Design Document

Interactive Map of IT Carlow

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Date: 18/12/2020
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Abstract

The purpose of this project is to develop a mobile app for Android that will allow users to find the way to their classroom on campus of IT Carlow. This app will help guests, students and professors to find a room on campus. The user is able to choose between points on the map as the starting point or use the GPS function of their device. The app will have a function to calculate the path from the starting point to the end point. Users can create a profile. This allows them to create a schedule. This feature will push notifications to the device 5 minutes before the event(i.e. lecture) and when the user clicks on the notification it will calculate the path to the classroom and display it to the user.

1. Introduction

This document will describe the design of Interactive Map of IT Carlow project. The document will provide better understanding of design requirements needed to meet the functional specifications of this project. Design document uses information that has been laid out in the research document to lay out technologies that this project will be developed with, including User Interface prototypes.

The following sections will cover different aspects of the project. In the technology section the focus will be on the chosen technologies from the research document which is React Native, Firebase and Google Cloud Storage.

The next section will contain database layout. Class Diagram and Sequence Diagram sections will detail different classes in the system and how they interact with each other.

The last section is UI prototypes which will contain screens that will show main functionality of the app.

2. Technology

2.1. React Native

React Native is a JavaScript based programming language. It allows for development on both Android and iOS devices with a single code base. Final product is therefore able to be published on Android and iOS.

This project will be using a development environment called Expo. Expo allows developers to instantly view changes made to the code on emulators, via USB debugging and via Expo App. Expo is able to manage libraries, structure the code and publish the project. It allows switching between development and production versions of the app.

This project will be also using Node.js and NPM to incorporate any libraries used in the project. There are many NPM libraries built by the community and some are beneficial to this project. Below are some libraries that will be used:

React-native-maps: Provides Map components such as markers, polygons etc. on the map.

React-native-geolocation: This library provides tools to track location data such as longitude, altitude, distance and heading. It watches the position of user and returns a position array when the user's location changes.

React-native-dotenv: This library allows developers to store API keys and other sensitive information in a .env file where they are not exposed to the public.
React-native-navigation: This library provides managing presentation and transition between different screens in the app.

React-native-firebase: This library allows developers to connect to the Firebase SDK.

React-Native-Navigation: This library allows developers to navigate from one screen to another within the app as well as send information between screens.

React-Native-Size-Matters: This library allows developers to scale parts of the UI so that the same sizes of elements can be used on different sized screens.

React-Native-SVG: This allows developers to draw different shapes on the screen. This will be used to draw a path on the image.

React-Native-Image-Pan-Zoom: This allows developers to make it possible for users to zoom in on the image.

2.2. Firebase

This project will be using Firebase's realtime database functionality. Using npm library to communicate between React Native and Firebase.

2.3. Google Cloud Storage

Google Cloud Storage allows developers to store images in a "storage bucket". This functionality will be used to store the maps that are used for the app. This will be accomplished with the same library as is used for Firebase Database.

3. Database

USERS [

<UID>

-Email
-Name
-Course
-Year
-Password
-Schedule [
-Class
-Building
-Room
-Time
]

]

