



— CSUSB — LIBRARY STUDY SPACE

CSUSB LIBRARY STUDY SPACE
MOBILE APPLICATION

SOFTWARE REQUIREMENTS SPECIFICATION

Revision 2.0
March 22, 2015

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1 Introduction

1.1 Purpose

This software requirements specification is intended to provide a complete and working description of the CSUSB Library Study Space mobile application. It contains both the functions of the software to be made as well as detailed, specific requirements. The clients for this mobile application are Dr. Laurie Smith, and Dr. Samuel Sudhakar, V.P. of Information Technology Services. This document will be done as part of the requirement for CSE 455 (Software Engineering) under Dr. Conception.

1.2 Scope of the Project

The software to be developed will be a mobile application for usage by the students of California State University, San Bernardino (CSUSB). The application will be designed with the main goal of allowing students to reserve a group study room, multimedia collaboration room, or an individual study carrel within Pfau Library. The application will be implemented on Android 4.0+ devices.

The application will include a number of tools to assist in reserving various study rooms and carrels, information that is currently only available at

lib.csusb.edu/services/reserveStudy.html

as well as a map and detailed descriptions of the various group study rooms within Pfau Library.

In the first iteration, the application will allow users to reserve mock rooms without interacting with the CSUSB servers. This iteration will focus on front-end, offline implementation and is meant to give the client a taste of what the app will work and feel like.

In the second iteration, the application will interact with the CSUSB servers, retrieve data from the CSUSB Library Website, and allow users to actually reserve rooms. This iteration will focus on back-end, online implementation and adjusting to the client's feedback from the first iteration.

1.3 Definitions, Acronyms, and Abbreviations

Android

A Linux-based operating system designed primarily for touchscreen mobile devices such as smartphones and tablet computers.

Android Studio

An IDE created by Google that allows the easy creation of Android applications.

Client

CSUSB Pfau Library.

HTML Hyper Text Markup Language

The dominant description language for the front-end display of web pages.

JavaScript

A programming language that allows execution of application logic by the web browser.

MB Megabyte

A unit of memory, equivalent to roughly 1 million bytes.

MySQL DB My Server Query Language Database

A database engine and language developed by Oracle Corporation for storing various types of data.

OkHttp

A Java framework that enables quick interaction with websites.

QA Quality Assurance

The team responsible for verifying that the application produced by the software team meets its requirements.

RAM Random Access Memory

A type of computer memory used for fast access during program usage.

SDK Software Development Kit

An environment designed for the purpose of developing a specific type of application, containing tools and code libraries that facilitate development.

TCP/IP Internet Protocol Suite

A standard networking protocol for end-to-end connectivity. Requires some overhead.

User

A CSUSB student.

Webkit

A software layout engine designed to allow web browsers to render pages in accordance with the HTML5 specification.

1.4 References

IEEE Std 830-1998 Software Requirements Specification
Student Advising SRS 1.0 (Iteration #1)

UML Distilled: A Brief Guide To The Standard Object Modeling Language (3rd Edition) by
Fowler, Martin

1.5 Overview

The rest of the document is organized into two sections. The second section provides an overall description of the mobile application. This includes its interfaces, accessibility, usability requirements, user characteristics, constraints, and dependencies. The final third section contains detailed requirements regarding the actual user interfaces of the mobile application.

2 Overall Description

2.1 Product Perspectives

The following features and characteristics will be present in the first prototype of the application (due February 27, 2015):

- Clientside (offline) ability to reserve one of the three study room types (group study room, individual study carrel, multimedia collaboration room)
- Calendar to select date
- Ability to select up to two hours of reservation in one day
- Display “Conditions of Use”
- Display “Booking Details”
- Mockup confirmation email prompt

Additionally, the second prototype will include the following features and characteristics (due March 23, 2015):

- Full online interaction with the CSUSB Library database and application server

- Map of the library study rooms
- Display library study room information (from CSUSB website)
- Help/Guide for users
- Hotlink to CSUSB website (open in native browser)

