TransportAI

The pace of climate change has created an impending ecological disaster. While this has been widely recognised and has led to initiatives such as the Kyoto protocol, many governments have not taken their obligations seriously. The environmental disasters of 2018 have now forced governments to take their responsibilities seriously.

Such problems have created an opportunity for your start-up software development company which develops applications for the auto industry. Your company has been approached by an international automobile company and tasked with the development of a bespoke system which will be implemented for the Irish government. The objective of the system is to develop a prototype which shows how all carbon fuelled motor transport could be eliminated.

A large fleet of electric powered, autonomous (ideally) vehicles will be managed by a system which your team will develop. The system will be loosely modelled on the Uber app and will consist of the following key features:

FEATURES:

Developing such a system means separate applications with different functionality:

- Passenger app – for those who book transport
- An admin panel to manage the process and vehicles from a central point. It is a web (desktop) application that facilitates interactions with customers, manages ride routes, payments and all other data.
- Arduino / 1 Sheeld app to facilitate real time tracking of the fleet

Basic features of passenger app should include:

- **Register/login**: email and/or social media login option and accounts.
- **Booking interface**: a screen to enter the address to call a vehicle to, select the type of vehicle, set a location for pickup;
- **Tracking**: to track vehicle's location, to make updates during or after a ride, etc.;
- **Price calculator**: to check the estimated cost of a ride from point A to point B with certain vehicle type even before ordering;
- **Payments**: cashless and in-app, paid automatically via credit card, users receive an invoice to phone and email;
- **Push notifications**: to keep users updated on order status, estimated time of vehicle arrival, and other details like vehicle model, license plate, etc.;
- **Ratings & reviews.**

Admin panel:

- **Register/profile/status**: with verification and approval by an administrator, plus online status and schedule;
- **Booking**: with options to accept or deny the incoming order, info on customer location and destination of a ride visible instantly, plus booking history;
- **Push notifications**: for order alerts, vehicle booking data (location, payment, route, etc.), for order updates and/or completion;
- **Navigation**: e.g. using Google Maps or Google Places to get optimal directions to a customer and to his destination
- **Cost estimation, reports, messaging, support**.

Each project group should also incorporate a custom feature which is unique to the group. This custom feature should be implemented in more (or more) of the key components of the project i.e. the passenger app, the admin panel or the Arduino code.

Technology:

Programming languages for backend could include Node.js, Python, Java, PHP, Ruby on Rails. Another crucial element to any Uber-clone app is **GPS**. OpenStreetMap API for Android can be used, and other tools could include Google Maps and Google Location Services API.

In-app payments via credit cards may use Paypal. Technology for stack for push notifications will be Google Firebase for Android.

For SMS send outs Uber went publicly with Twilio, though other cloud communication platforms, such as Plivo, Nexmo, Tropo could be considered.

Github or BitBucket must be used for code management and marks will be allocated for their use.

The supervisor will allocate the following to each group:

1) Two Arduino kits
2) A shield from 1sheeld.com

The first application will involve the development of an android app to interface with the Arduino based hardware of **TransportAI**. Development can be done using Android studio or a similar development environment.

The second application will involve developing a web site which will act as a control centre for monitoring the network traffic and providing any intelligence that the passenger app may need.

Reference:

1) https://www.hackster.io/Ashraf_Nabil/tracking-and-controlling-your-car-remotely-using-arduino-and-cc10ed
2) https://www.instructables.com/id/GPS-car-tracking-device-using-Arduino-and-smartpho/

Appendix:

The main features of an Uber type system are outlined below: