

**Pasig Catholic College**

**Bachelor of Science in Information Technology**

**IT104**

# ***Traverse***

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## ***General Objective***

This project seeks to provide its users an alternative, modern, and more automated way to go about their daily commute in the Metro's railway system: booking their train in advance, providing real-time updates of delays and early arrivals, and shortening queuing time.

## ***Specific Objectives***

For a more detailed understanding about the project's purpose, the proposed system seeks to achieve the following:

- To develop a mobile application that helps users book their tickets for their commute earlier and track vital information about the train's status and the user's travel history.
- To significantly lessen queuing and waiting times in the train station, giving more time for commuters to prepare for the arrival of their train.
- To provide the administration and maintenance staff detailed information about the trains' past inspections and vital observations during its maintenance and use.
- To become a basis in modernizing and automating ticketing systems, further incorporating the technology into the transportation sector.

## ***Introduction:***

Traffic in Metro Manila ranks among the worst in the world, taking an average of 5 minutes just to travel one kilometer (Waze, 2019). This is a direct effect of numerous reasons, poor urban planning in the Metro and inefficient public transport, including infrastructure, just to name a few. Because of these factors, it is estimated that this costs businesses around 2.4 billion pesos per day in 2012, and if no measures are taken, it could reach up to 6 billion pesos per day by the year 2030. (JICA and NEDA, 2014)

Railways like the Manila Light Rail Transit System (LRT) and the Manila Metro Rail Transit System (MRT) are some of the most efficient modes of transportation around and about the Metro, with MRT Line 3 having the capacity to carry around 1,576 passengers and LRT Line 2 having a slightly higher maximum capacity of around 1,628 passengers in a single trip. These railway transits can travel from one station to another in just about 25-35 seconds (top speed), covering the entire line in about 30 minutes (Ganiron Jr., 2015), including loading and unloading times (MRT Line 3).

Despite the speed of the railways, a great number of passengers still wait an average between 6-7 minutes (Eagle News, 2020), just waiting for the next train to arrive at the station. Add to this the long queue for buying tickets and checking bags in the entrance, the passengers lose precious time to prepare for their commute, and the railway operators losing out on passengers who opt out after seeing the long lines while climbing the stairs up to the station. But what if we remove the line altogether?

Traverse is essentially a train hailing app. Users can pre-book their tickets anytime and anywhere after selecting their desired time and location. The users will be given a

QR code ticket which can be saved locally or be viewed in their booking history, which can then be scanned at the entrances of each station platform, reducing the waiting time to prepare and board their trains. The app also tracks the arrival and departures of the trains, updating the app and informing the users about possible delays and problems encountered. The users can also rate their commute and even give the operators and staff a tip as thanks for their service.

### ***Stakeholders & Participants:***

The participants and stakeholders are the daily commuters in and around the metro, especially those who use the metropolitan's railway system as their main form of transportation to and from work/school/recreation. The participants were chosen because they have long standing experience with these kinds of app and they are already familiar with the difficulties of commuting around the metro. 67% of the respondents come from Pateros and Taguig while the remaining 33% comes from Pasig. All of them are students who use the train whenever they will be travelling for recreation and leisure.

## ***Review of Related Literature and Studies***

### ***Foreign***

#### ***1.) UTS***

UTS is an Indian Railway app on android. It lets the user book tickets according to their liking and also offers season tickets and QR Booking for faster boarding time. You can cancel the tickets provided that the ticket is not yet printed. It also has a wallet for the users to use to pay for their tickets. This is relevant to Traverse because this will be a big help as serving the basis of the app since a lot of the features that Traverse aims to implement is already implemented in this app and it has been in use for months now by the community and has already garnered an average of 4.2 stars in the Google Play Store.

#### ***2.) IRCTC Rail Connect***

The IRCTC Rail Connect app is similar to the UTS app. It offers almost all of the same features but also adds an additional layer of security by implementing “advanced security features of self-assigned PIN to login without entering username and password on each login”. It also has a more user-friendly GUI and is only available on the Apple App Store. This is relevant to Traverse because like UTS, a lot of features that the app aims to provide is also featured here and it has also been in use since 2019 and already garnered a higher satisfaction rating than UTS with an average score of 4.5 stars in the App Store.