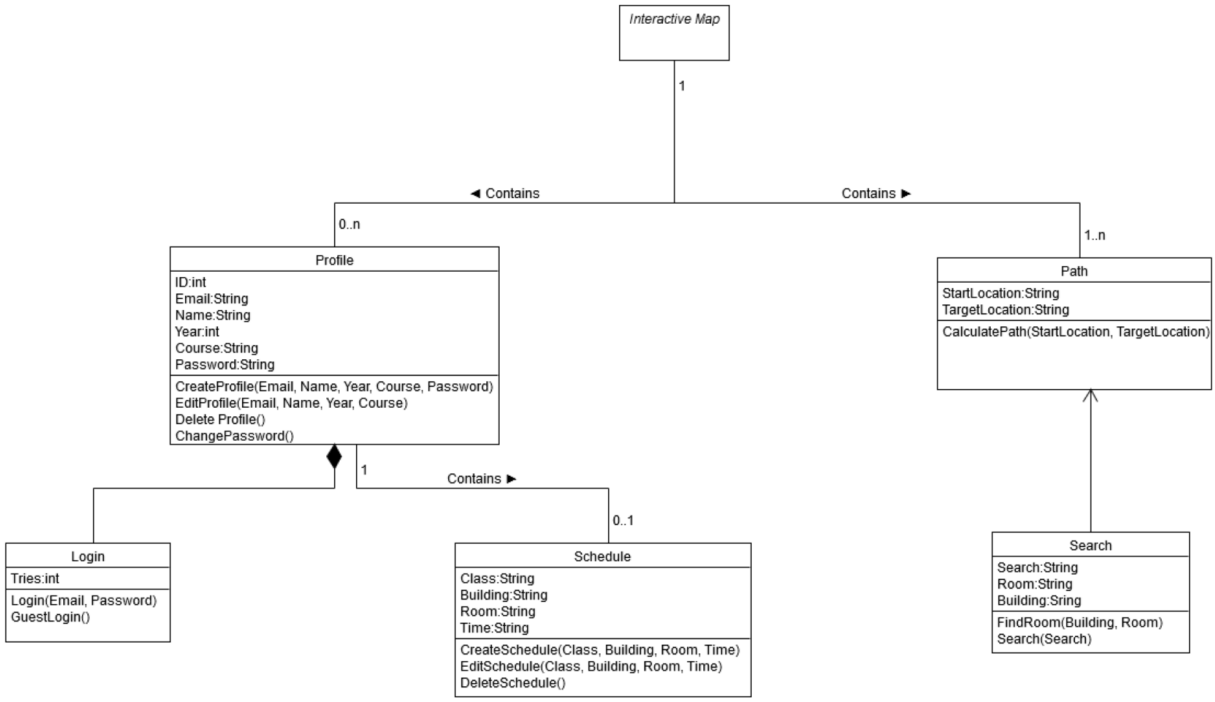
MAPS [

<MID>

-Building [
-Rooms
]
-Path
-No.of Buildings

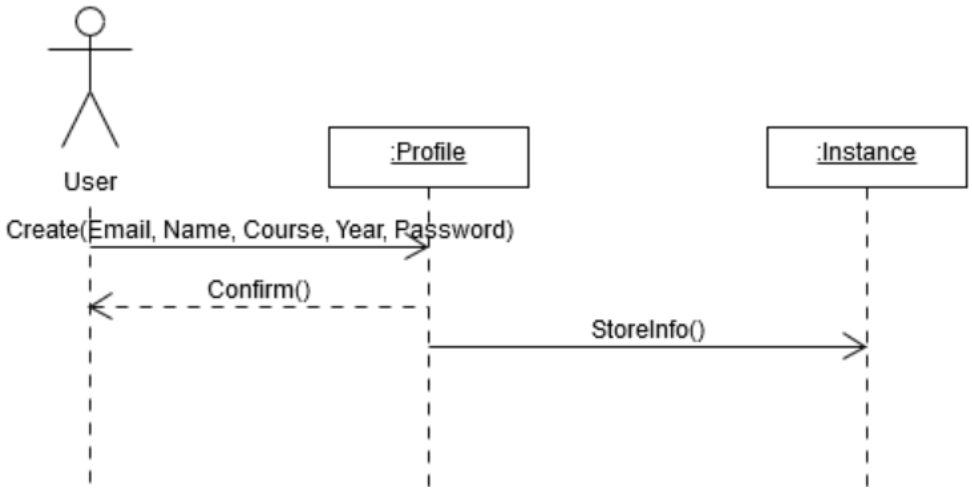
]

