

Sprint 0 – Quick meetings

1. Scrum meeting on 2022/07/26 15:00

Summary:

- We decided to use JavaScript as programming language.
- We talked about ideas of connecting the telematic device to a server and how to generate data. It was decided that further research must be done.
- Provisional ideas: design system for Rea Vaya or a fleet of trucks.
- The provisional decision was made to use node.js with Express as the architecture.
- Each person will do further research in their assigned sections.

Task assignment:

- Divided the system into data collection and data calculations (Vian and Tristan), back end (Ivan) and front end (Nic).

2. Scrum meeting on 2022/07/29 15:00

- We decided on Rea Vaya buses as our application.
- We discussed the architecture layout.
- We discussed the format of the data and that it might be a design constraint.

3. Scrum meeting on 2022/08/02 15:00

- Firstly, each member reported what they are busy with:
 - o Ivan: Set up data control access so that admin users have access to all the data while other users will only have access to the presentation layer.
 - o Van Niekerk: Accessing the database and using the values to do calculations for fuel consumption. Researching different methods for calculating fuel consumption for fuels: petrol, diesel and natural gas. The latter two is used by Rea Vaya buses.
 - o Tristan: He is doing research on how to send data from device to a server and he is investigating which ports Rea Vaya buses have available for telematic devices.
 - o Nic: He has a contact which can send us real data retrieved by telematic devices in trucks. He also is doing further research in how to present the information.
- We decided to continue with the Rea Vaya application until the end of the week and if calculating the fuel consumption of diesel/ natural gas is too time consuming we will revert to petrol cars only.
- The business model we decided on for now is that our web application will be used for analytics – we will present the average energy usage of each Rea Vaya route.

4. Scrum meeting on 2022/08/08 15:00

- We met after the meeting with our supervisor and discussed some of the questions asked in the meeting.
- We discussed which framework we will be using from now on and decided on the agile framework. We decided that our current implementation is the experimental phase and will be the first release. After the first release we will strictly follow the agile model. We concluded that this was done because we first had to define the scope of our project and do experiments to determine what is possible to implement.
- Ivan mentioned that using HTTP 2 will increase the scaling the web application, but it will however incur expenses and is not viable to implement in the MVP.
- Van Niekerk mentioned that he is finalising the kinetic energy model and want to compare it to the petrol fuel calculation model, but at this stage the diesel model appears to be too complicated to implement for the MVP.
- We discussed our application of measuring the energy usage of Rea Vaya buses. Tristan mentioned that there is limited information available on the ports used in these buses and Van Niekerk said that the buses use diesel which requires complicated calculations that may not be viable to implement in

the MVP. We decided that the Rea Vaya idea is too narrow and that may limit us and put more focus on the specific details than the design itself.

- We decided to brainstorm further about our specific application and business model and decide on it on Wednesday (10/08). Some ideas that were mentioned: measure energy usage of cars that drives for Uber or for a fleet of trucks.
- Van Niekerk asked Nic what he wants to display on the front layer, as that will impact how he presents his outputs. Nic said that he wants to display the energy consumption of various drivers' vehicles on the same route. He mentioned this might still change depending on our choice of application.
- Van Niekerk mentioned that for him to implement the petrol model he needs data on the mass air flow rate. Further research needs to be done on how to obtain this data. Further research also needs to be done on how to obtain data for the kinetic model, because at the moment we use data from a paper.
- Ivan mentioned that we can only have 24 pins on the web app which limits the number of points we can show the energy usage.
- Van Niekerk asked Ivan where he accesses the `calculationFunctions.js` script and he said he accesses it in the server socket handler.

5. Scrum meeting on 2022/08/10 15:00

- After some discussion we decided to focus on the following application: Obtaining data is a challenge now and we will mitigate for this by only considering one route. We will consider different vehicles and different times of day for the one route in order to compare energy usage of one vehicle at different times of day and compare different vehicles energy usage. The business model we decided on entails that a business can make decisions on which vehicles to use, and which time of day requires the most energy if they want to convert to alternative energy.
- We made our first release and decided to start our second sprint on Friday to give everyone enough time to think about features they want to add.
- Van Niekerk asked Ivan how the app will scale during the day, Ivan answered by explaining that JavaScript is single threaded and runs parallel instances of the sever. The cloud deploys to the instances with the least load and will therefore be able to scale according to the influx.
- Obtaining/ generating the data is still an issue. As mentioned above by only deciding on one route, it will make it easier, however we are still finding ways to do this. Van Niekerk will work with Tristan on this.
- We discussed what values are determined by the type of car and Van Niekerk will do further investigation on this. He must send the elements through to Ivan before the end of the week so that he can add it to the database and Van Niekerk can start calculating the energy usage of different cars.
- We also discussed what slides of our design we will present to Prof Nixon on Monday. Ivan made a diagram showing our whole layout and the other three guys said they are going to make block diagrams showing their logic.