INTERNAL ENGINEERING COMPETITION 2021

Programming Competition

Inspiration

Due to the unprecedented nature of events that have occurred in the months leading up to right now, the University known as Ontario Tech University requires a contactless method for ordering items and goods from local businesses / suppliers. Our group has put together a mobile application that can solve this problem. Leveraging our group members previous knowledge in react native, mysql, nodejs, (((and other platforms))), our group created a seamless and lightweight application that easily connects the end user to the suppliers stocks.

As group members on this team would be the main target demographic from this application, we felt apt to draw from the experiences of other platforms available on the market and take advantage of the parts that fit the best into this system. Automated bar code (QR or otherwise) generation is integral to the contactless part of the requirements. As the QR is scanned, the information it contains is scanned by the application and draws the required balance from the users credit. The QR code directs it to the correct wallet where the transaction can be securely handled by the server.

Team Dynamics

Because of the nature of the limited time frame, most members of the group helped everyone in other parts however the main structure was:

- Avdon - login /authentication
- Daniel - reports / database
- Eric - API / Server
- Harasees - Frontend

Intro

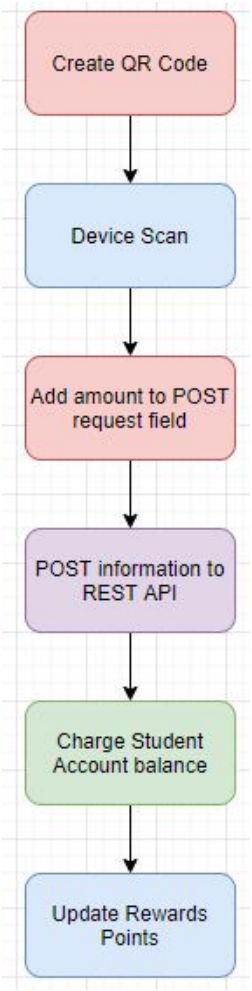
For this challenge, our team decided to build a mobile application using React Native so that we can target both IoS and Android users on campus. Our plan is to implement a login service using some form of O2 authentication such as the G-Suite API or the Octa API. This will allow us to integrate existing student accounts with our code base. Then our group will focus on a payment service using a MySQL database to track student ID, account balance, and rewards points for purchases.

Next Steps

The next steps for this project include actually getting access to student accounts and money. For now the application works with test data and only can work off of what the user gives it. Connecting a real student account to a wallet would also have to be done in a secure way. Using Google's O2 authentication API, we could authenticate a student using their G-suite account and retrieve their student ID and session key using this method. Then we can tie their student number to our API in order to process transactions and reward points tracking. The API generates a unique purchase link per each student ID and can be secured alongside a session key when handling purchases from the backend. Then, scanners, and barcode readers can scan this QR code, add the amount for the cost of the purchase and send a request to the transaction API that has already been implemented.

How it Works

The general idea of the application is to create an easy payment service for students to use when using on campus services such as the book store or food vendors. The student opens the app which gets a unique QR code that they can scan which corresponds to their account. This code will allow the campus vendors to charge the student's account a specific amount if they have the correct balance or amount of redeemable rewards points. The following is a rough idea of the flow of the program:



The app will get the QR code from a REST API and the QR code will allow the vendor to charge the student account the specific balance. They can also choose to redeem rewards points if they have enough for the item. If neither balance has enough, the API will return unsuccessful and the vendor will be notified that the balance could not be charged. The student will be able to add funds to their accounts in the app if this is the case.