4. Class Diagram

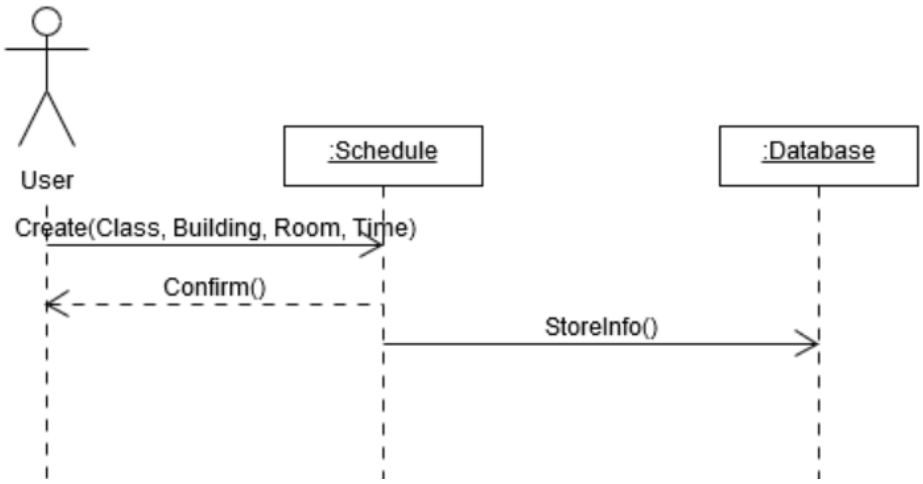


5. Sequence Diagram

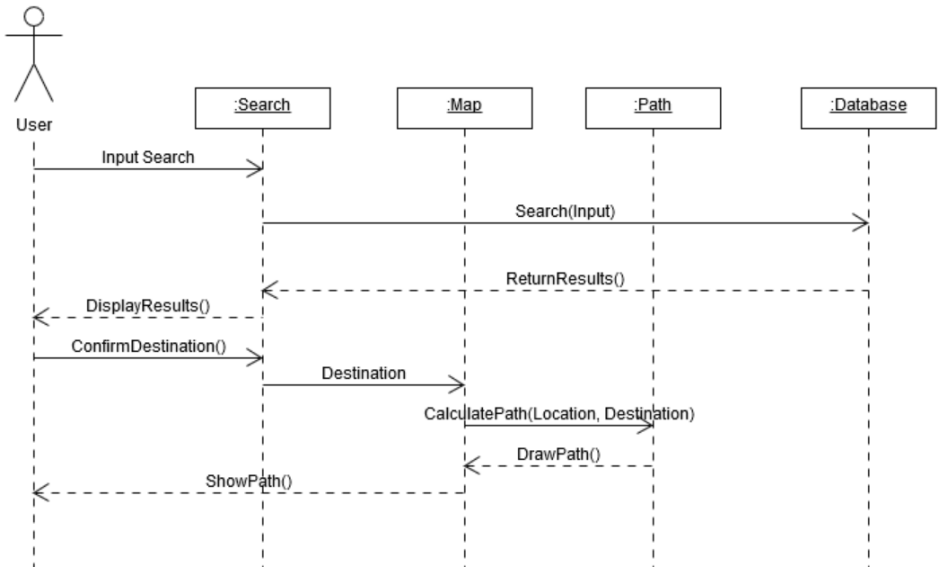
5.1. Create Account



5.2. Create Schedule



5.3. Navigation



6. UI Design Prototypes

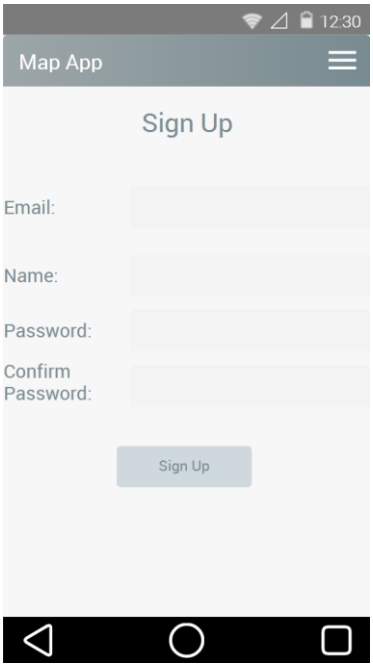


Fig. 1: Sign Up Screen

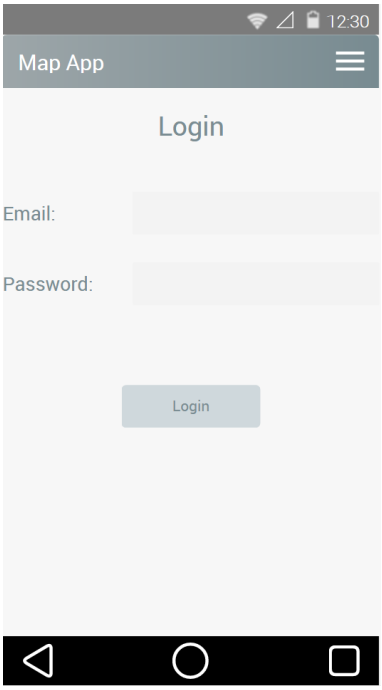


Fig. 2: Login Screen

