SOFTWARE REQUIREMENTS SPECIFICATION

Version: 1.1

Date: 29.12.2013

MobileLibrary Project

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Preface

This document contains the system requirements for MobileLibrary Project. This document is prepared according to scaled version of the “IEEE Recommended Practice for Software Requirements Specification – IEEE Std 830 – 1998” for CENG491.

This Software Requirements Specification provides a complete description of all the functions and specifications of the MobileLibrary project.

The first section of this document includes purpose, scope, references, definitions and overview of the document.

The second section of this document includes product perspectives, the use cases of MobileLibrary project, assumptions and dependencies. Use cases are documented for helping the requirements to be understood clearly.

The third section of this document includes specific requirements of the MobileLibrary project.

The fourth section of this document includes data model and description of the project.

The fifth section of this document includes team structure, planning and process model of the project.

The final section of this document includes conclusion of the project

Change History

VERSION NUMBER	DATE	NUMBER OF FIGURE, TABLE OF PARAGRAPH	A* M* D*	TITLE OF BRIEF DESCRIPTION
1.0	26.10.2013			Original
1.1	29.12.2013		A - Features M- Interface Requirements M- Relations M- Estimation M- Process Model	First Update

*A - added

*M - modified

*D - deleted

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1 Introduction

1.1 Problem Definition

METU Library users are often not able to utilize all library services that are provided because of space barrier. In another wording academicians, students and visitors are not able to view their library account, renew borrowed books, pay library debt, see announcements of the day, recommend a library material, and search library catalog and reserved books by using their mobile devices.

1.2 Purpose

The purpose of this document is to present a detailed description of the MobileLibrary, an android application. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for the acquirer which is the owner in this case.

1.3 Scope

This software system will be a mobile android application for any user of METU Library. This system will be designed to help the user to

- View their library account
- Renew borrowed books
- Pay library debt
- See announcements of the day,
- Recommend a library material
- Search library catalog and reserved boks
- Borrow materials by using mobile devices
- View the situations of the carells (studying rooms)

1.4 User and Literature Survey

There are many projects which are similar to our project. But here we will pinpoint just two of them. The first one is St. Thomas University Library application that searches for books, movies and e-content, reviews library account and renew items. Moreover users can connect directly to their library blog or follow on Facebook. If the user have a research question by sending them directly from his/her mobile device.