## ***Local***

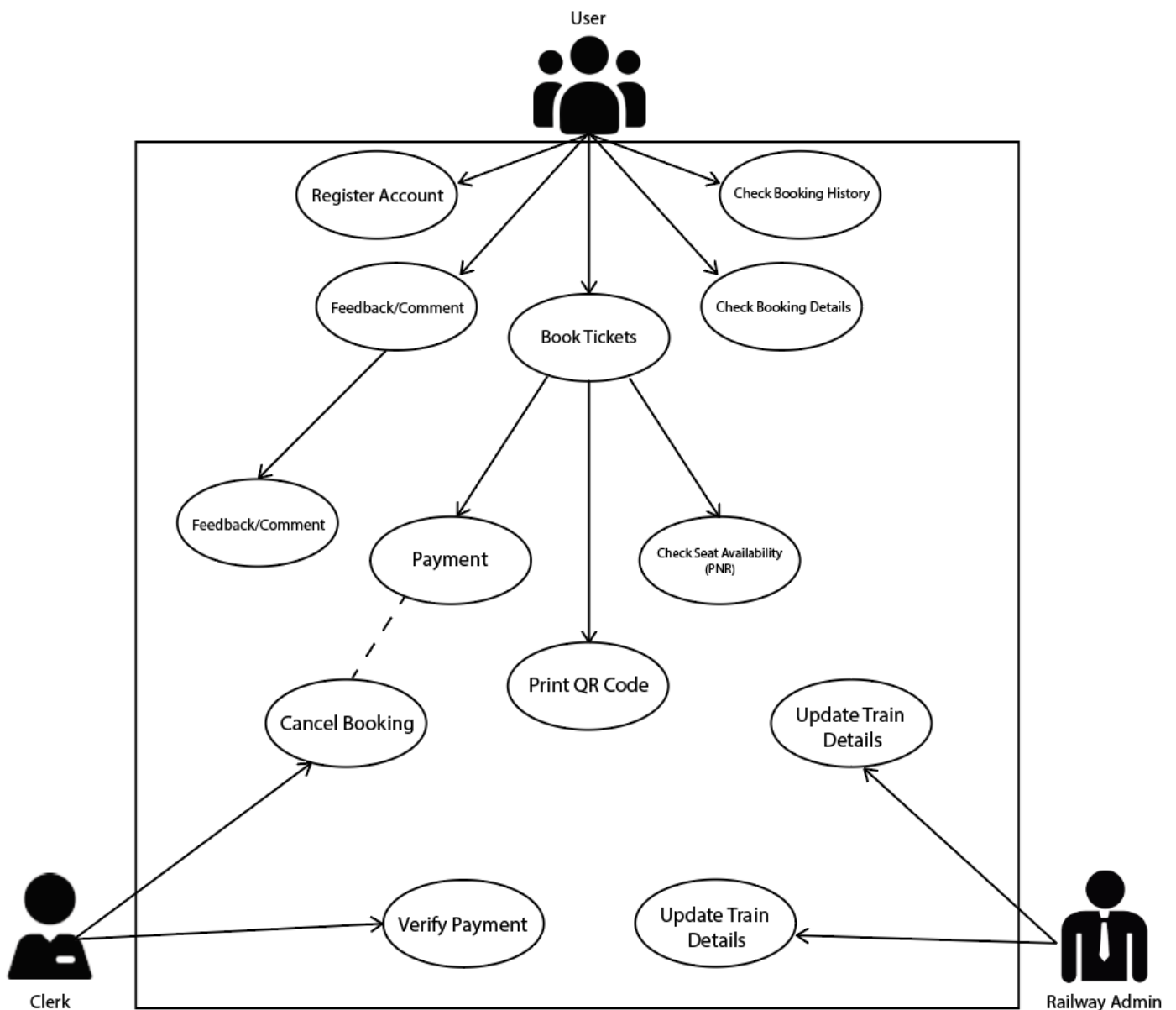
### ***1.) ikotMNL***

The ikotMNL mobile app for riders of the LRT-1 features real-time train arrivals and departures, fare information, crowd information in all stations of the LRT-1, and many others. The app also promotes local tourism by featuring hotspots along the LRT-1 route. This is relevant to Traverse because it is one of the first mobile apps that give information about LRT Line 1 and this could serve as basis for the inner workings of the application.

### ***2.) Philippine MRT/LRT Trains***

The Philippine MRT/LRT Trains provide useful information about the train lines of LRT1, LRT2 and MRT3. This app gives information about the travel time, distance and fare between stations. It can also show users how crowded it is in the MRT3 stations by accessing MRT3 CCTVs. You can also search for nearest train station, ATM, shopping malls, restaurant etc. This is relevant to Traverse because it provides additional features that can add to the functionality of the app.

## Use Case

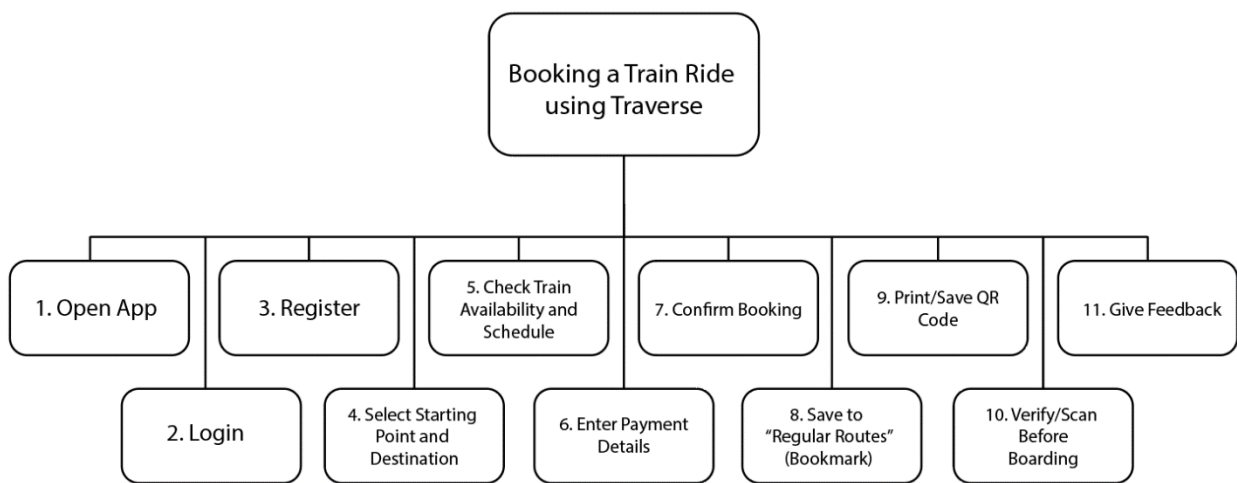


The user first needs to register an account to access the features of the app. After registration, the user can now book tickets, check booking details, check booking history and view train status. When the user books tickets, they can check seat availability for PNR trips and proceed to print the QR Code after buying the tickets. The clerk can cancel

*the user's booking anytime provided that the user has a valid reason. The clerk will also verify the payment before the user goes to the platform. The admin will update train details and train status. After riding, the user will give their feedback.*

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### ***Hierarchical Task Analysis***



### ***Tasks***

Open App

Login

Register

Select Starting Point and Destination

Check Train Availability and Schedule

Enter Payment Details

Confirm Booking

Save to "Regular Routes" (Bookmark)

