Plant View - An Augmented Reality Android Application

Matthew Frost | L1426439@live.tees.ac.uk | BSc Computer Science

Description

An augmented reality app that displays information relevant to the user depending on their location. The data is displayed on a graph to show how it changes over time and analytics are applied to highlight any anomalies. The location points are stored in a SQL database to match data points to a location.

The points are plotted on a google maps web application and then a web service is called to store the points in a database.

Requirements

- Use the tablet's camera to show the user what they are looking at and overlay location information
- Use the tablet's GPS and compass to determine current location and direction faced
- Show the change in data over time and highlight anomalies
- Allow plotting of locations on the Google maps web application

Analysis

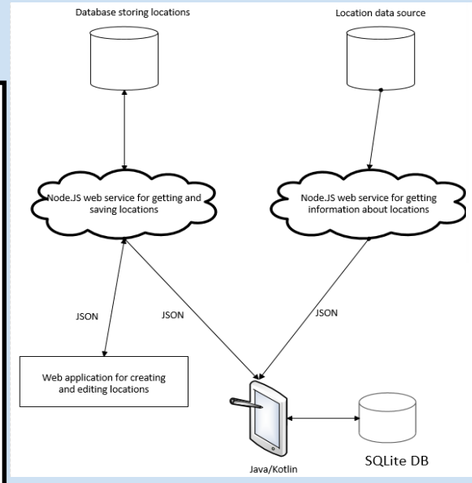
- Met with the client weekly to discuss progress and get feedback/advice
- Researched language choices and libraries to use
- Created mock ups of the user interface
- Created the architecture of the system

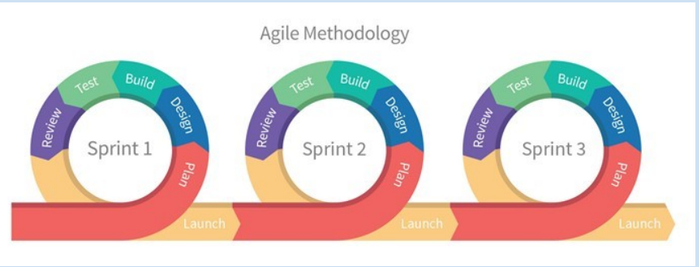
Research

- Researched libraries for Kotlin, this included Kolley which is a library used for better HTTP requests
- Using the Gson library to parse JSON into Java class objects
- Using Google Play Services to get the location of the tablet with the location API
- Using Node JS to interact with SQL Server for both storing and retrieving data

Methodology

An agile methodology is used to develop the project. This allows work to be broken up into sprints and takes into consideration time for rework based on feedback and testing. This is especially useful when working with a real client.





Project Plan

Completed so far Google maps web application, two Node JS web services and Android application has been started with the camera, location and HTTP requests working.

To do Pulling data from data source to app, creating app UI, displaying historical data, analysing the data to detect anomalies, finding direction faced by device

Web Application Flow

Get any existing locations from database → User creates/edits/deletes points → Changes reflected in the database

Android Application Flow

Get user location with GPS → Get points within radius of user → User selects location → Get details of selected location → Apply analytics to data → Show graph and results of analytics

Technologies: AR, Android, Node JS, SQL, Kotlin, JQuery, Knockout JS, MVC

Teesside University

References

- Agile methodology (2014) What is Agile Development? An Introduction. Available at: http://www.screenmedia.co.uk/blog/2014/08/what-is-agile-development-a-brief-introduction/
- Teesside University Logo (n.d) Teesside University Phoenix Building. Available at: http://www.lovemiddlesbrough.com/venues/teesside-university-phoenix-building
- Kolley (2016) ohmerhe/Kolley. Available at: https://github.com/ohmerhe/Kolley
- Gson (2017) google/gson. Available at: https://github.com/google/gson

Legal, Ethical and Social Issues

When trying to find some data to allow the application to be demonstrated at the university there were some ethical issues. It would not be possible to get the data on who or how many people were logged into a lab at one time as this would allow for the tracking of members of staff which is against the universities policies. Even just having the number of people in a room would not be possible as this could be cross referenced with the timetable information to work out which member of staff was in the room.

As the data displayed is provided by a third party and the application itself does not store or modify this data, there are no further legal, social or ethical issues.

Professional and Employability Skills

The technologies that the project is built on are technologies that are either up and coming or are already industry standards. This means that the project would appeal to potential employers. Furthermore the use of an agile development shows that I am used to working in a way that is used in industry.

In terms of professional skills it is important to adhere to the British Computer Society Code of Conduct which ensures that the work is carried out in a professional and ethical manner, especially when working with clients.