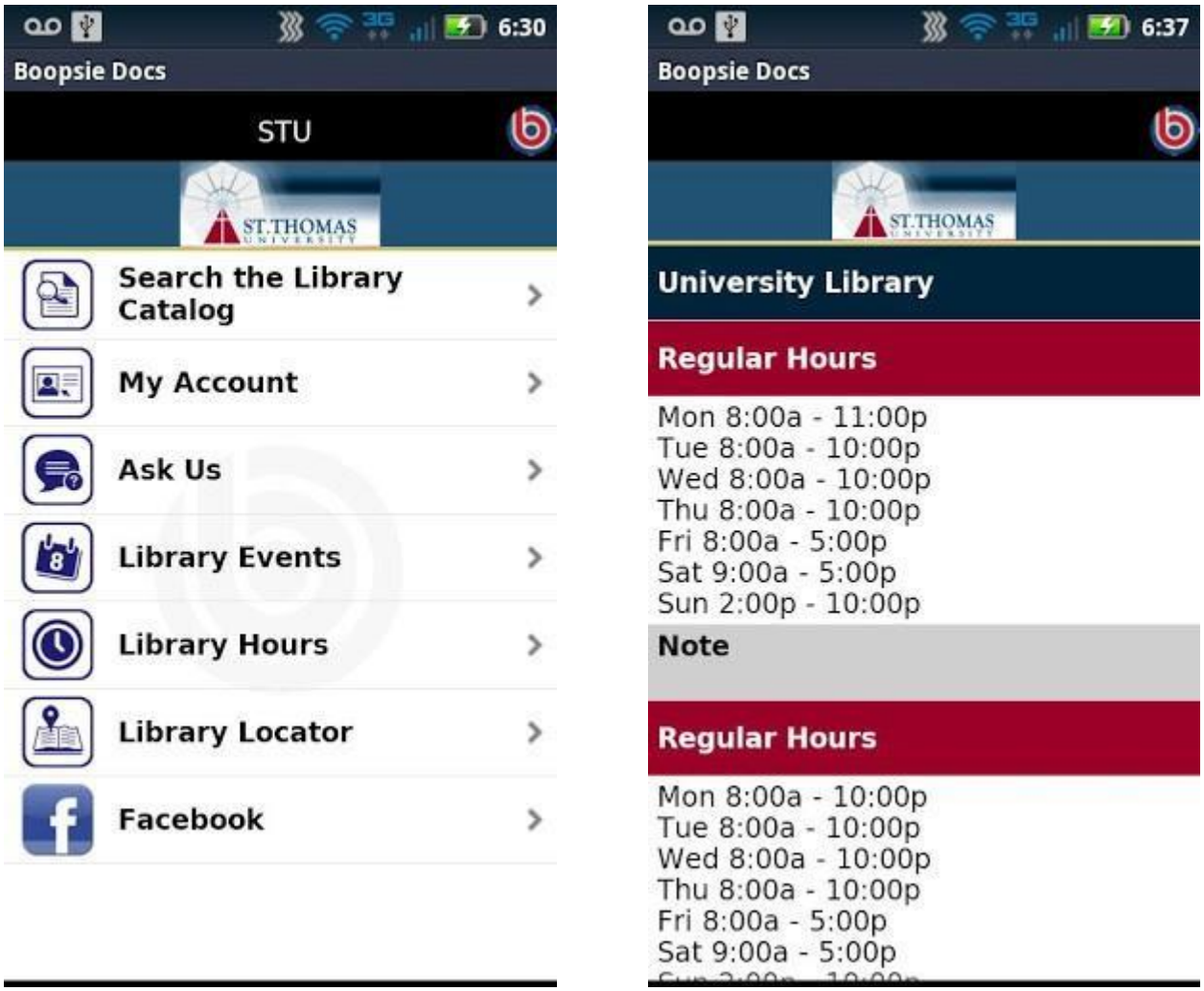


Figure 1 - Screenshots from the St. Thomas University Library application

The second program is Ball State University Library which is a android mobile application finding full text in electronic journals and research databases, checking hours and calendars for Bracken Library, request and renew items via users CardCat account. To access these provided facilities there will quick links to all of them. Furthermore, when searching for a book there is no need to specify library materials “Author” or “Subject” just typing what you are looking for will be enough.