Print/Save QR Code

Verify/Scan Before Boarding

Give Feedback

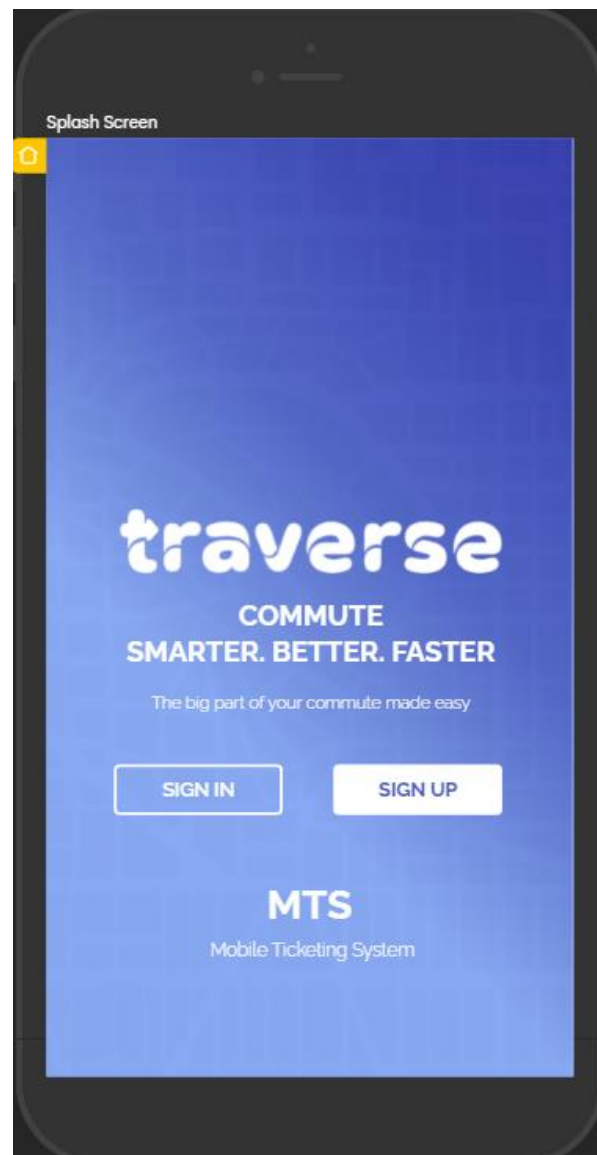


**New User: 1, 3, 4, 5, 6, 7, 8, 9, 10, 11**

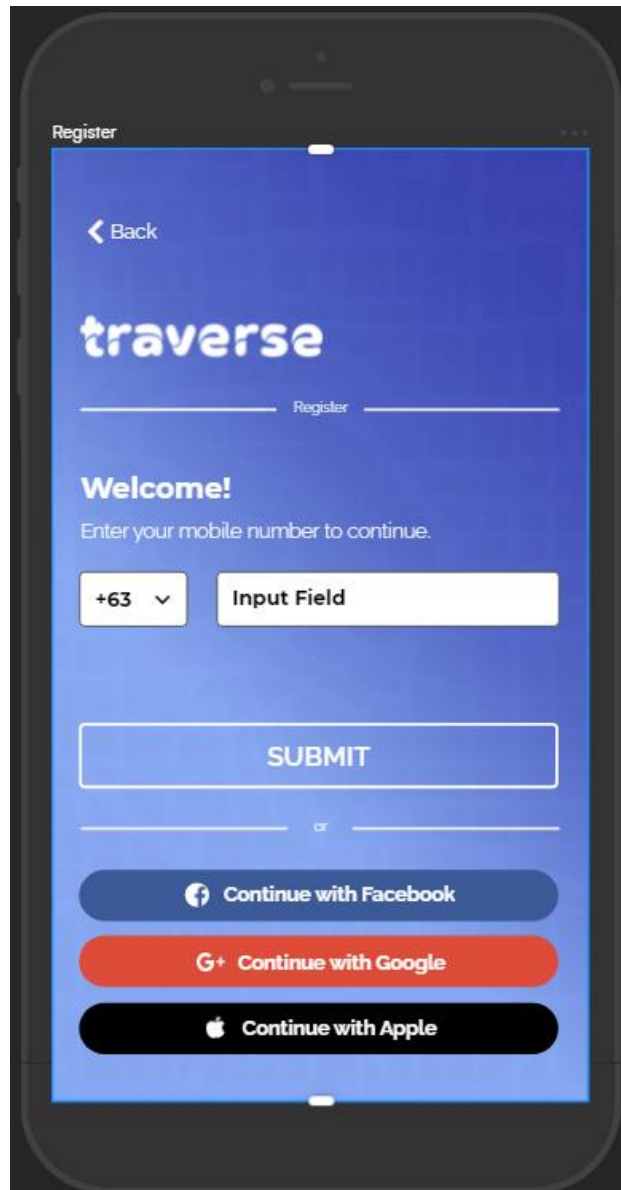
**Regular User: 1, 2, 4, 5, 7, 9, 10, 11**

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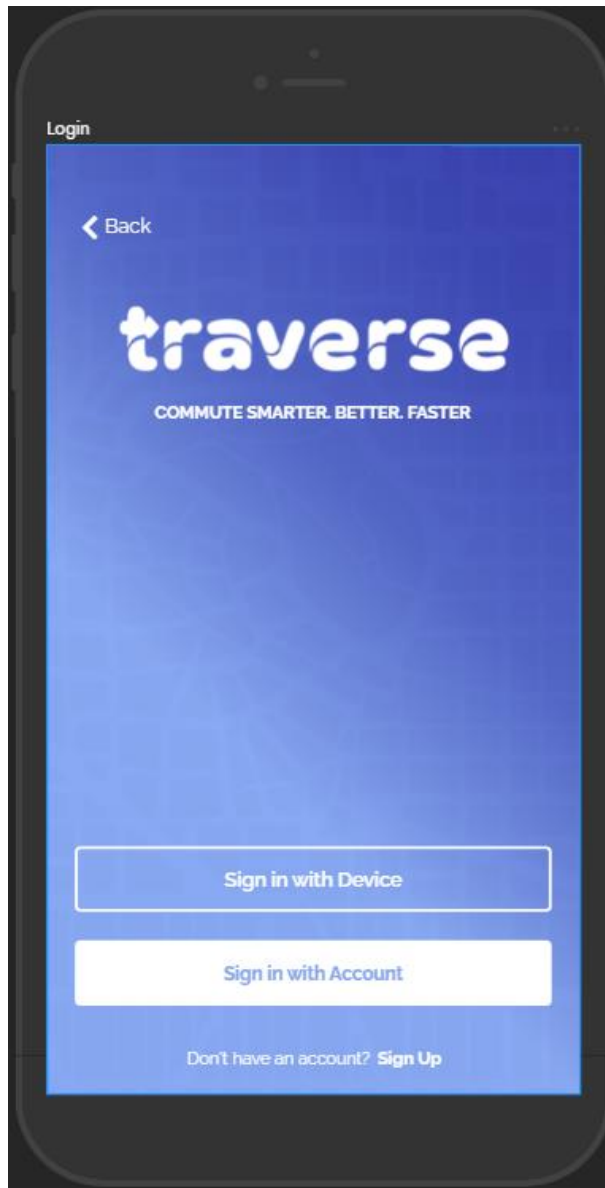
### ***Design Mock-up***



