

UQU Interactive Map

الخريطة التفاعلية لجامعة أم القرى

Author: Shoaib Obaidullah

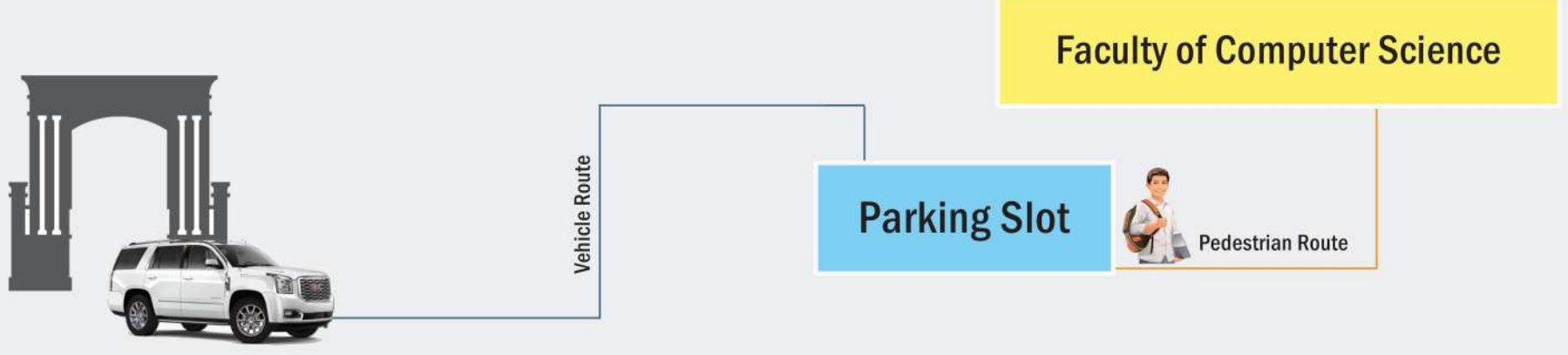
Supervisor: Dr. Khalid al Tarmissi

Introduction

Umm al Qura University is one of the largest universities in the kingdom of Saudi Arabia having the largest number of students. The university is located in a suburb area of the Mecca city-about 10 km away from the residential areas, and because of its geographic location, most of the people are either students, professors, staff, workers, or even visitors enter into the university compound on daily basis for different purposes; like studying, teaching, working or perhaps just for a tour, and they all get into the university using vehicles. So, because of the wide area of the university and embedding tens of faculty buildings, scientific and technical research centers, and many other facilities within the university's compound, a huge number of students and visitors cannot reach their desired locations at an appropriate time, and the problem gets double in the first few days of the university startup and that's because of freshmen students' enrollment.

In fact, these people aren't aware of the exact routes that directly lead them to the nearest parking lot to park their vehicles and then face towards their desired locations. Therefore, they either keep asking others for location help, or they spend much of their time searching for places. So, to solve this problem, I suggest building an online interactive map to help people find their destinations easily.

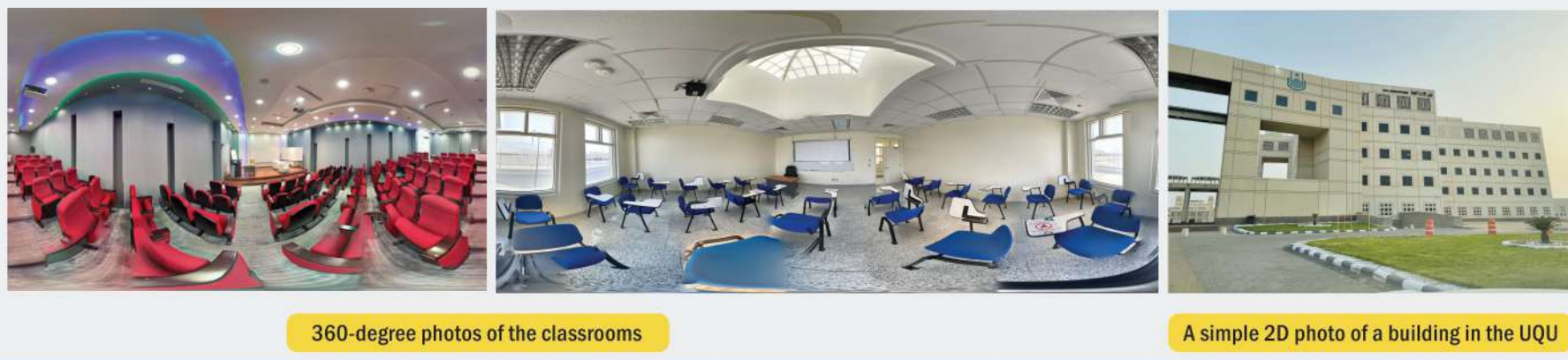
The map acts as an outdoor kind of navigation system that shows the routes for buildings based on the user's search input or selection, then relatively the system will show the exact vehicle routes to the predefined appropriate parking lot, with a pedestrian path stretching to the destination and statistical information about the building on the right side of the map as an output. Therefore, the map will not only help people to not navigate wondering, but it will help the university authorities to hold a good balance on the distribution of people into the predefined suitable parking lots, and that will certainly prevent traffic congestion.