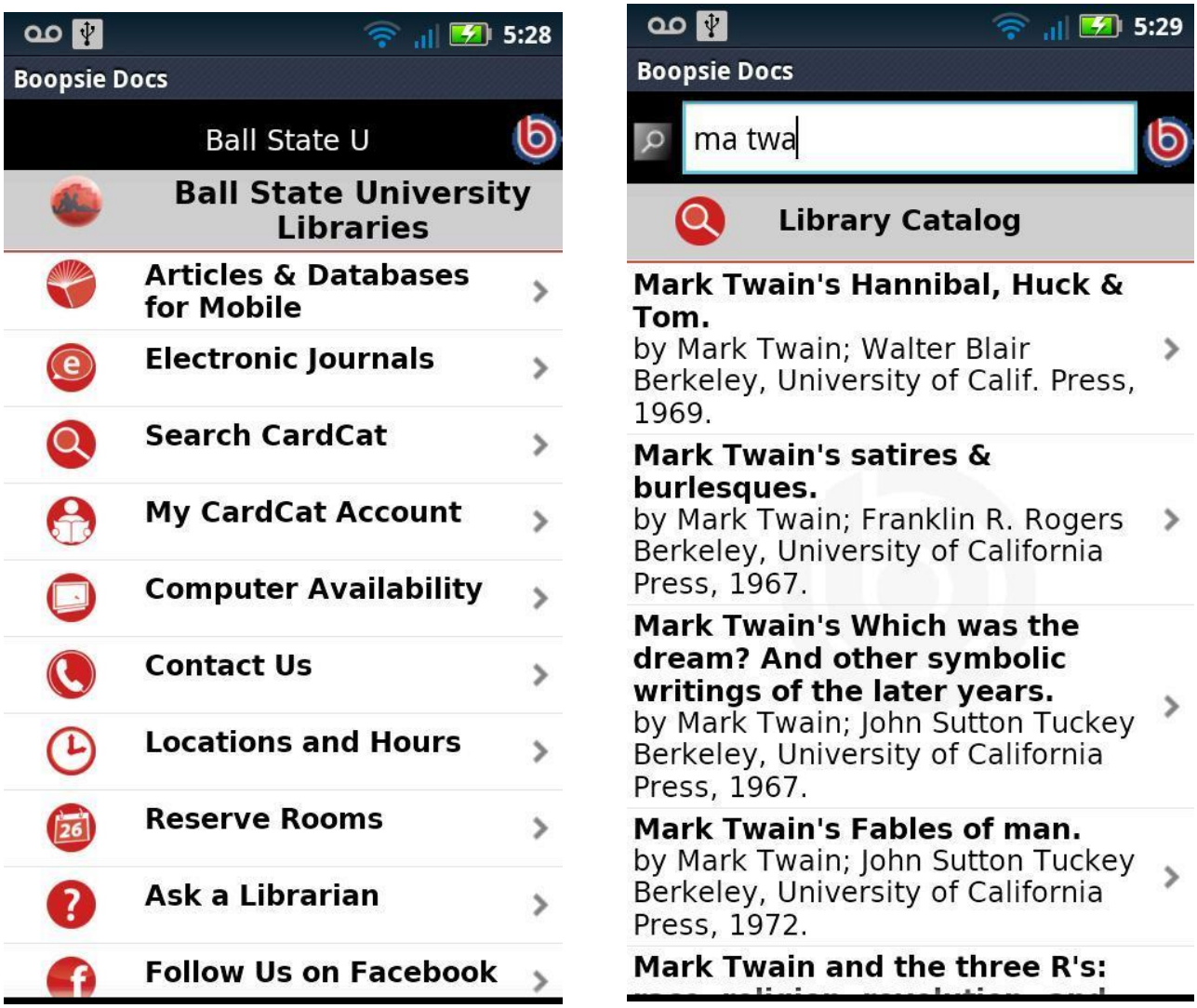


Figure 2 - Screenshots from the Ball State University Library application

1.5 Definitions and Abbreviations

Term	Definition
Database	Collection of all the information monitored by this system
User	METU Library user
Android	A mobile device operating system developed by Google Inc
ISBN	The International Standard Book Number (ISBN) is a unique numeric commercial book identifier.
IEEE	The Institute of Electrical and Electronics Engineers (IEEE) is a professional association headquartered in New York City that is dedicated to advancing technological innovation and excellence.
Software Requirements Specification	A document that completely describes all of the functions of a proposed system and the constraints under which it must operate. For example, this document

1.6 References

IEEE STD 830-1998, IEEE Recommended Practice for Software Requirements Specifications IEEE Computer Society, 1998.

1.7 Overview

The next chapter, the Overall Description section, of this document gives an overview of the functionality of the product. It describes the informal requirements and is used to establish a context for the technical requirements specification in the next chapter.

The third chapter, Requirements Specification section, of this document is written primarily for the developers and describes in technical terms the details of the functionality of the product.

Both sections of the document describe the same software product in its entirety, but are intended for different audiences and thus use different language.

2. Overall Description

In this part, background information about specific requirements of the system will be provided briefly. General issues that affect the product and outline of the functional requirements will be mentioned, too.

2.1 Product Perspective

Our system will consist of three components.

1- Android application

2- Restful Web Service

3- Database

Users reach to the functions of the system via android application which is connected

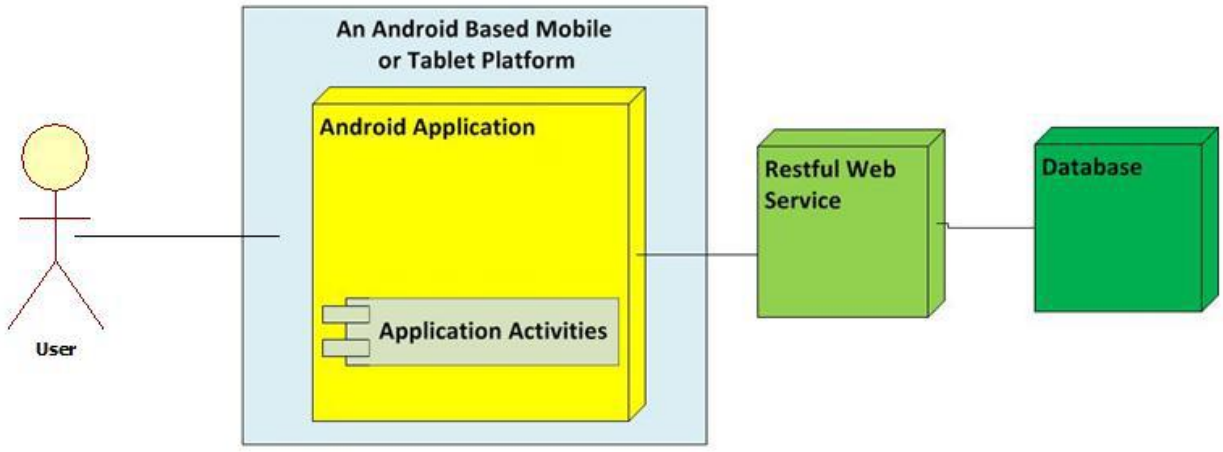


Figure 3 - Product Perspective

2.2 Product Features

Generally there will be two seperate type of user for our program these are METU users and guest users.

Guest users will be able to search the materials int the METU Library and view their situations (whether they are available for borrowing or not). They also will be able to view the announcements of the day and situations of the carells.

Metu users will be able to use all the services provided for guest users. Also our program will provide some special services for Metu users. By using our program, Metu users will be able to view their accounts, pay their library debts with their credit card, make recommendations for Metu Library, borrow the materials by using their mobile devices, hold the library materials and extend the deadlines of the borrowed materials.

2.3 Constraints, Assumptions and Dependencies

- The user is expected to be a METU Library user or visitor.
- We will use ISBN (International Standard Book Number) to identify a book.
- Privacy of users will be protected.