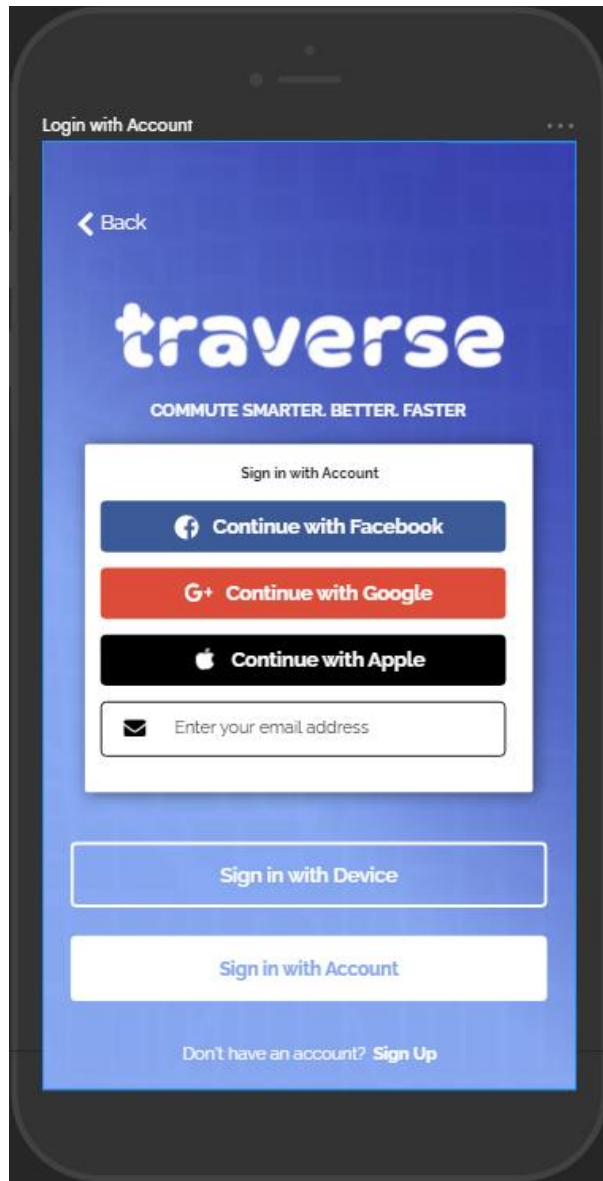
***Figure 1. Splash Screen***



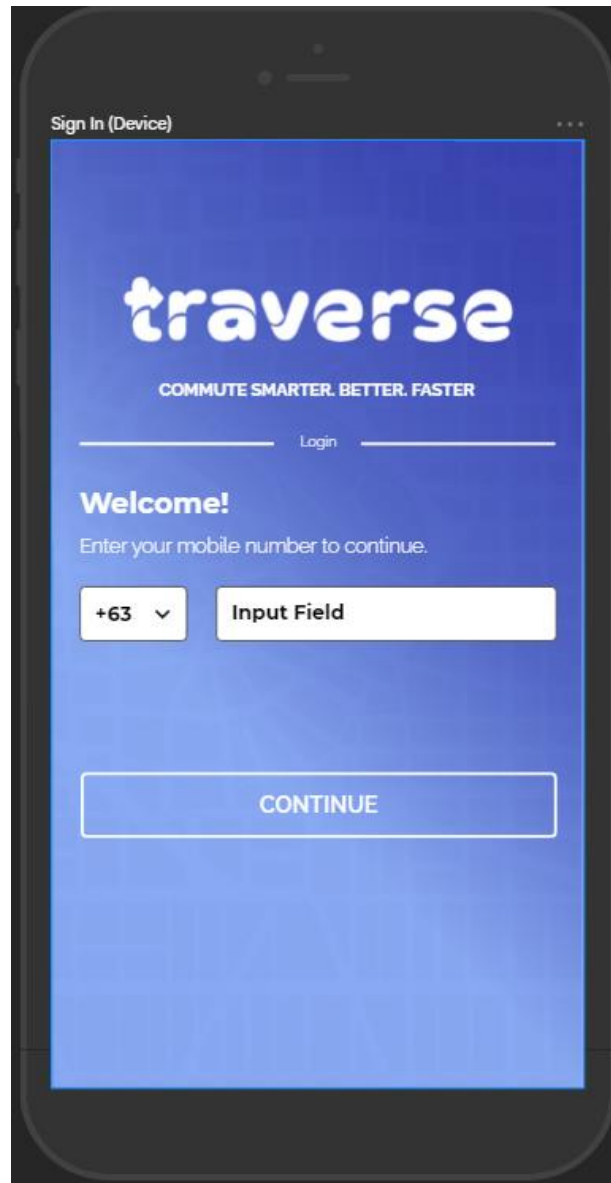
***Figure 2. Register***



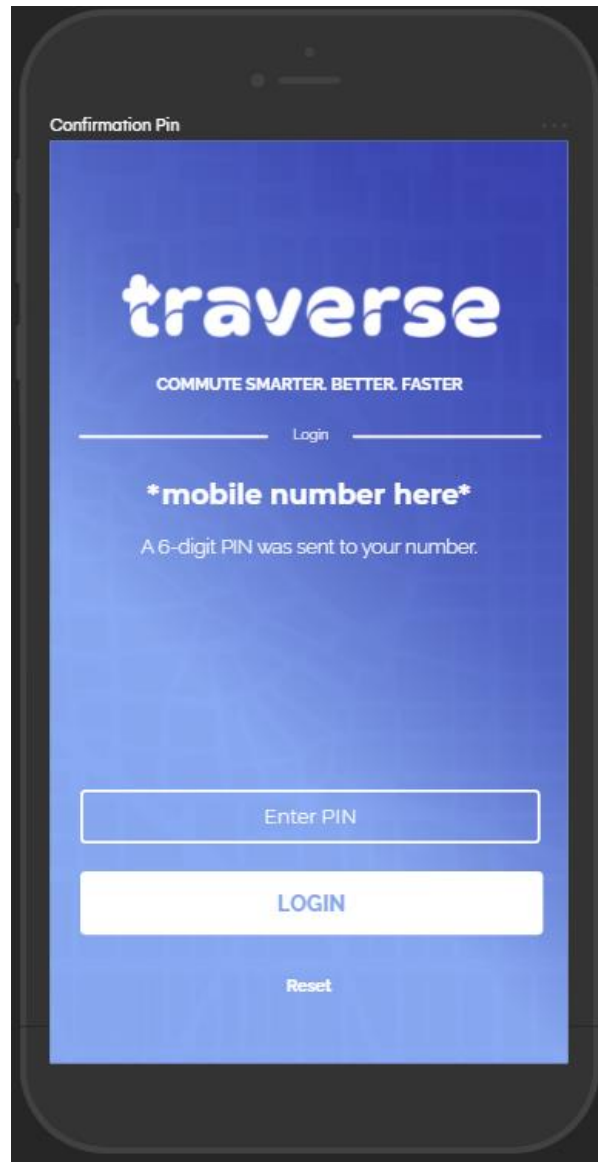
**Figure 3. Login**



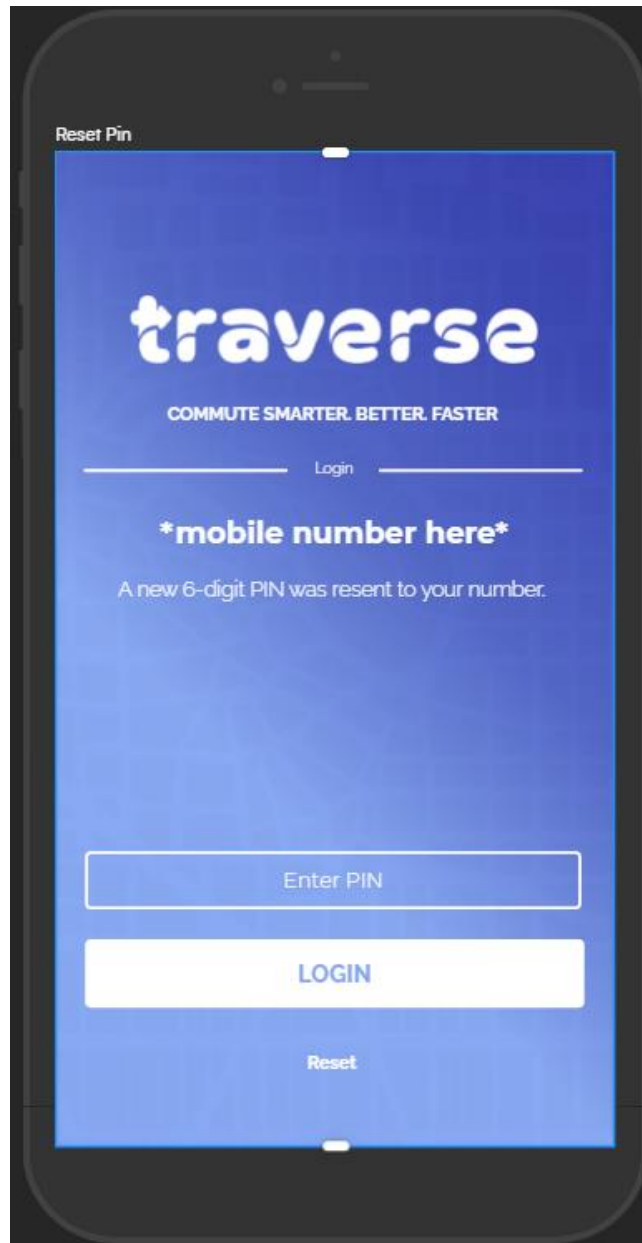
**Figure 4. Login with Account**



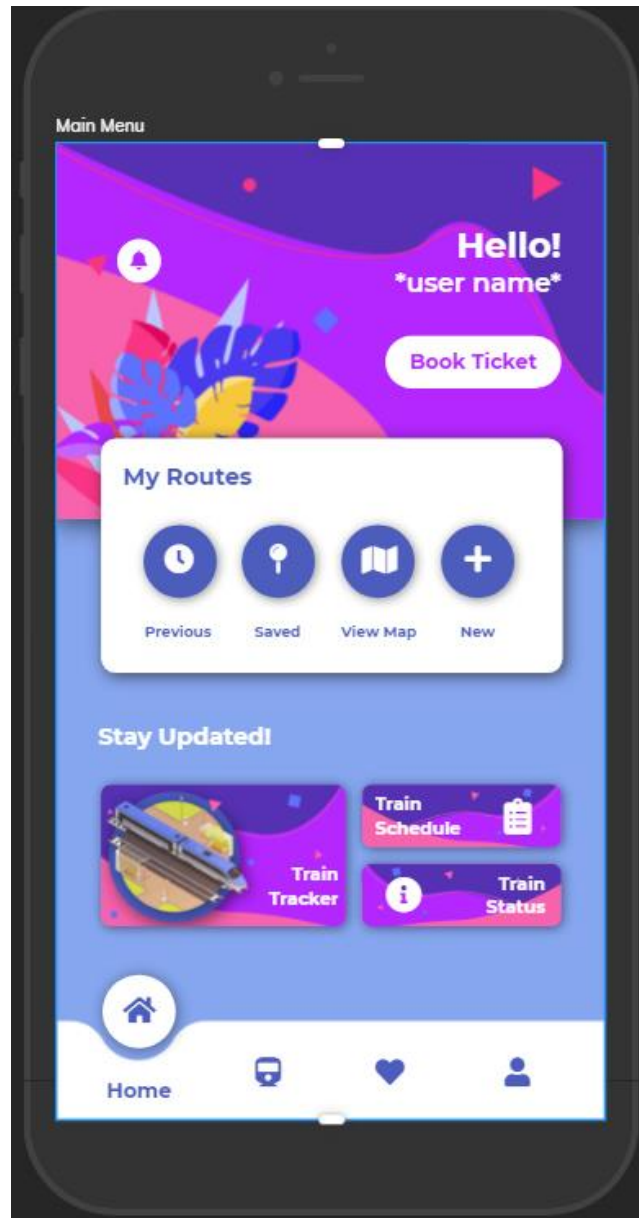
