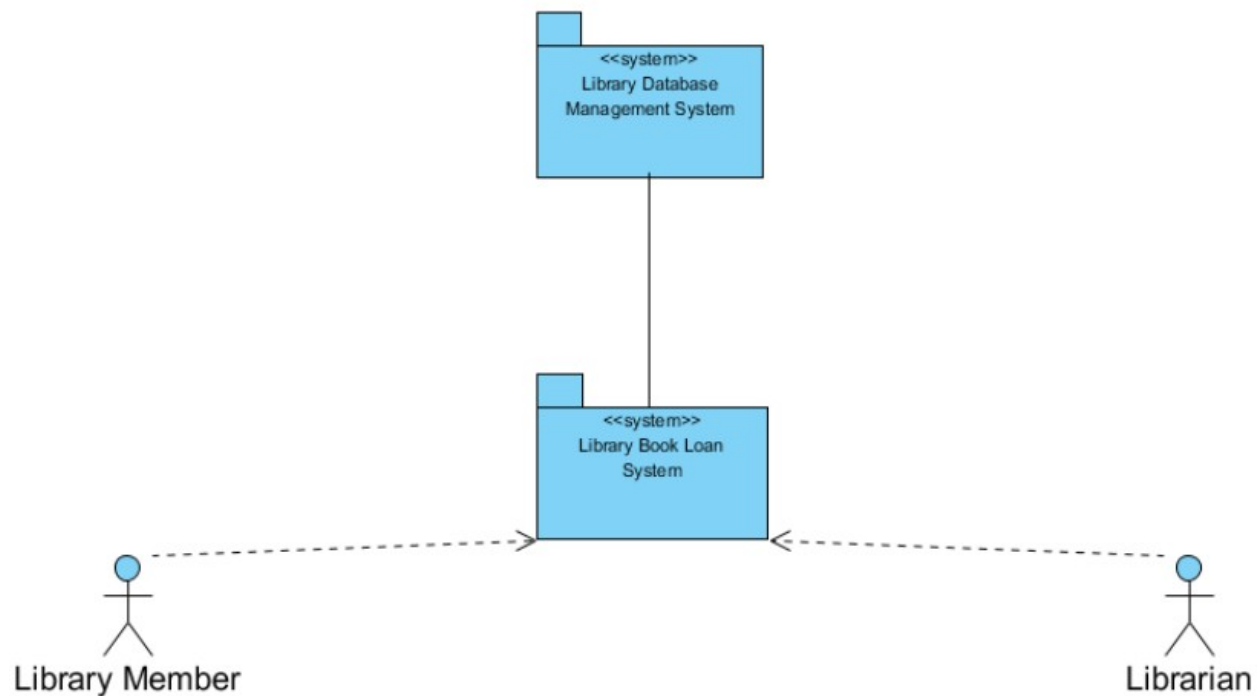
The user interface has same button types for every operation. The listing types are also same in books, users and users' books. When admin wants to manipulate a data such as a book's or a user's information it is always shown in text boxes. If it is a new add boxes will be empty but if it an update operation it will be full with previous data this way it is easy to manipulate them. The system has same footer and header style for every type of user only there are different number of buttons for their authority.

#### 4.1.4 User Personalization & Customization Requirements

Since every user type has different authorities there are some differences on their interface based on these authorities. For example when a books information page is opened, signed up user can see a button under the page to borrow it or add their names to waiting list but not signed up user cannot see these buttons. Every signed up user can see their books that they borrowed with dates.

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## 4.2 Interfaces to External Systems or Devices



Our system works with a database management system and one use case requires a payment api. We are using CRUD (Create-Update-Delete) operations for a library member and books, and we are keeping the informations in a database, so we need a Database Management System. Also we have a Pay for Late Penalty function on program so we need a payment api.

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### 4.2.1 Software Interfaces

All member and book operations in the program has some queries on database. Our system creates a query and sends it to database management system. We need a executer Database Management System (DBMS) to execute these queries.

### 4.2.2 Hardware Interfaces

Our program will be web-based. So we need only a server to host our program. Also this server will keep the database and DBMS, it will connect with payment api, too.

### 4.2.3 Communications Interfaces

In our Library Loan Book System we have penalty for late returns. Every user will have a certain points when they first register to the system. When they will be punished for late deliveries, they will lose some points for it. On the other hand, every time they return a book they will get some points for it.

## 5. Business Rules

### 5.1 <Taking A New Book>

#### 5.1.1. First pay the penalty

If a user has a late penalty then user can not take a new book before the pay the penalty.

#### 5.1.2. Limit is 3 books

A user can not take more than 3 books.If a user has 3 books of library,then for a new book user should return least one.

### 5.2 <Creating a new account>

#### 5.2.1. One e-mail for one account

In the system e-mail addresses are unique so,with one e-mail address you can create only one member account.

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### **5.3. <Deleting an account>**

#### **5.3.1. Delete Constraint**

To delete an account, there should not be any books lent by that account.

## **6. System Constraints**

We will have a web-based system, therefore the user needs an internet connection to use system. Also we have all user contact informations to notifies. If a contact information is missing then the notify system will create an error. That will limit our data usage and keeping strategy. System will be located in a remote server, so we need to backup database in regular periods because it has not recover options on remote server.

## **7. System Compliance**

### **7.1 Licensing Requirements**

We will use APACHE server, PHP and MySQL. All these softwares are open source so we don't need any licensing requirements.

### **7.2 Legal, Copyright, and Other Notices**

We need to show our Payment API supporter on system to legal usage and security standards. Also for book informations we will need copyrights of printing houses.

### **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 on whole developing stages and we will remove the faults which causes huge costs.

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## 8. System Documentation

Our developer will create a guide documentation. System will be web-based so users can reach it from everywhere and they will need help to usage of system. The developer has the whole knowledge about the usage of system so she will make a guide about documentation. It will include;

- Creating a new member account
- Manipulating members for librarian
- Manipulating books for librarian
- Login / Logout activities
- Pay for late penalty
- Add name to book waiting list
- Taking a book