3. Specific Requirements

In this section and its subsections, we will explain all the software requirements to a level of detail sufficient to enable designers to design a system to satisfy those requirements, and testers to test that the system satisfies those requirements.

3.1 Interface Requirements

Basically the system can have only one interface which is between the user and the application. In this interface, there will be different screens available for the different purposes. The interfaces and their intended usages are as below;

Start-up Screen: This screen is shown at the sarting of the application. On this screen user can login the system or go to the menu for guest users.

User Menu Screen: This screen is shown when the user login the system. With this screen, user can go to the search menu, scan menu, announcements menu, payment menu, and carell menu.

Guest Menu Screen: This screen is shown if the user does not login the system. With this screen, users can go to search menu, announcements menu, carell menu and login menu.

Search Screen: This screen is shown when the user wants to make a search. In this screen user can select the search type and write the keywords in a text field.

Announcements Screen: This screen is shown when the user wants to view the announcements. In this screen, the announcements about the METU Library are listed.

Payment Screen: This screen is showed when the logged users want to pay their debts for METU Library. In this screen, users can enter the information about their credit cards and pay their debts.

Scan Screen: This screnn is showed when the logged users want to borrow a material in the METU Library with their mobile devices. With this screen users can scan the barcode of the book and borrow these books.

Carell Screen: This screen is showed when the users want to view the situations of the carell in the METU Library. With this screen, users can be informed about the available carell in the METU Library.

Location Screen: This screen is showed when the users want to view the locations of the materials in the METU Library. This screen helps users to decrease the time for finding the materials in the METU Library.

3.2 Functional Requirements

This section outlines the use cases for user.

3.2.1 User Use Cases

The user has the following sets of use cases:

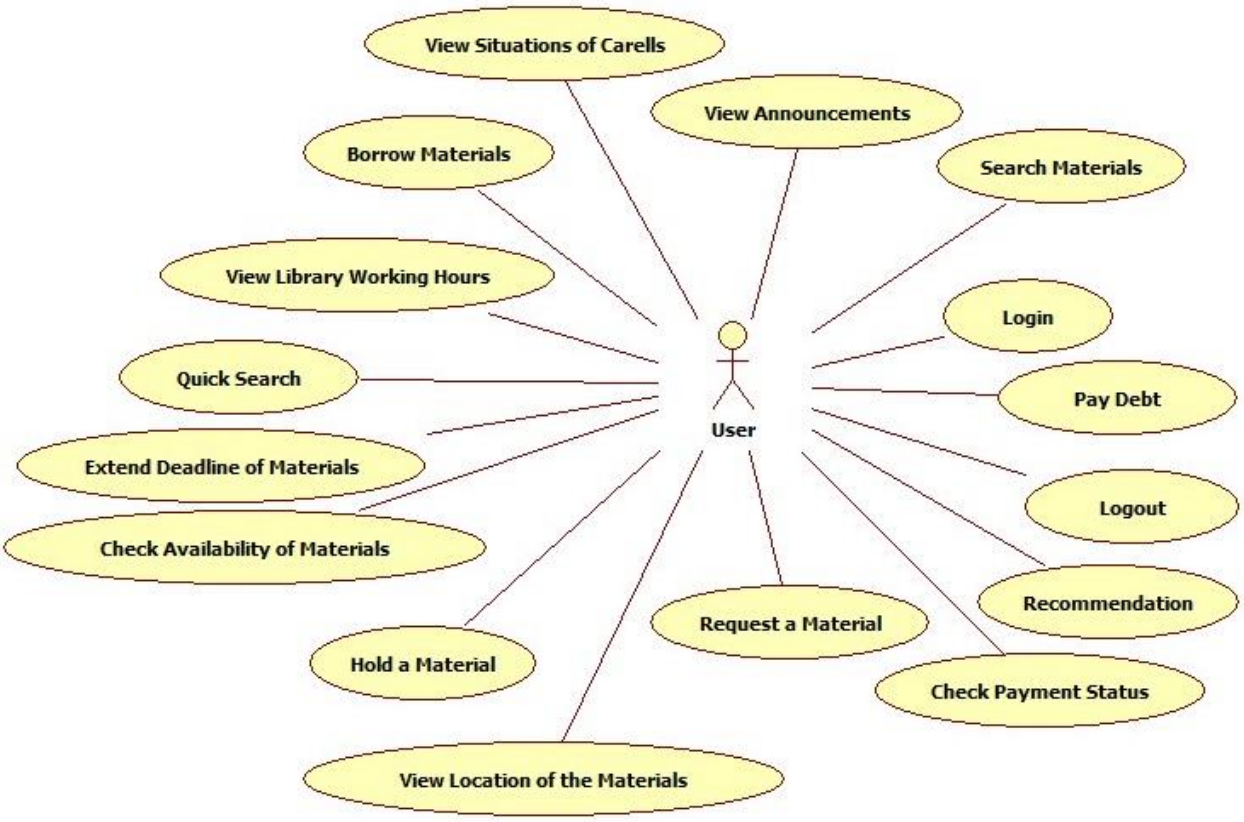
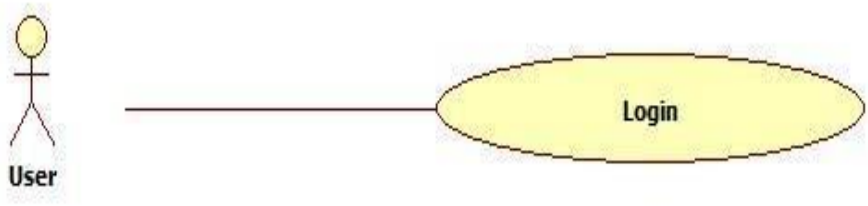