***Figure 5. Sign In (Device)***



***Figure 6. Confirmation PIN***

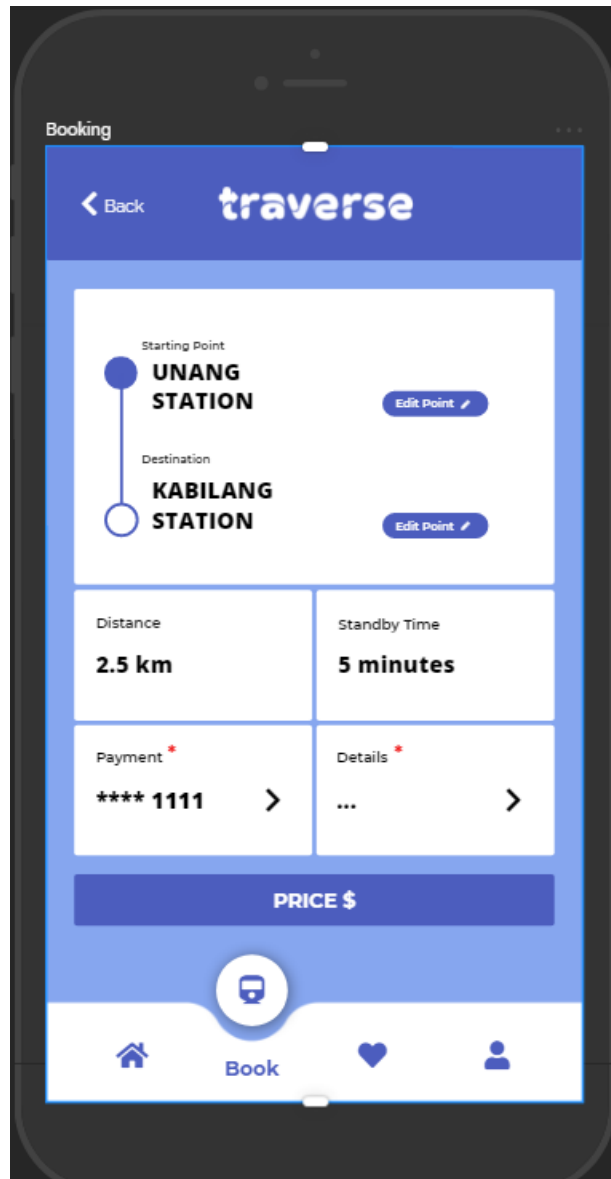


**Figure 7. Reset PIN**

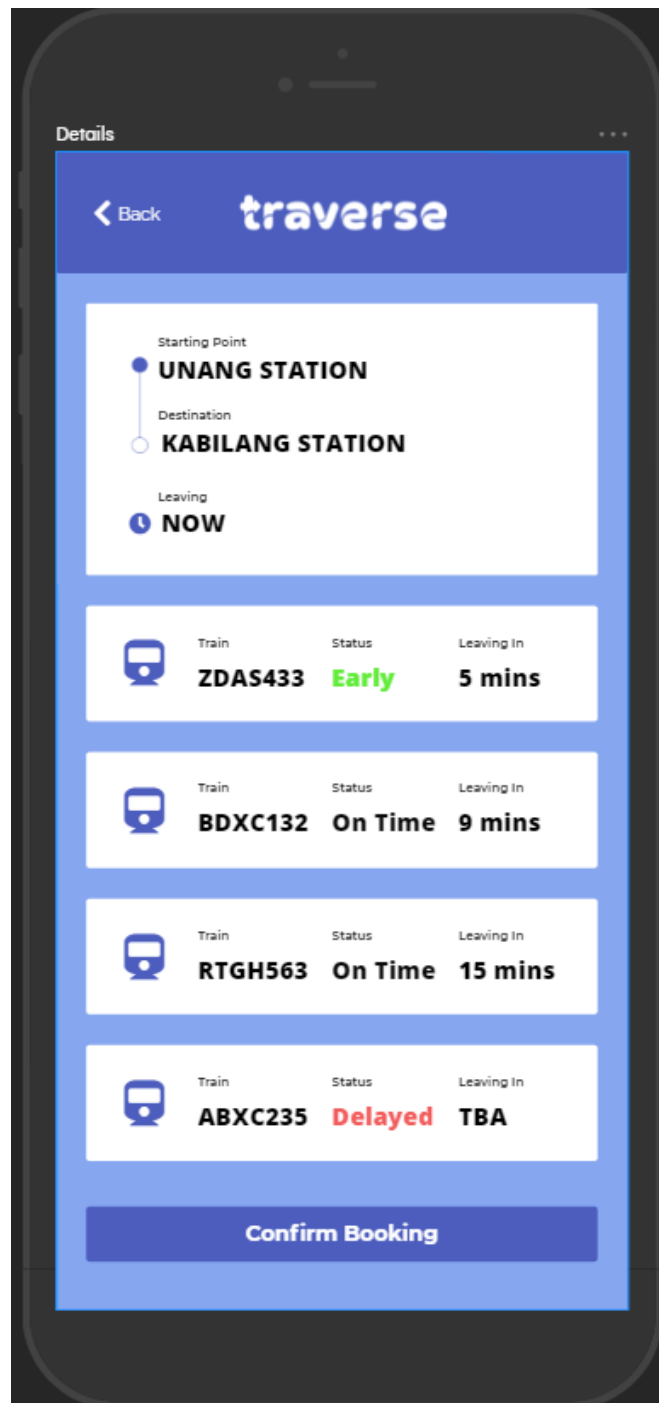


**Figure 8. Home**

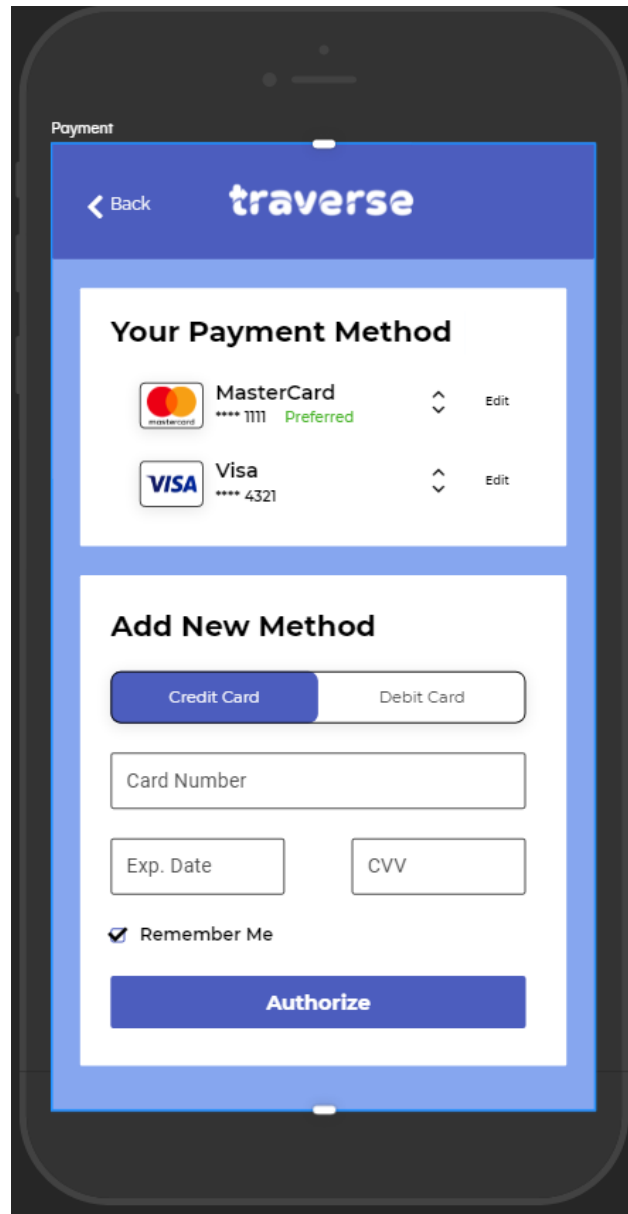




**Figure 9. Booking**



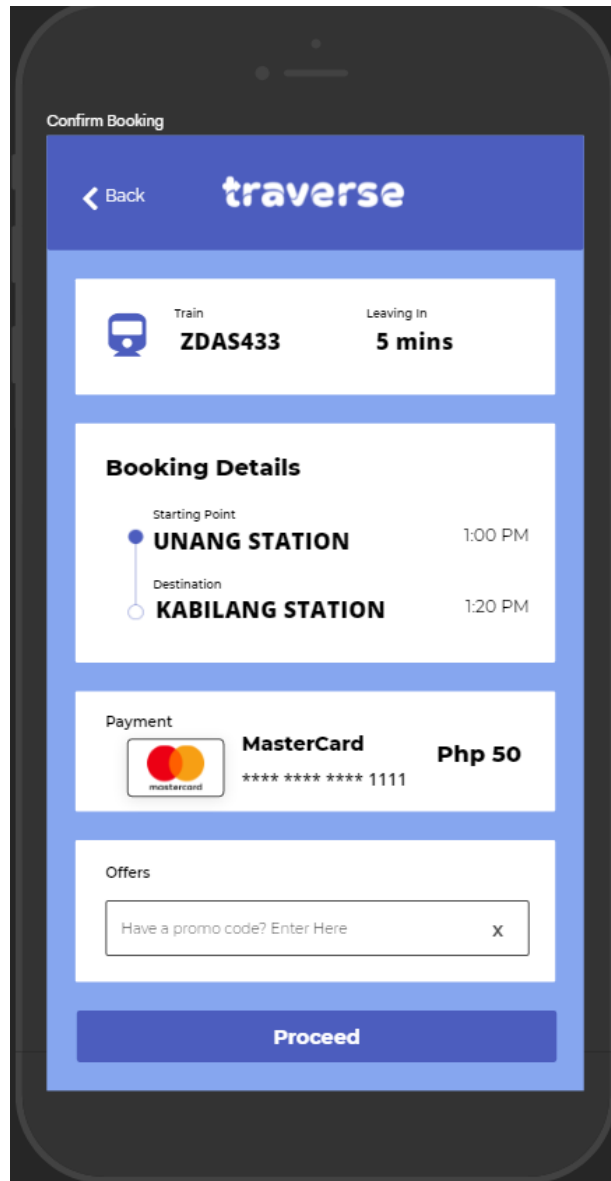