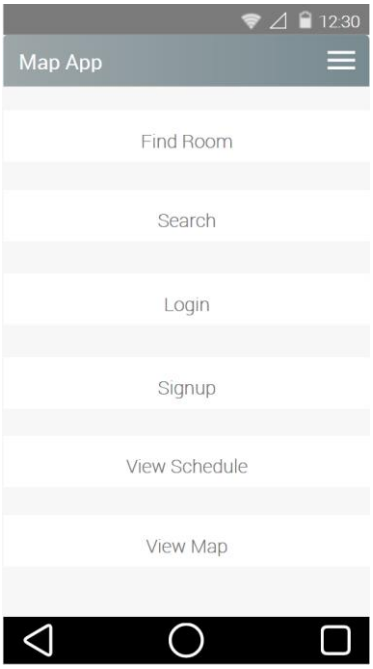


Fig. 3: Home Screen

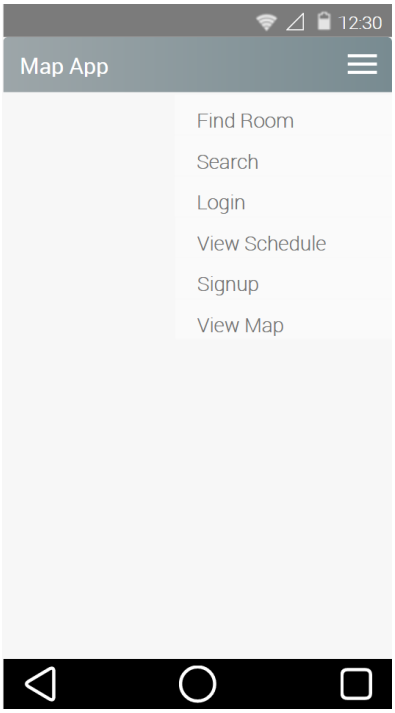


Fig. 4: Menu

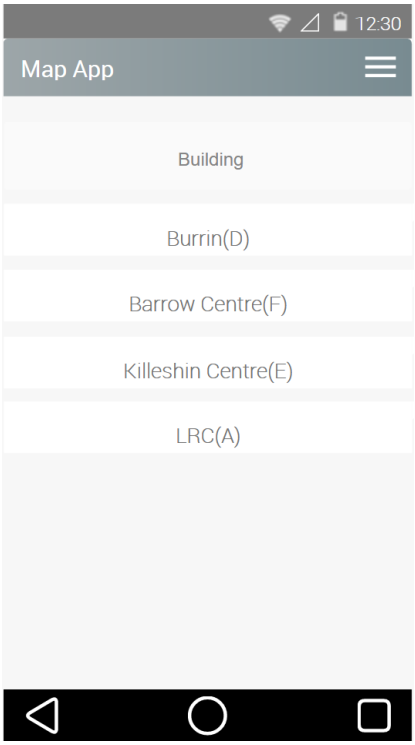


Fig.5: Choose Building Screen

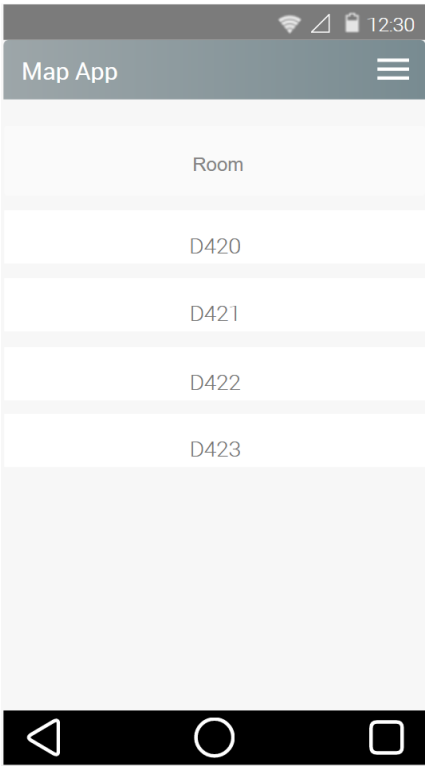


Fig. 6: Choose Room Screen

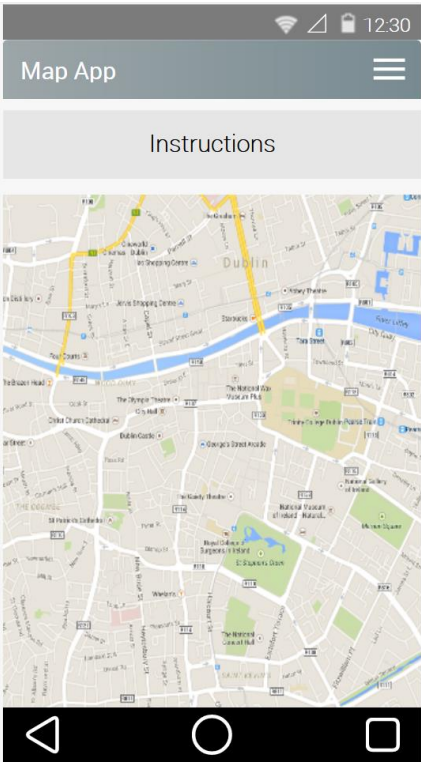


Fig. 7: Map / View Map Screen