Figure 4 - User Use Cases

3.2.1.1 Use Case: Log in

Diagram:



Brief Description:

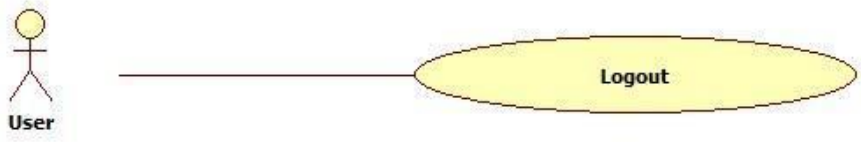
This use case diagram provides users to login into a system. In order to use this use case, user should start METU Library application.

Step-by-step Description:

1. The user enters the METU username, password and selects the Login
2. The system checks the user information
3. If the user gives right information, then system redirects the user into main menu page of METU library
4. If the user does not give right information, then system wants user to recheck username and password

3.2.1.2 Use Case: Log out

Diagram:



Brief Description:

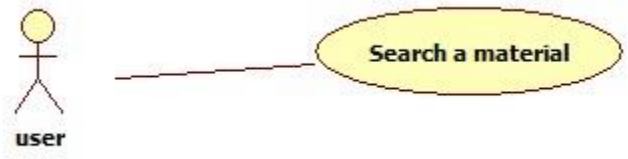
This use case provides users to log out METU accounts. The user should logged into a system in order to log out from the account

Step-by-step Description:

1. The user clicks into a logout button
2. If the user successfully leave from the system, the application redirects user into a main page ot the METU library application

3.2.1.3 Use Case: Searching a material

Diagram:



Brief Description:

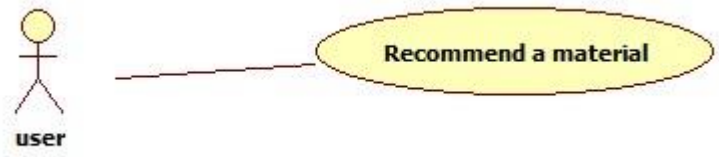
The user can use this use case whether s/he logins into system. S/he can search every kind of books with this use case.

Step-by-step Description:

1. The user clicks into search button and the system displays searching page of the system
2. The user selects the suitable category and writes keyword about the book.
3. The system finds related books and shows them up.

3.2.1.4 Use Case: “recommend a material”

Diagram:



Brief Description:

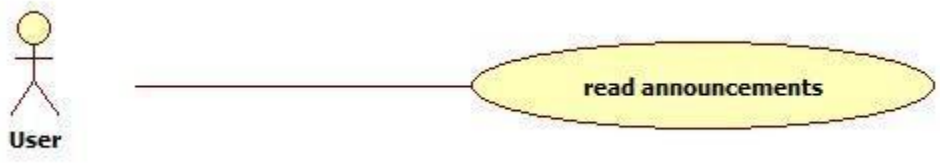
The user can make a recommendation about new books, journals in order that the library managers can buy them into the library. It is enough that the user login into the system in order to make recommendation. Therefore, before this use case, use case “login” should be used.

Step-by-step Description:

1. The user starts application and login into system, and the system redirects the user into main page
2. The user clicks a recommendation button and the system shows the recommendation page
3. The user enters the information about the desired books and clicks the send button

3.2.1.5 Use Case: Read an announcements

Diagram:



Brief Description:

The user can read all announcements which is published in METU library application. There is no restriction to use this use case.

Step-by-step Description:

1. The user starts application and clicks into Login button
2. The system displays a login page of the METU library application and the user can see all announcements locating below of the login button

3.2.1.6 Use Case: Extend deadlines of the borrowed materials

Diagram:

Brief Description:

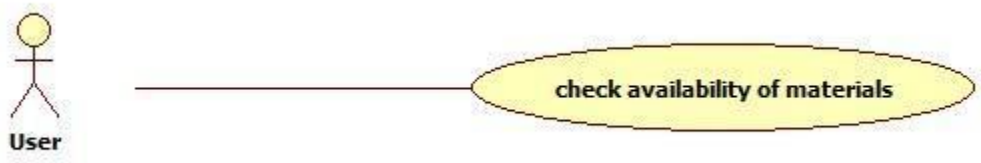
After the user starts application, s/he should login into a system. Therefore, before this use case, the use case “login” should be finished successfully.

