Monthly Blog 7

Throughout the final month of our project, we focused on integrating and testing various components of our system, as well as refining the final product through numerous meetings with our client from Avanade and Dr. Yun.

1 Progress

1 Algorithm (Tony)
1.1 Algorithm Optimisation

At the beginning of March, Tony decided to replace the model we were using to predict future emissions. On the grounds that while the LSTM model was powerful, the data we can access to was not sufficient to allow its complex structure to thoroughly learning carbon emission model. As a result, the model it produces after spending a lot of time and performance are not satisfactory. Therefore, Tony decided to use the simpler model, namely SARIMA, as an alternative.

By the time you read this, you will have seen a report on the algorithm on our report website, including an explanation of why it is better suited to our situation.

1.2 Advice Generation

The original plan was to analyse the information in the data sets one by one and manually give recommendations for different situations. However, by the suggestion of our TA, we decided to use GPT3 to generate recommendations that would be more appropriate to the situation. To do this, Tony modified the original advice generator to filter key data from the dataset and written into prompts to feed GPT-3.

2 Integration (Sam)
2.1 System Integration

Meanwhile, Sam focused on integrating the front-end and back-end applications, and optimising the system to improve the user experience. This included:

1. Frontend and Backend Integration.
   - Allow frontend application to display carbon emission data properly by calling API endpoints in backend application.

2. Frontend Adjustment.
   - According to client suggestions, deleted the Real-time Usage page, move the real time carbon emission map to the welcome page, provide select bar to switch between different database in Azure, etc.

3. Advice System.
   - After Tony corrected the prompt generation application, integrated into the back end with the GPT3 API to allow the dashboard to display the suggestions properly.

2.2   System Optimisation

After the data was displayed properly on the dashboard, we discovered that data will be fetched once we switch the page. This lengthy process that lead to a poor user experience. In this case, Sam introduced a caching mechanism, by temporarily retaining the data in the variables, to improve the consistency of use.

3   Testing (William)

As soon as the system is integrated, William started testing:

1. Unit Test
   - To check the accessibility of every route provided by the backend system, as well as the correctness of the data it provides.

2. End-to-end Test.
   - Make use of Cypress testing library, to test all interactable elements in the system to be responds correctly, such as theme switching, page switching and hiding selected advice.

3. Performance Test
   - Used React Development Tools to check the speed for rendering every component.

4. Responsive Design Test
   - Try running our dashboard on different systems to check its compatibility under different environments.

5. Browser Compatibility Test
   - Try running our dashboard via different browsers to check its compatibility in different platforms.

6. User Acceptance Test
   - We invited four testers to participate in our user acceptance test, to receive feedback on the use experience from different kinds of user. Thus giving us a better understanding of the usage aspects of the system.

4   Report website (Ramit)

For the report website, our report website leader Ramit has strictly followed the requirements from "COMP0016 Deliverables and Assessment" to finish every item in the website. By assigned each project to different group member, he ensured that we can produce a high quality report in the most efficient way. Once the report is finished, Ramit was responsible for placing them on the website in a reasonable layout. And by the same time, by discussing with our tutor and client, he corrected all items that were created improperly, including the Use Case Diagram, the MoSCoW list, etc.