2.1.1 System interfaces (deployment diagram)

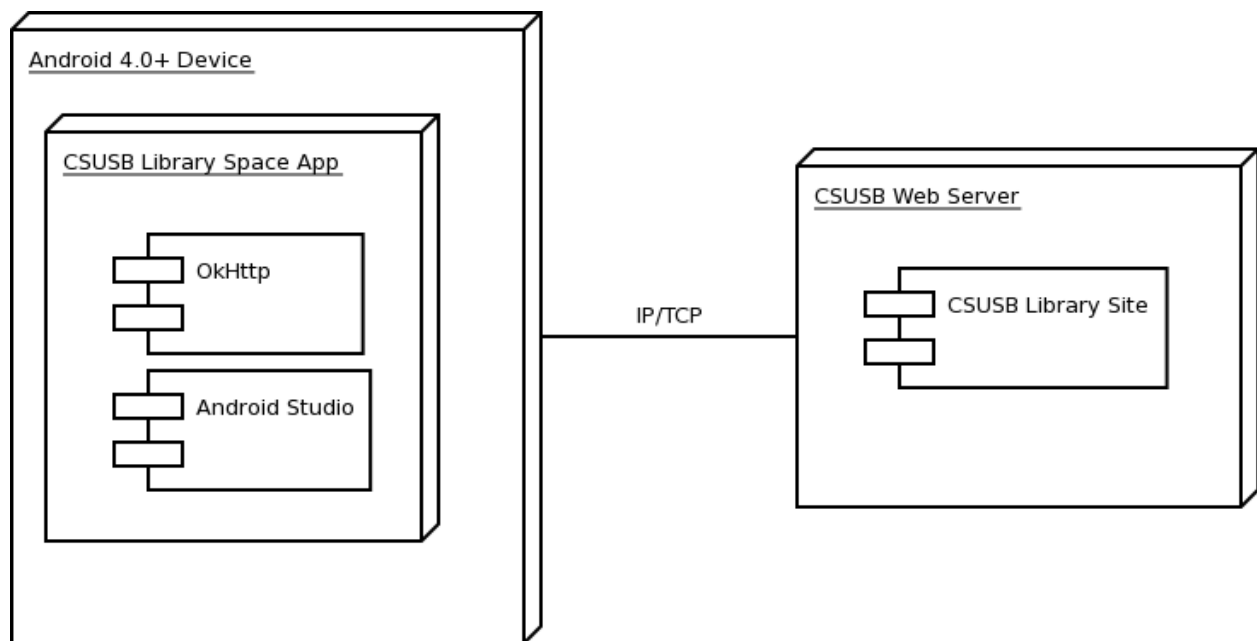


Figure 1: CSUSB Library Study Space App Deployment Diagram

The mobile application will handle most of its logic within the application using native Android. The application will be built with the aid of Android Studio. Network access will be handled by OkHttp, which will enable interaction with the CSUSB Library Site.

2.1.2 User interfaces

Upon opening the app, a splash screen will appear briefly and bring the user to the main menu of the application. The user interacts and navigates through the app via touching buttons and filling out any necessary forms.

Home Screen- This is the home screen of the app. The CSUSB student will be able to choose which room they want to reserve (Group Study Room, Individual Carrel, or Multimedia Collaboration Room).

Group Study Room Screen- This is the screen the CSUSB student will see if reserving for groups of three or more. There will be a calender on this screen, with which the student can select the day they want (up to 7 days from the initial day). The student will then be able to see the availability of the group study room based on the day they selected and choose an hour(s) that suits them. There will be a button that displays information about the rooms. There will be a link to a PDF file to see the location of group study rooms.

Individual Carrel Screen- This is the screen the CSUSB student will see if reserving a study carrel for one student. There will be a calender on this screen, with which the student can select the day they want (up to 7 days from the initial day). The student will then be able to see the availability of the study carrel based on the day they selected and choose an hour(s) that suits them. There will be a button that displays information about the carrels. There will be a link to a PDF file to see the location of the study carrels.

Multimedia Collaboration Room Screen- This is the screen the CSUSB student will see if reserving for groups of one to four. There will be a calender on this screen, with which the student can select the day they want (up to 7 days from the initial day). The student will then be able to see the availability of the multimedia room based on the day they selected and choose an hour(s) that suits them. There will be a button that displays information about the rooms. There will be a link to a PDF file to see the location of multimedia rooms.

Condition of Use Screen- This is where the student will have to read the conditions of reserving one of the library rooms. The Condition of Use is similar to the current Conditions of Use on the CSUSB Library Website, which goes over library policies and other details. The condition of use screen will vary slightly depending on which of the three reservations the student choose.

Booking Details Screen- In this screen the student will enter reservation information. Full name and email will be a required field in the form while “public booking label” will be an optional field. This screen will be the same for all booking types. Upon clicking the submit button, the student will be prompted to check their email for a confirmation email.

2.1.3 Communication interfaces

There are four primary communications that are necessary to the proper functioning of the application.

Mobile Application to CSUSB Library Server

- URI parse to http://www.lib.csusb.edu/documents/floorMaps/group_study.pdf
- URI link to <http://www.csusb.edu/>
- HTTP POST to http://csusb.libcal.com/process_roombookings.php

- HTTP POST to <http://csusb.libcal.com/booking/>

2.1.4 Memory

The following memory constraints are in place to improve performance and ease of download.

- The application will not use more than 20MB of disk space.
- The application will not exceed 80MB of RAM.

2.2 Use Cases

The following diagram is a complete description of the application use cases.