Step-by-step Description:

1. The user starts and logins into a system.
2. After the system visualizes Main menu page, the user clicks the borrowed books button in the Menu
3. The user selects the one of the borrowed books.
4. The system displays all information about books.
5. The user clicks button “extend”.
6. If there are no other users who wait for the book, the system extends the deadline of the book.
7. If there is at least one user waiting for this book, the system writes into a page “You cannot extend your deadline of this book since there is at least one user who wait this book.”

3.2.1.7 Use Case: Checks book availability

Diagram:



Brief Description:

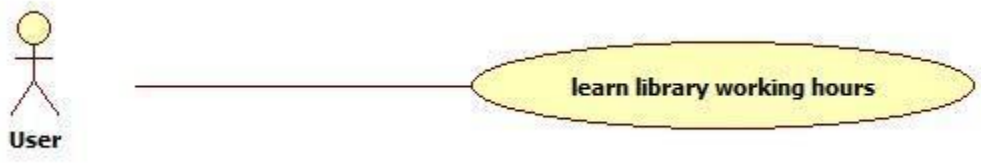
The user can check whether the desired books are available in the library or not. Before using this use case, the user should find the desired books in the library. Thus, use case “searching a book” use case should be done before this use case.

Step-by-step Descriptions

1. The user starts the application and finds a desired book.
2. The user clicks on the books and sees the availability of the book.

3.2.1.8 Use Case: Learn library working hours

Diagram:



Brief Description:

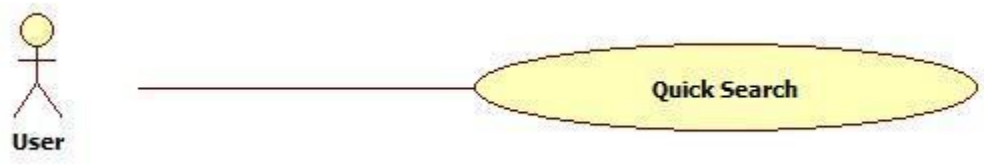
The user can see library working hours on the main page. To use this use case, the user is supposed to start the METU library application

Step-by-step Descriptions

1. The user starts the application
2. The user can see working hours at the end of the button of the main page.

3.2.1.9 Use Case: Quick search

Diagram:



Brief Description:

The user can search any books by writing only keywords about desired books. For this use case to be used, the user should start the application. The searching box is at the top of the right sides of every pages.

Step-by-step Description:

1. The user in the system clicks the empty box in which is written "*search*" and writes the keyword about the book
2. The application lists all materials in the library and displays in the new page which is same as use case "searching a book".

3.2.1.10 Use Case:"reserved a book"

Diagram:

Brief Description:

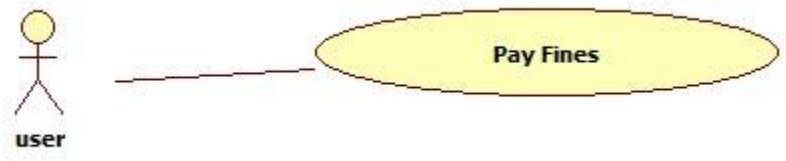
This use case provides the user to reserve a book. The user have to login into system in order to reserve a book.

Step-by-step Description:

1. The user starts the application and login into the system
2. The user search and find desired book.
3. The user clicks the reserved book.
4. If the user is in available condition(has not debt more than 5 TL, ex.) , the book is holded for the user when it comes back into the library
5. If the user is permitted to reserve a book, the system warns the user about the user's condition.

3.2.1.11 Use Case: Pay fines

Diagram:



Brief Description:

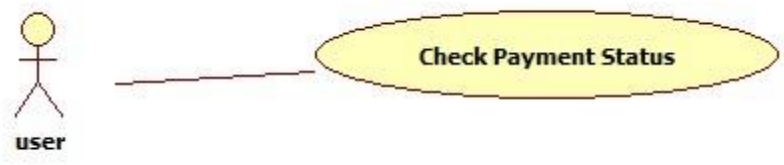
This use case provides the user to pay his or her a fines. The user have to login into system in order to pay fines

Step-by-step Description:

1. The user starts the application and login into the system
2. The user clicks the payment.
3. User will be asked security question

3.2.1.12 Use Case:"reserved a book"

Diagram:



Brief Description:

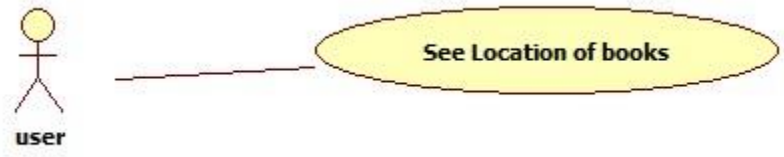
- This use case provides the user to view his or her payment. The user have to login into system in order to view payment

Step-by-step Description:

1. The user starts the application and login into the system
2. The user clicks the payment condition.

3.2.1.13 Use Case: Location of the books

Diagram:



Brief Description:

- This use case provides the user to view book's location.