*Figure 10. Travel Details*



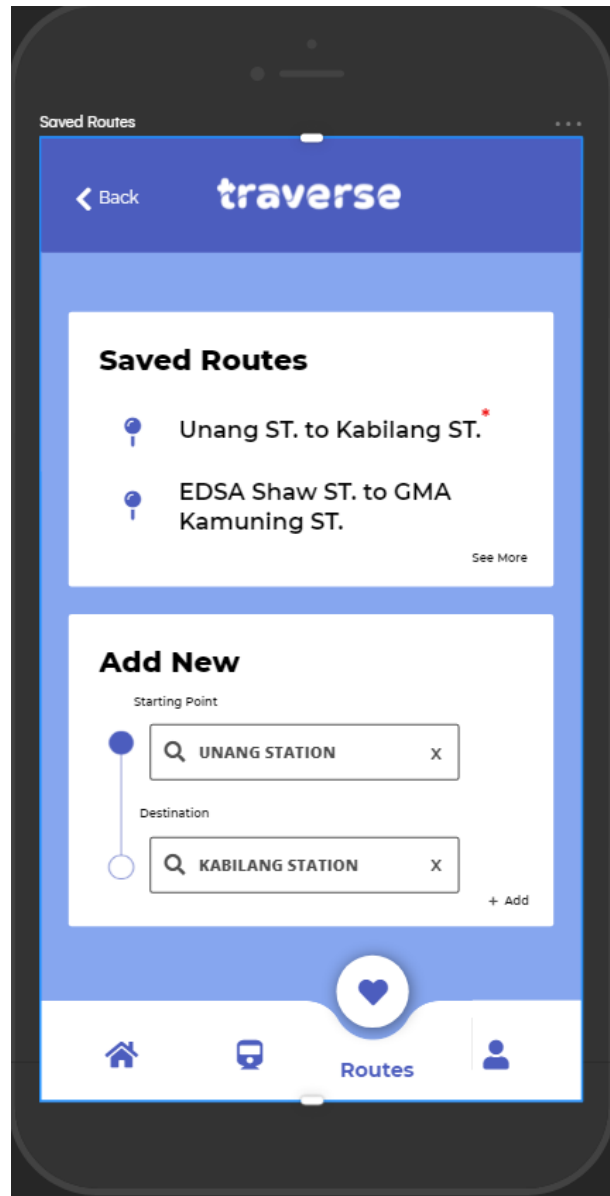
**Figure 11. Payment**



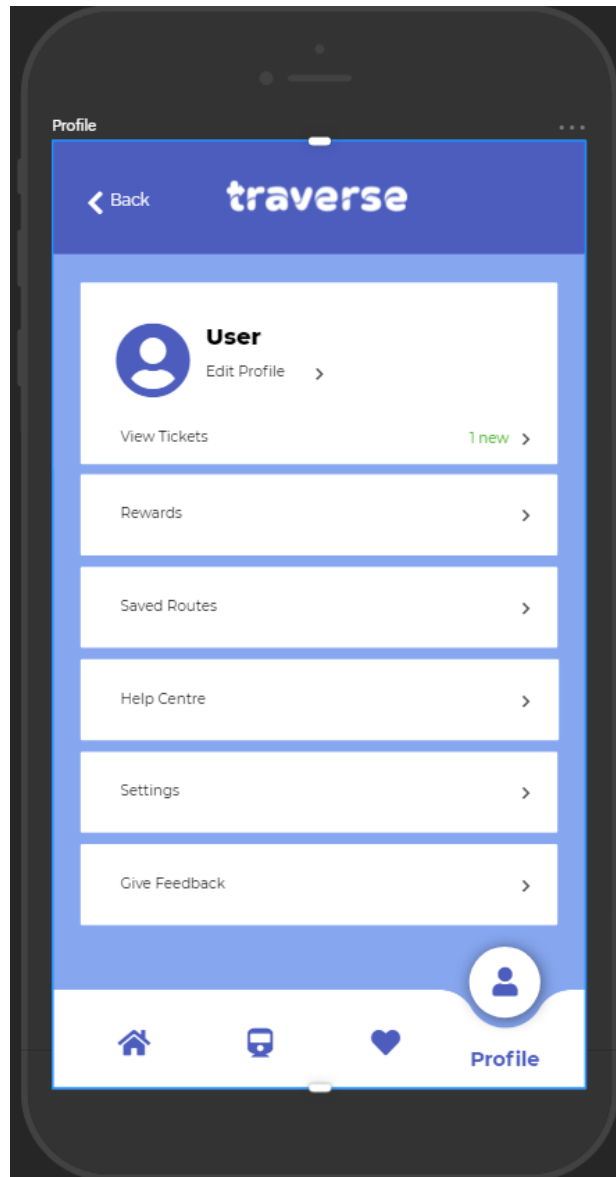
**Figure 12. Select Destination**



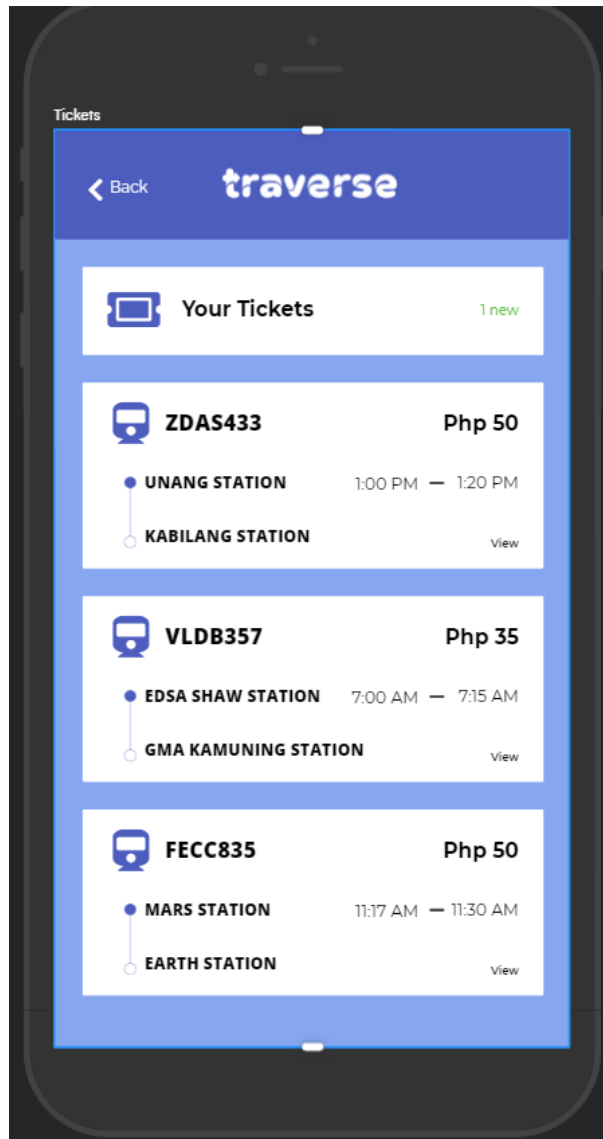
**Figure 13. Confirm Booking**



**Figure 14. Saved Routes**

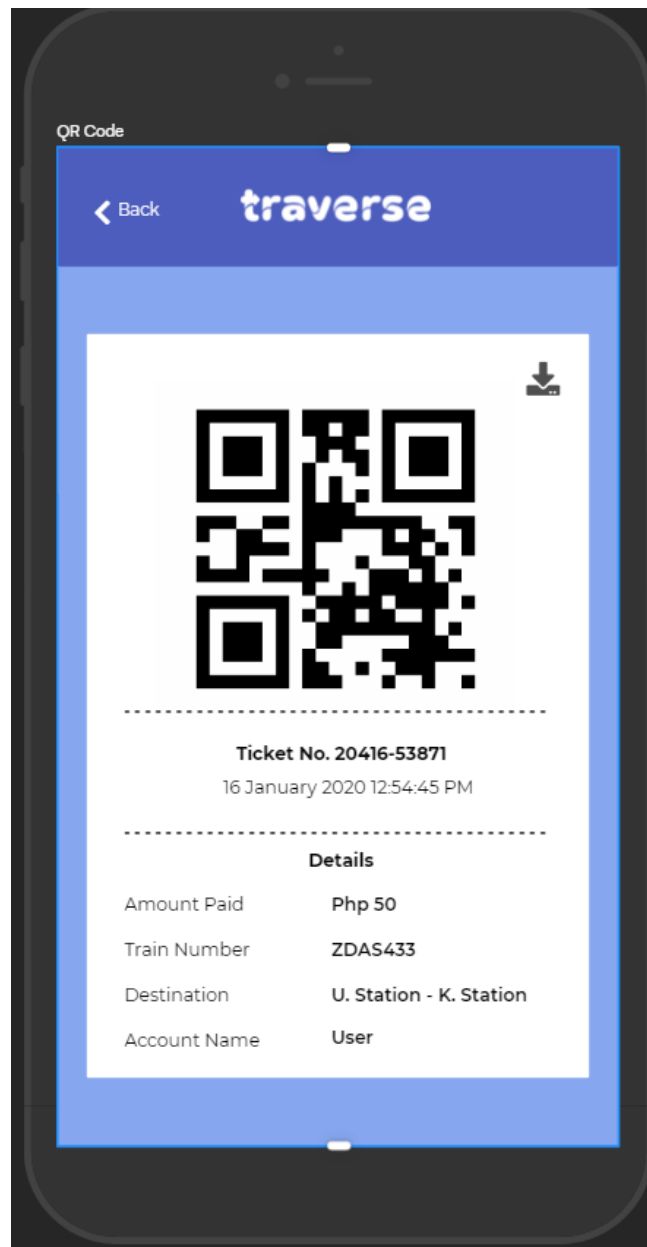


**Figure 15. Profile**



**Figure 16. Tickets**





**Figure 17. QR Code**

## ***Summary of lessons learned***

- Use proper headings
- Fix font hierarchy
- Limit the use of fonts to two
- As much as possible, use sans serif fonts to be easily readable
- Keep in mind the reach of the users fingers, especially the thumb when designing buttons
- Don't use too strong colors
- Always give a reaction to a user's actions
- Avoid using fonts that are very light or very heavy.
- Limit colors to at most 3 at a time
- Place important information at the easiest places to spot