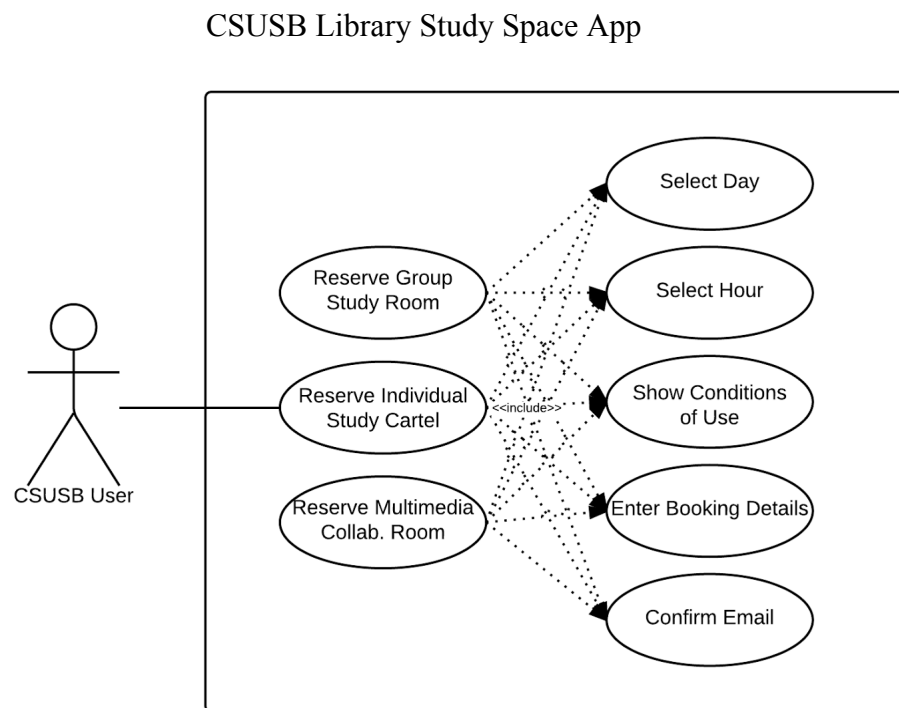


Figure 2: CSUSB Library Study Space App Use Case Diagram

2.3 User Characteristics

The target user for this application is a CSUSB student. The CSUSB student in question should be able to read basic English and visually interact with a basic graphical user interface. They

must also be a current student in the University and have a valid university email with access to said email. The user should have a functional touch keyboard on their smartphone mobile device and be familiar with basic touch capabilities as seen in most modern apps.

2.4 Constraints

2.4.1 Operating Systems

The application requires a mobile device or a tablet. Supported devices must have Android 4.0+ for an operating system.

The user should have about 20MB in their system memory for the application.

2.4.2 Connections

The application requires high-speed Internet, either by cellular data or through wifi.

2.4.3 Platforms

This application will be written in native Java using two tools: Android Studio and OkHttp. These tools will ensure quick and high-quality deployment on the Android platform.

2.4.4 Content Creation

Data input will consist of entering the user's current valid university email and confirming their desired reservation day and hour via email. All other data will be fetched via a database server.

2.4.5 Accessibility

The application shall conform to all necessary guidelines for optimal accessibility for users on mobile devices as outlined in the W3C Mobile Accessibility:

<http://www.w3.org/WAI/mobile/>

2.5 Assumptions and Dependencies

The application will require the use of the current Android platform (4.0+), HTTP, and Java.

3.1 External Interface Requirements

3.2 User Interface

The following is an initial UI mockup done by our artist Deanna Sulli:

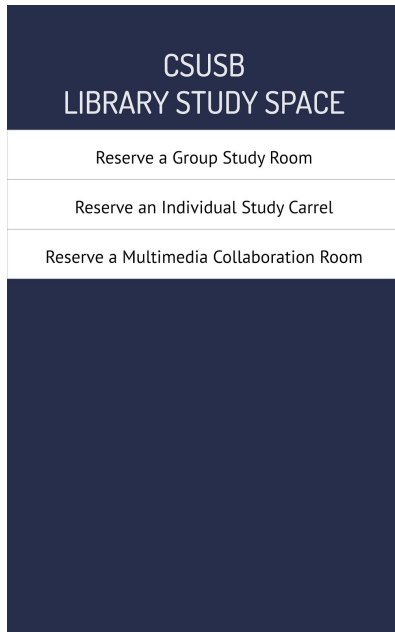


Figure 1: Home Screen

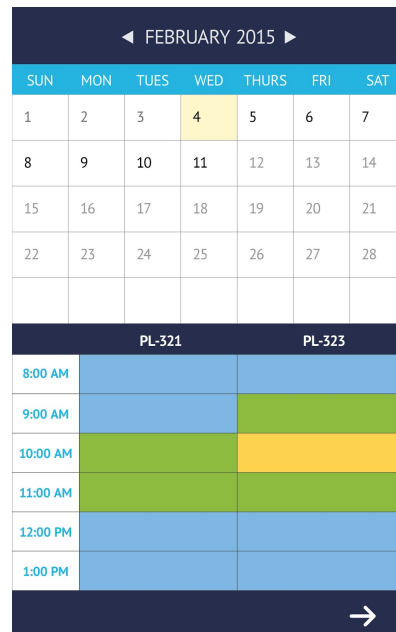


Figure 2: Calendar availability

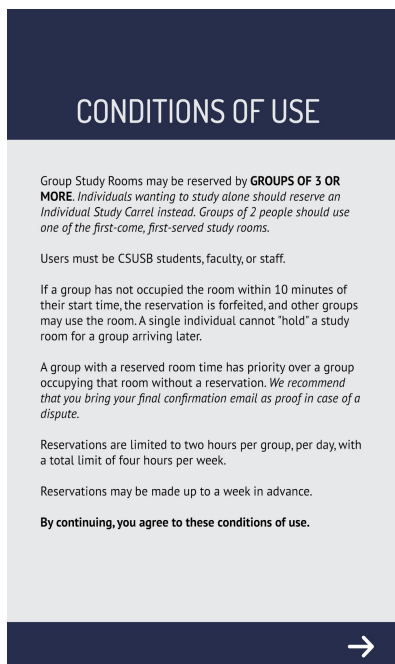


Figure 3: Condition of Use

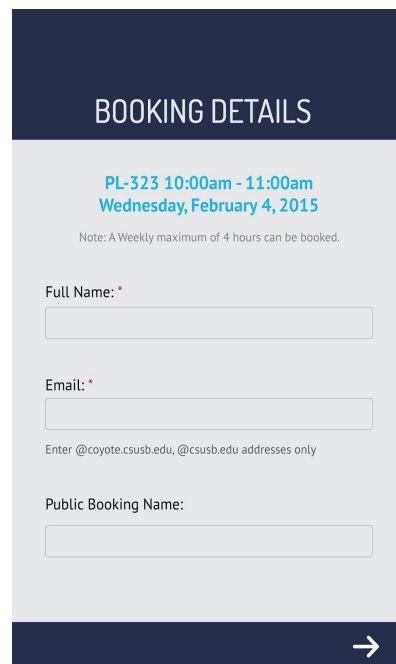


Figure 4: Booking Detail

3.3 Hardware Interfaces

An Android 4.0+ compatible device and stable internet connection will be required to run the application.

3.4 Functional Requirements

The following functional requirements will be added to the application:

1. Show type of room available
 - Description of room
2. Reserve a room
 - A simple process similar to the CSUSB website method
 - A. Select day
 - B. Select hour
 - C. Conditions of Use
 - D. Booking details (enter name, email, and booking details)
 - E. Email confirmation
3. Calendar to select reservation date
 - Selection of available days up to one week from current day
 - Available hours for specific dates
4. *Show status of booking confirmation
 - An easy to access summary of the user's booking
 - Show date, time, and location of reserved room
 - Request to cancel booking
5. Download map of group study rooms
 - From the CSUSB Library website (a .pdf)
6. *Help/Guide for new users
7. Link to CSUSB library website
 - For convenience and quick access

*NOTE: Functions marked with a * are not guaranteed to be implemented by the end of the quarter.*

3.5 Performance Requirements

The application will startup within 5 seconds on all devices.

Response time for application functions should be within 100 milliseconds. At maximum, the response time would be 500 milliseconds. These functions include button presses, keyboard, and input.

All other CSUSB applications are around or under 20MB in size, so this application will combine high performance with low memory size.

The application will be limited by both CSUSB's network and the user's own mobile device connection.

The application will require maintenance and adjustments if Pfau Library's network structure changes.

The application will be intuitive and easy to use. At no point should the user be confused when using the application.

The application will have smooth transitions between screens. The user should always know where they are within the application.

The user interface will be minimalistic and only display relevant information according to the user's needs. The user should be able to accomplish their goal in the shortest amount of time and not be bombarded by useless information.

3.6 Design Constraints

Graphics will be designed to scale for different sized phone and tablet devices to keep the user experience consistent across various devices.

3.7 Security Requirements

Several measures will be taken to prevent user information compromise.

Cookies

All cookies sent to the user will be encrypted.

Cross Site Scripting

All output data will run through HTML and JavaScript filters.

HTTP POST

Code that works with the database will be validated through prepared statements before it can be released to the database.

Code Review

The application will be thoroughly examined by a QA team with the hopes of finding any bugs or vulnerabilities.

CSUSB Email Authentication

The application will only allow valid school emails to reserve rooms.