Step-by-step Description:

1. The user starts the application and login into the system
2. The user search and find desired book.
3. The user clicks the show location of book.

3.2.1.14 Use Case: Request a Material

Diagram:

Brief Description:

- This use case provides the user to request book from another library. The user have to login into system in order to use this facility

Step-by-step Description:

1. The user starts the application and login into the system
2. The user search desired book.
3. İf the book is not exist in Metu's library, the user will see same boks in other library
4. The user clicks the request book.

3.2.1.15 Use Case: Borrow Materials

Diagram:

Brief Description:

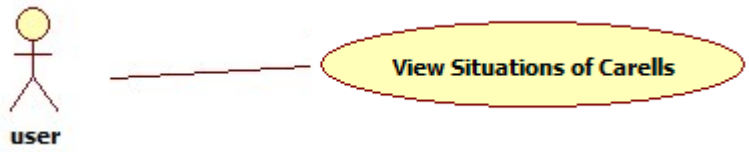
- This use case provides the user to borrow materials by using their mobile devices. The user have to login into system in order to use this facility and the material must be available for borrowing.

Step-by-step Description:

1. The user starts the application and login into the system
2. User goes to Scan menu
3. User scans the barcode of the material
4. If the book is available for borrowing, then application asks user to borrow the material
5. If book is not available for borroving (if somebody holds the material), then application returns a warning message

3.2.1.16 Use Case: View Situation of Carells

Diagram:



Brief Description:

- This use case provides the user to view the situation of the carells in the METU Library. Carells are the specials study rooms for the PHD and Graduate students in the METU Library. The user does not have to login into system in order to use this facility.

Step-by-step Description:

1. The user starts the application
2. User can be logged to the system or push the menu button without logging
3. User pushes the “Carells” button

3.3 Non-Functional Requirements

In order to run the program, ADK and any version of Eclipse shall be installed on the computer. In addition, to run Java on a computer, JDK or JVM or JRE (mentioned above) shall be installed too. Minimum system requirements for Eclipse are as follows:

3.3.1 Performance Requirements

1000 people should be able to use web application simultaneously. Our application should response user request at most in 2-seconds time.

3.3.2 Design Constraints

We will follow Object-Oriented-Programming paradigm. We will use Java on android application development. The Android version of the device that the app will run on should be 2.3 or higher. Also this application will need internet connection.

4. Data Model and Description

4.1 Data Description

4.1.1 Data Objects

account:
user_name: Name of the account taken from the user.
user_passward: Password of the account taken from the user.
user_id: ID number of the account taken from the user.
reading_history: List of the materials that user of the account borrowed up to date.

messages: Massages received from the Library.
debt: Debt of the user of the account because of late giving back borrowed materials.

material:
material Type: Types of the materials that can be borrowed in the Library. There are two types of materials; book and magazine.
barcode NO: Barcode number of the material. This property is unique for any material.
title: Title of the material.
subject: Subject terms of the material.
location: Location of the materials. Shows the book is in the main library or in the North Cyprus Library.
call_no: Call Number of the materials. This number used for the location of the book in the library.
status: Status of the materials. Shows whether the materials is available in the library or not.

book:
edition: Edition of the book.
authors: Authors of the book.
publication: Publication information of the book.
Publication_date: Publication date of the book.
language: Language that book has been written in.
isbn: ISBN number of the book.

magazine:
frequency: Publishing frequency of the magazine.
issn: ISSN of the magazine.

borrowed_material:
material: The material. This class includes the properties of the material.
borrower: The user who has borrowed the material.

due_date: Due date of the material.
number_of_renewal: Number of renews of the material. Users can renew the borrowed material at most three times.

announcement:
announcement_date: Date when the announcement is announced first.
expire_date: Date when the announcement will be unpublished.
subject: Subject of the announcement.
details: Details of the announcement.
related_web_link: Web link that is related with the announcement.
related_email_address: E-mail address that is related with the announcement.

credit_card:
card_number: Card number of the credit card.
name_surname: Name and Surname of the credit card owner.
expiring_day: Expiring date of the credit card.
cvv: CVV number of the credit card.

recommendation:
name: Name of the person who makes the recommendation.
e_mail: E-mail address of the person who maked the recommandation.
suggestion: The suggestion message.

menu:
current_menu: The menu that the user currently resides in.

search:
keyword: The keyword that is going to be searched.
search_type: The type of the search. It can be detailed search or quick search.

scan:

barcode: The barcode number of the scanned material.

barcode_type: The barcode type of the scanned material. Two different barcode type is used on the materials in METU Library; Code 32 and Code 128.

user: User who is going to borrow the material.