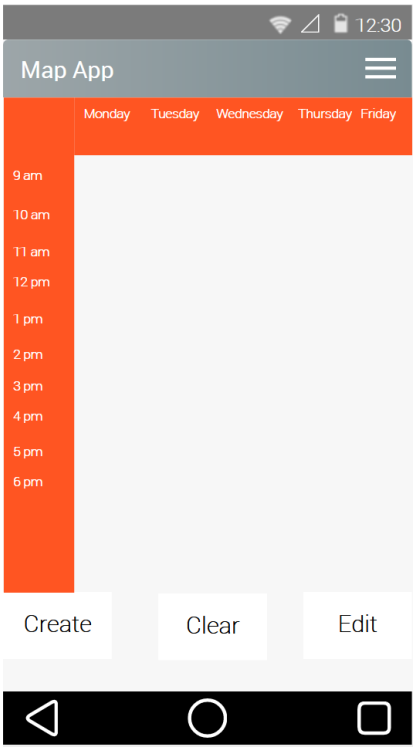


Fig. 8: View Schedule Screen

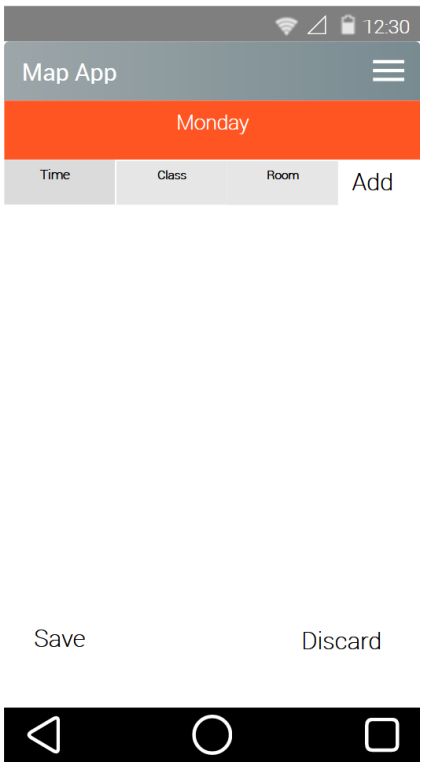


Fig. 9: Create/Edit Schedule Screen

7. Plan

The project is in its design phase after leaving the planning phase on 13th of November and its analysis phase on 27th of November. The design phase is expected to be finished on 18th of December.

The production is starting on 19th of December, right after the design phase is finished. There are 17 weeks left until the end of the project. The outline of goals for the duration of the project is as follows:

Week 1: Simple GUI creation for the app.
Week 2-3: Implementation of the maps within the app.
Week 4-8: Implementation of path calculation within the app.
Week 9-10: Implementation of the profile features as well as schedule and notifications.
Week 11-12:Implementing Search function.
Week 13: Creating final GUI for the app.
Week 14-15: Testing and debugging of the app.
Week 16: Final report and Technical Manual.

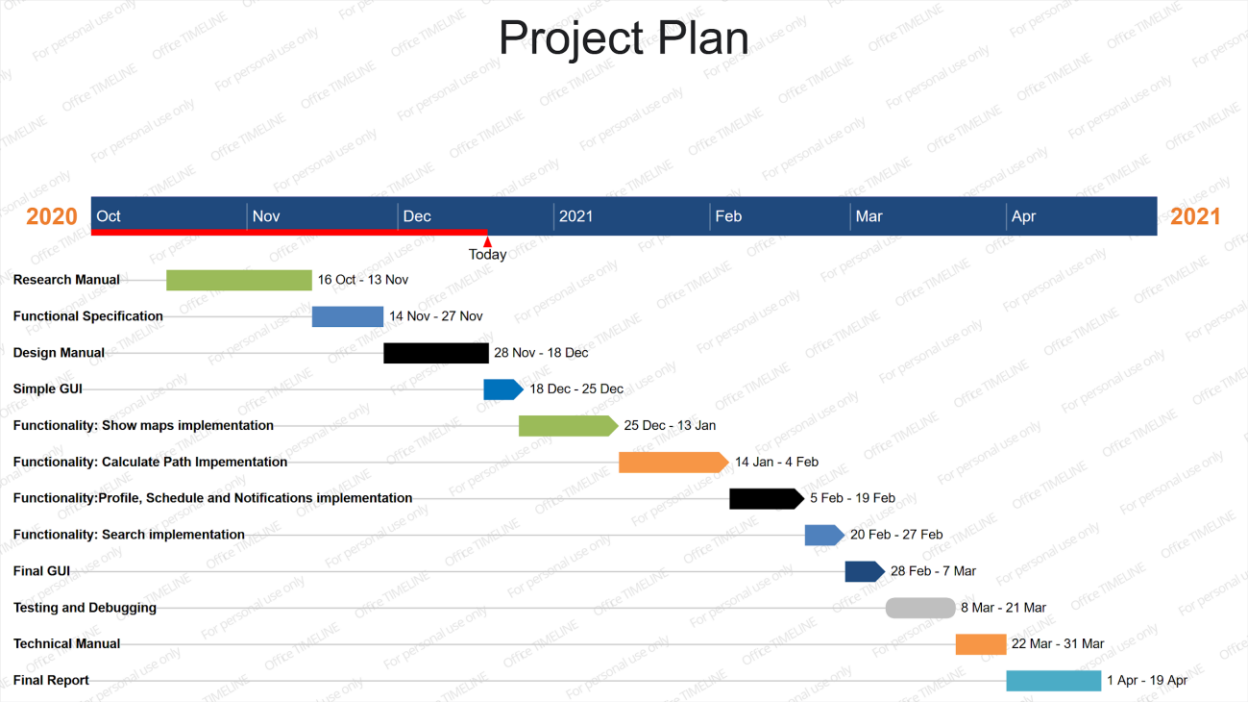


Fig. 10: Gantt Chart

8. Declaration

INSTITUTE of TECHNOLOGY CARLOW

Institiúid Teicneolaíochta Cheatharlach

Declaration

- I declare that all materials in this submission e.g. thesis/essay/project/assignment is entirely my/our own work except where duly acknowledged.
- I have cited the sources of all quotations, paraphrases, summaries of information, tables, diagrams and other material; including software and other electronic media in which intellectual property rights may reside.
- I have provided all bibliography of works and sources used in the preparation of this submission.
- I understand that failure to comply with Institute's regulations governing plagiarism constitutes a serious offense.

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Signature:

Date: 18/12/2020