CECS 491A - Sec 6 - Technical Specifications Document

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1 Project

1.1 Overview

This application is a type of campus companion that provides useful information and assistance to both new and current students at California State University Long Beach(CSULB). The application's primary function will be to display locations, provide foot traffic updates, integrate student schedules into their accounts for the application, and increase student productivity while on campus through a variety of features.

1.2 Objective

The final vision for the application will be to have a map of campus capable of displaying and locating all buildings, shops, and restaurants to all university campuses in the state of California. Furthermore, the application will be able to integrate student schedules and display traffic flow for all campuses based on the university. The application will make it easier for students to navigate campus and increase their productivity on campus while still making it an interactive and enjoyable application to use on a semi-regular basis through convenience, incentives, and usability.

1.3 Business Case

This application is geared towards the many students that enroll into CSULB, and have difficulties trying to navigate campus due to it being their first time or just not having much experience being in CSULB. The majority of the building layouts will be based on already available maps of the campus. The layouts for the on campus vendors will have to be scouted for due to those being changed out alot more frequently, and not being mandatory to be displayed on available campus maps.

2 Technical Specifications

2.1 Project Development Software

- Visual Studio 2019 - Community Edition (Ver. 16.11)
  - Code editor used to compile and build the majority of our code
  - Has lots of built in support for approved language on the technology stack such as C#
  - Robust application that supports many different languages and allows for agility in decision making of technologies to use

- ➢ Supports many different features for debugging and testing application code
- ➢ Industry supported application that the team has experience with and beneficial skills will be utilized after the project is completed
- ➢ Microsoft application that has capabilities of connecting to approved frameworks such as .NET as well as other microsoft applications

❖ IIS 10+
- ➢ Web Server used to easily manage and reliably host our web applications.
- ➢ Supports and has compatibility with C#.
- ➢ Microsoft supported web server which has compatibility with .net and supports many different security features and authentication mechanics
- ➢ User friendly interface that is helpful for development team inexperienced in using web servers

❖ SQL Server Express 2019 (Ver. 15.0. 2000.5)
- ➢ Database server used as a software product to store and retrieve data requested by other software applications.
- ➢ Microsoft compatibility and being able to support SQL Common Language Runtime.
- ➢ Team members are familiar with SQL and how to interact with data within databases.

❖ React.js (Ver. 16.X)
- ➢ JavaScript library that develops front-end systems and user interfaces for applications.
- ➢ Code is compatible with iOS and Android devices.
- ➢ Features and libraries are more aligned to the specifications of the application.

❖ MSTest (Ver. 2.2.8)
- ➢ Back-end testing that looks to see if there are any software defects within the application.
- ➢ Parallel test execution at the method and class level.

❖ Selenium (Ver. 4.0 RC1)
- ➢ Free and open source automated testing for web applications.
- ➢ Supports JavaScript and C#.
- ➢ Supports parallel execution on different devices and browsers.

❖ .NET Framework (Ver. 4.5)
- ➢ Cross-platform implementation that allows for services and/or applications to be run on Linux, Windows, or Apple devices.
- ➢ Easy maintenance and uses objects throughout the framework.

❖ Azure (Ver. 2021-02-12)
- ➢ Deploy a networking infrastructure over a global network.
- ➢ Secure private connections.
- ➢ Constant performance check of resources.

2.2 Workflow Software

- GitHub (Desktop Ver. 2.9.3+)
  - Web-based application that we are using to collaboratively display our code and other important documents within a repository.
  - Selected based on the client's request for deliverables to be shown on this application.
  - Allows for software team to develop code and or documents with reduced conflicts because of version control system
  - Industry standard application used widely by the team before the project and a good skill set to obtain moving forward
- Draw.io (Ver. 15.3.8)
  - Collaborative web-based application we are using to build diagrams for our designs.
  - Provides functions that allow easy creation of diagrams and models that demonstrate relations between certain aspects of the application.
  - Has built in features to support the creation of UML diagrams and includes an accompanying interface that the team has experience utilizing
  - Supported by google and compatible with sharing features and group editing capabilities.
- Google Docs (Ver. 1.21. 382.02. 30)
  - Collaborative web-based application that we are using to create our documents for the development and drafting of the project.
  - Was used as a way for team members to interact and edit documents that other team members were working on.
  - All team members were familiar with Google Docs prior to beginning the project, and found it easier to use among one another compared to new software.
  - Easy-to-understand interface makes it feasible for all members to utilize the many functions that Google Docs provides.
- Google Sheets
  - Collaborative web-based application that was used to organize data. Also used data to create charts and graphs that present visual information.
  - Part of google applications suite that are all compatible under pre existing google accounts which all team members had prior to start of project

- Discord (Ver. 10.0.19043)
  - Web-based application to easily communicate with each other as well as for meetings and discussions.
  - All team members have a lot of experience with Discord which makes it easier for team members to communicate with one another.

- ➢ Screen sharing features and group call features allow for team members to have an easier time in conveying information and sharing thoughts (from a visual and auditory point of view).

2.3 Programming Languages

- ❖ SQL
  - ➢ Main language we are using in order to create our databases since this language allows us to also handle any information we enter into these databases using tables, as well as being able to query these tables.
  - ➢ All team members have experience utilizing this language to manipulate and access databases
- ❖ C# (Ver. 9.0)
  - ➢ The language in which the majority of our web application will be written in due to the fact that it works well with Visual Studio 2019.
  - ➢ For its high scaling capability and for its faster development time compared to other coding languages.
  - ➢ Offers attractive features for smooth development

2.4 Team Hardware

- ❖ Desktop/Laptop
  - ➢ Interfaces our team uses in order to work on the project using the latest versions of both Windows 10+ and MacOS Big Sur 11.5.2+.
  - ➢ Hardware Requirements:
    - ■ CPU: 1 virtual CPU
    - ■ RAM: 2 GB
    - ■ Storage: 40 GB
    - ■ DBMS:

3 Technology Constraints

3.1 Constraints

- ❖ Viewing Constraint: We'll need to consider how to make our map feature as easy as possible for someone as they tap and swipe through while commuting throughout campus. Simplifying navigation to help our users accomplish their personal or professional goals faster.

- ❖ Performance/Speed: Due to the amount of content our application will hold, we need to be able to build a robust application to ensure performance. We also need to make sure to be able to scale our application rapidly for any possible periodic surges in traffic. This kind of planning for the future will ensure our initial app launch can deliver the kind of speed and performance we want for early, often-critical, users.
- ❖ Web Security: Implement the proper security measures for our application. SSL certificates are a global standard security technology that enables encrypted communication between the browser and server. When integrated, enhance security and eliminate the chance of being flagged as unsecure by web browsers.

3 Document Tracking

Version	Date	Description
1.0	09/28/21	Transcribed Template
1.1	10/01/21	Initial Drafting
1.2	10/06/21	Milestone 1 Deliverable