4.1.2. Relationships and Complete Data Model

In the MOBILE Library Project, all the processes are done by the menu class. Different classes communicate by the menu class and all functions are called by the menu class.

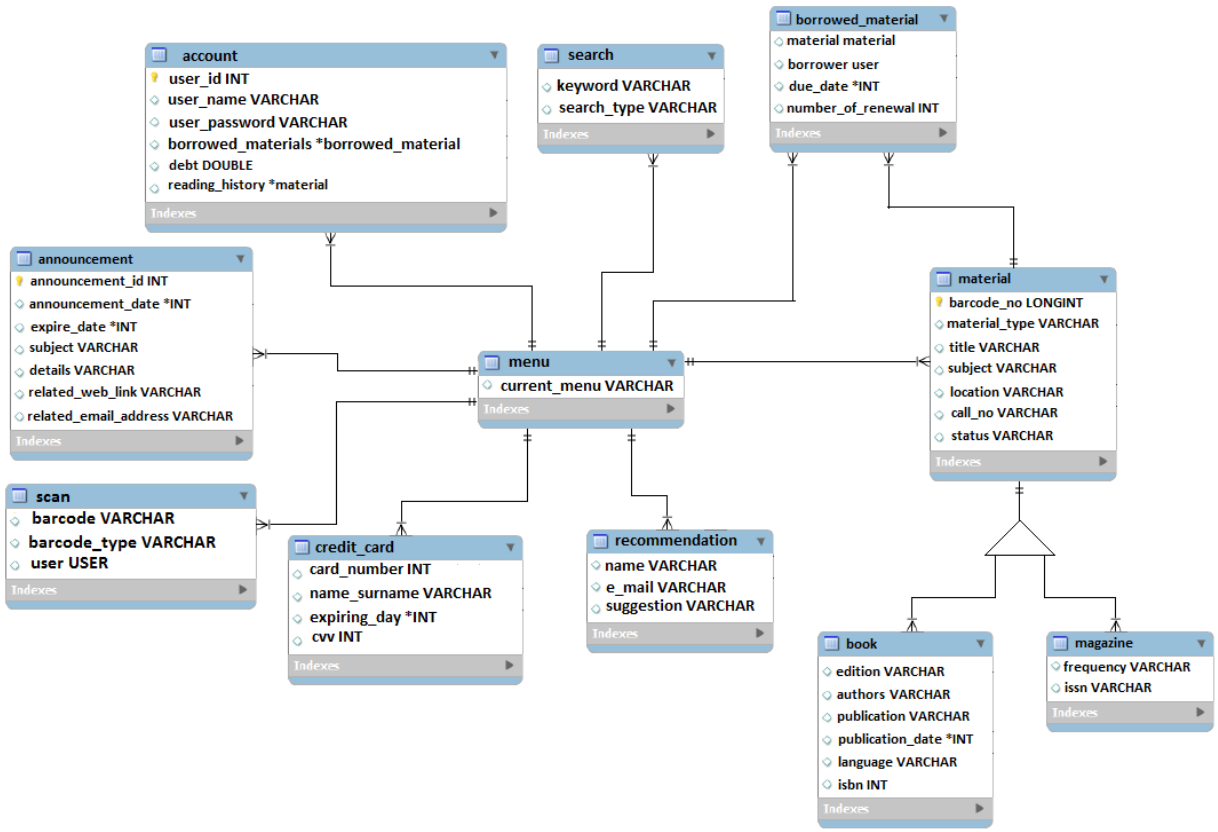


Figure 5 – ER Diagram

5. Planning

5.1 Team Structure

Our team, HebeleGubeleGom, consists of four students. Upol RYSKULOVA (1750280), Hacı Ali ŞAHİN (1720062), Yunus Emre AVCI (1885433) and Ali Çınar (1746569).

5.2 Estimation (Basic Schedule)

Up to the end of the first semester, we are planning to make the basic facilities like login, search, location, scan, carell, announcements, hold and recommendation available on the local database. In the second semester we are planning to complete the other facilities and run the application on the real database.

Here is the deadlines of the reports according to the CENG491 syllabus;

Project (SRS) 30 October 2013
Project (DR) 30 December 2013
Prototype Demo 27 January 2014
Project (STD): Second Semester
Project (STR): Second Semester

5.3 Process Model

Since it is easy to apply the changes on the project, we are using the waterfall process model. In general, this model may be considered as having six different phases:

1. Requirements Analysis
2. Design
3. Implementation
4. Testing
5. Installation
6. Maintenance

The waterfall model proceeds from one phase to the next in a sequential manner. Thus the waterfall model maintains that one should move to a phase only when its preceding phase is completed and perfected.

6 Conclusion

In conclusion, in this document, we have defined how should be MobileLibrary Project in detail. These are the first plans about the project and when we are implementing the project, some minor details may change or added. These changings will be shown in the update documents.