Objectives

The objectives of this project are:

- 1) To provide a vehicle route from all the entrance gate (Gate No 1, 2, 3 & 4) to the nearest and suitable parking slot of the desired locations entered by user.
- 2) To provide a pedestrian path from the parking slot to the exact destination of the users.
- 3) To provide a static information in the form of table about each object being clicked.
- 4) To provide chart and graph-based information about each object in the university.
- 5) To provide a 360-degree footage of the classrooms in the faculty of computer science.
- 6) The ability for users to measure the distances between objects on the map.



Entended Outcome

The intended outcomes for this system is an online web-based application.



Map Layouts



Technologies being used

GIS Tools

The following GIS tools are being used for digitization, editing spatial data, styling, storing and creating geometry based API's.

- ArcGIS Pro: For digitization
- QGIS: For editing and styling map layers
- PostgreSQL ORDBMS + PostGIS: For storing spatial data
- VSCode is used as the code writing platform.

Front-end Techs

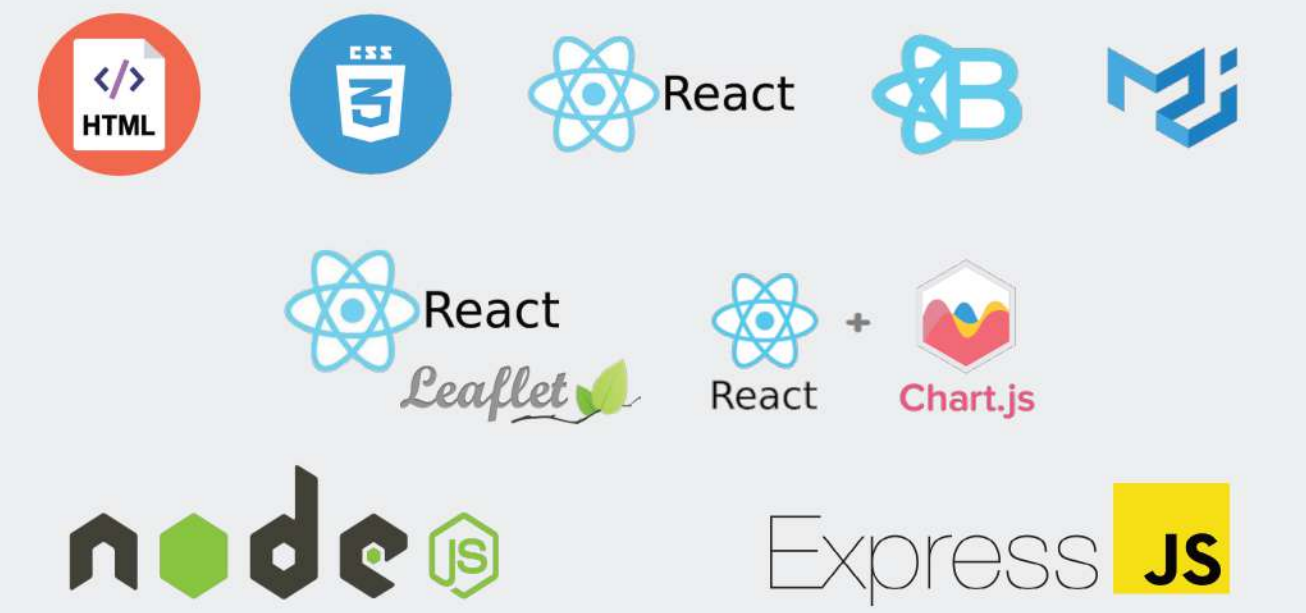
The following front-end technologies (languages) are being used:

- Hyper Text Markup Language (HTML): For creating web page layouts
- Cascading Style Sheet (CSS): For styling the HTML elements or web page layouts
- ReactJS Library / Framework: For building user interfaces
- React-Bootstrap: For styling the HTML elements.
- JavaScript Programming Language: For creating dynamic and interactive web content
- React Leaflet Mapping library: For building web mapping applications
- React Material UI: For building the UI component of the application.
- React-Chartjs-2: For importing the charts to show the statistics.
- React Reveal: A reactjs animation library for HTML elements

Back-end Techs

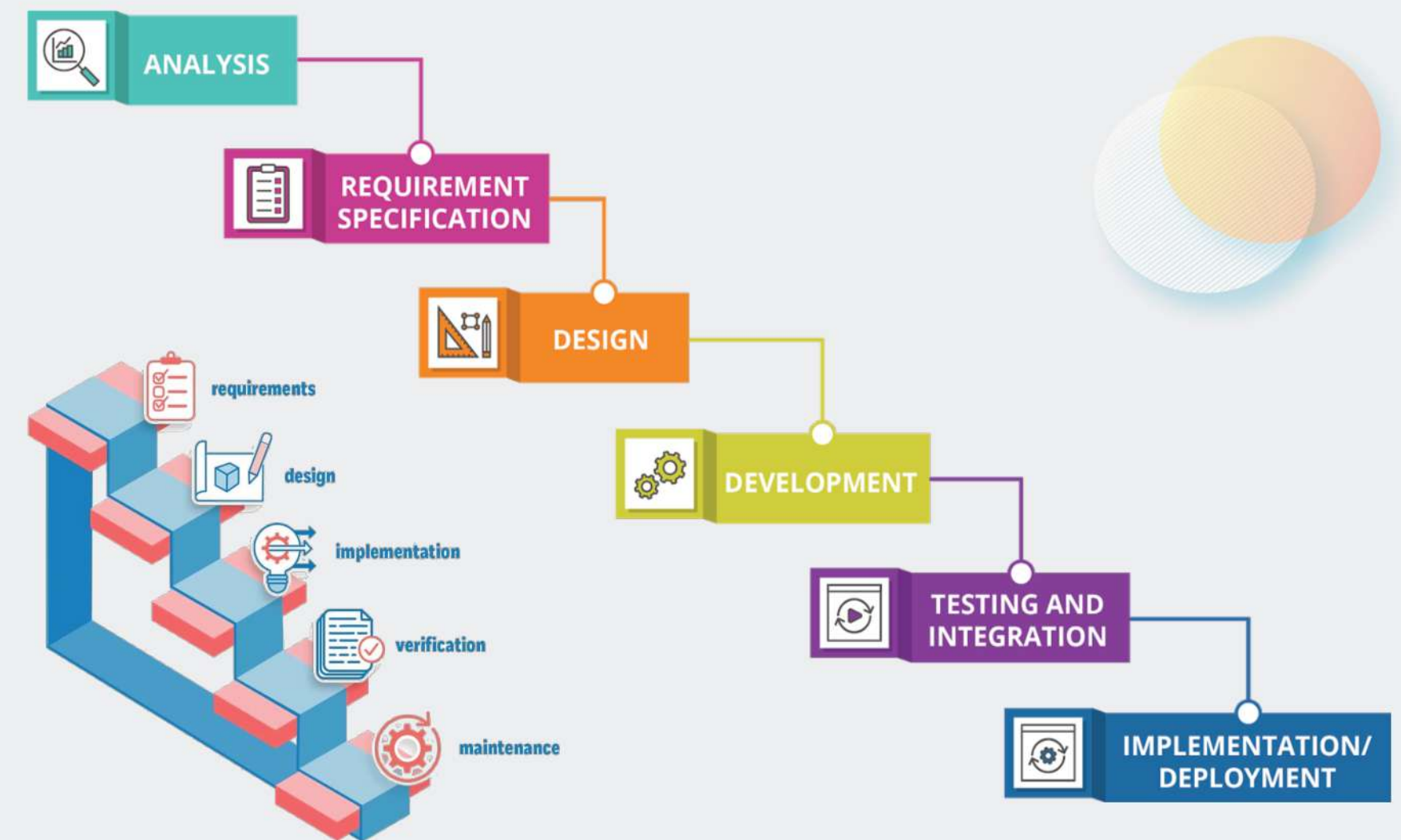
The following back-end technologies are being used:

- NodeJS: For creating back-end API services.
- ExpressJS: For handling requests from server and database.



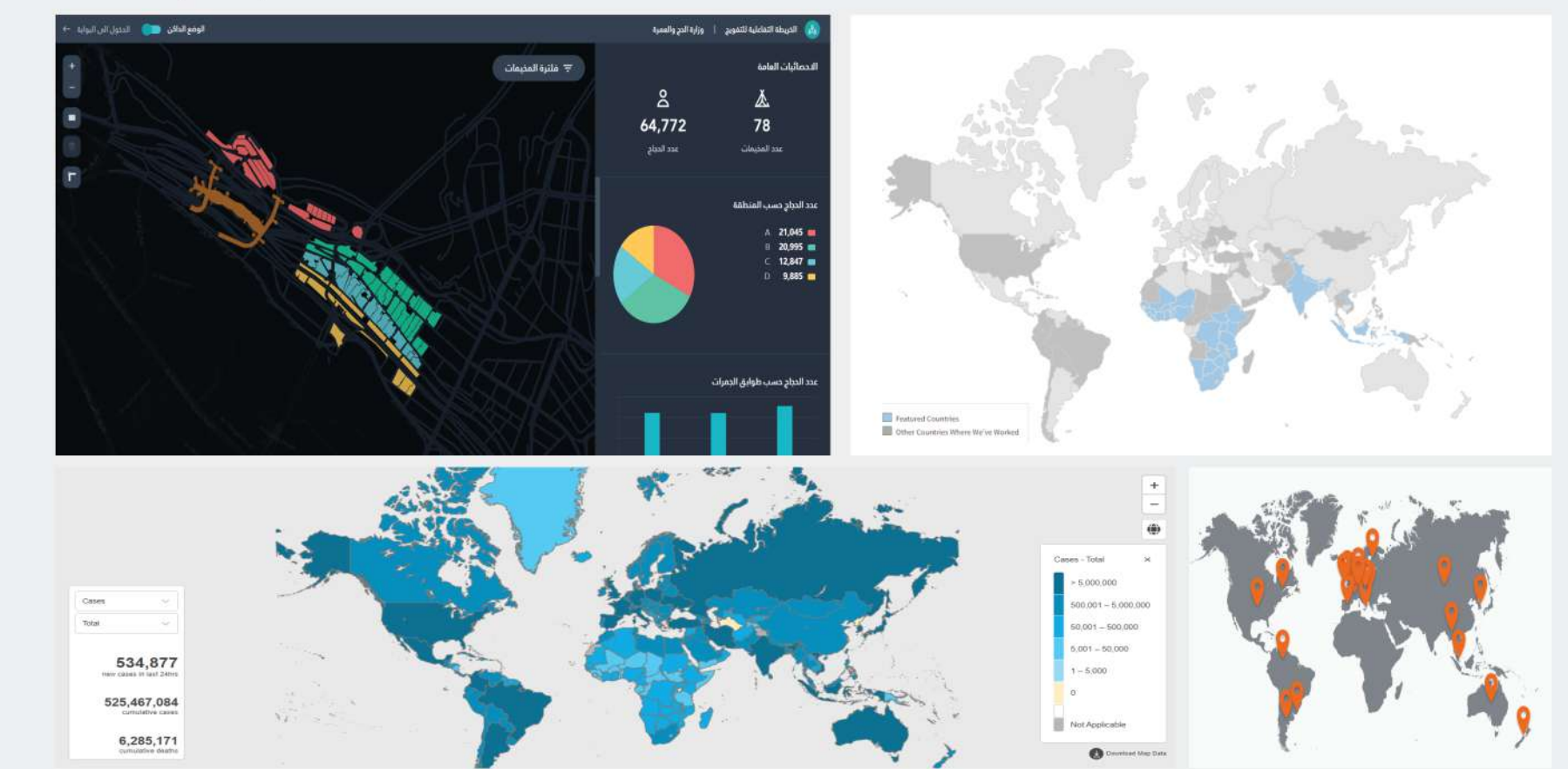
Methodology

For the project management, the Waterfall approach which emphasizes a linear progression from beginning to the end of a project is being implemented.



Existing System

- WHO (World Health Organization)
- Kenan Flagler
- Duke Energy
- IntraHealth
- Tafweej Map

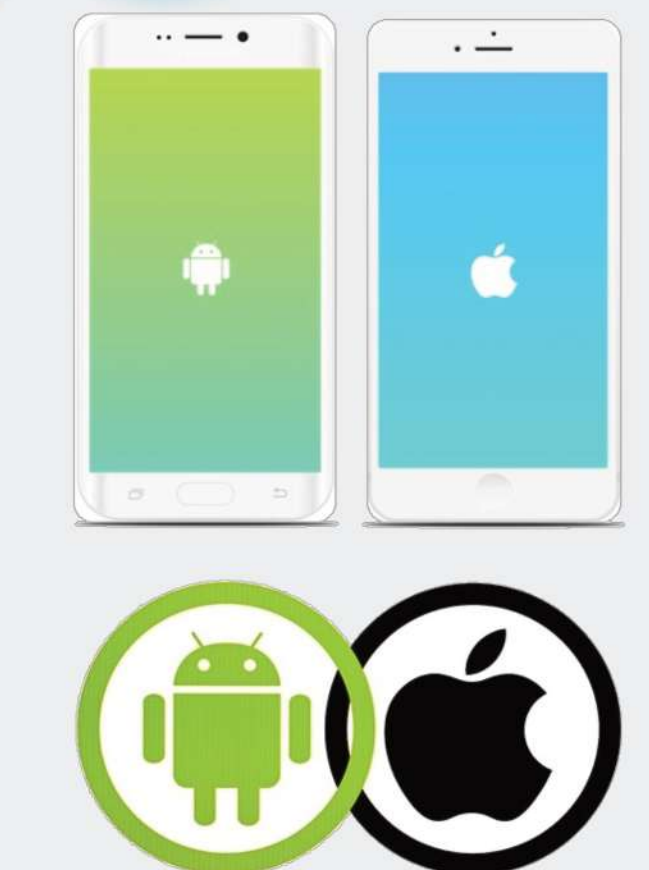


Future Work

- Live Tracking Feature
- Cross Platform Mobile Version



The system will detect the current location of the user and by the time the user enters the destination address, the system will filter the relative routes and it will start tracking the movement of the user in real time.



The current version of the system is an online web application, and I intend to create its cross-platform mobile version which will operate on both android and ios devices.

Summary

Due to the wide area of the Umm al Qura University (the male branch) and the existence of too many buildings and location points on the university campus, new students or other people cannot reach their desired locations on time. So, to solve the problem, for this version, I have built an online interactive map that will provide the vehicle route to the suitable parking slot plus a pedestrian route stretching from the parking slot to the desired location of users. Along with this, it provides statistical information about the buildings and departments in the form of charts and graphs plus it shows to the users 360-degree photos of the classrooms in the faculty of computer science. This map will help users to reach their desired locations on time and not waste their time wandering from place to place.



Contact Information

- obaidipedia.com
- Shoaib Shahzad Obaidi - شعيب شيراز عبيدي
- Shoaib Shahzad Obaidi - شعيب شيراز عبيدي
- Shoaib Shahzad Obaidi
- shoaibshahzadobaidi
- @ObaidiShahzad
- printf.shoaib@gmail.com

Author



Supervisor

- Dr. Khalid al Tarmissi
- kstarmissi@uqu.edu.sa