PROJECT REPORT

TravO

Project Execution : XL Solutions

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INTRODUCTION

Covid19 pandemic and its severe broad spectrum impact on the whole world brings us to a new era or a new normal. According to the latest report, people all over the world has to live with this virus for some more time to come.

The virus spreads on exposure to the same environment where the affected patient has visited. Facilities like public places, public transport and other public facilities are expected to be the major points of transmission for Covid-19. Thus every government has introduced guidelines for travel restrictions which affect both public transport operators and those who use public transport. The emerging issues are many. First is that, operators cannot allow maximum passengers as permitted earlier. Second is that people have minimized their travel because of government restrictions and fear of contracting disease. These two factors alone will create disparity in the earlier existed demand and supply. Some of the significant problems emerge because of this is that many trips of operators will be unviable because of lower occupancy and so they are likely to cancel trips in the long term. Such a situation will result in people to wait for indefinite time to get a transport facility. This will create cascading effect on the entire business model of public transport which will result in incurring heavy losses for them and sort of inconvenience for commuters. A solution to track demand specifically and optimizing transport frequency according to the demand will be the key to solve this issue.

PROBLEM SURVEY

1.1 REALIZATION OF THE PROBLEM

PROBLEM STATEMENT : Intelligent Post-Lock Down Management System for Public Transportation.

Post-lockdown will be very risky to allow the public transportation without a properly streamlined and fine-tuned mechanism in place. Traveling without maintaining approved social distancing norms will enhance the rate of transmission of the disease. With no proper treatment plan and a vaccine in sight for Covid19, every country need to stick to its basics like hand washing, using sanitizers, using masks and social distancing. That is the only way to prevent transmission. Thus, people who use public transport will be reluctant to move out and travel fearing crowded public transport. Such a situation will make public transport system economically unviable as they have to cancel schedules or run trips with below normal passenger levels.
This will have a cascading effect as some trips will be regularly stopped or cancelled because of below optimum number of passengers. It will result in an erratic public transport frequency and finally ends up in distracting people from travelling frequently because of uncertainty. The impact of it will create two probabilities. One is that, people will have to wait indefinitely for public transport and they are likely to get into the next available one without maintaining social distancing norms. Second is that, people may cancel their travel and go back home. In short, predictability of public transport will be lost and travel become a tedious exercise as the optimum waiting period shoots up. Such a situation will act as a trigger to worsen the existing economic crisis further as it affects the economic viability of the entire public transport system and reduce the opportunity for common people to travel. In brief, the problem may look simple but it will have a cascading effect on the economy, if it is not addressed imaginatively and innovatively.

1.2 PROPOSED SOLUTION

Our aim is to develop an **Intelligent Post Lock down System for Public Transport which is Demand-Driven and Predictable.**

Maintaining the social distancing is of paramount importance by regulating the frequency of buses, trains and metros properly. Public transport needs to be operated at optimum capacity with social distancing norms. The transport authorities have to integrate its activity by a demand-supply driven approach so as to make their business economically viable and at the same time conducive for passengers to travel with comfort and safety. Here the travelers can book their journey well in advance or gathering information about their next available public transport facility and make their journey more predictable. In such a scenario, the public transport will develop a predictable pattern to schedule viable trips and make their system streamlined to address passenger's delight. On the other hand, their core issues of economic viability will be properly taken care of. By facilitating these two aspects of the problem, it is making public transport more fashionable and adapted to the times. Also in the process, it indirectly contributes to revive the economy for the better.

FEEDBACK AND ANALAYSIS

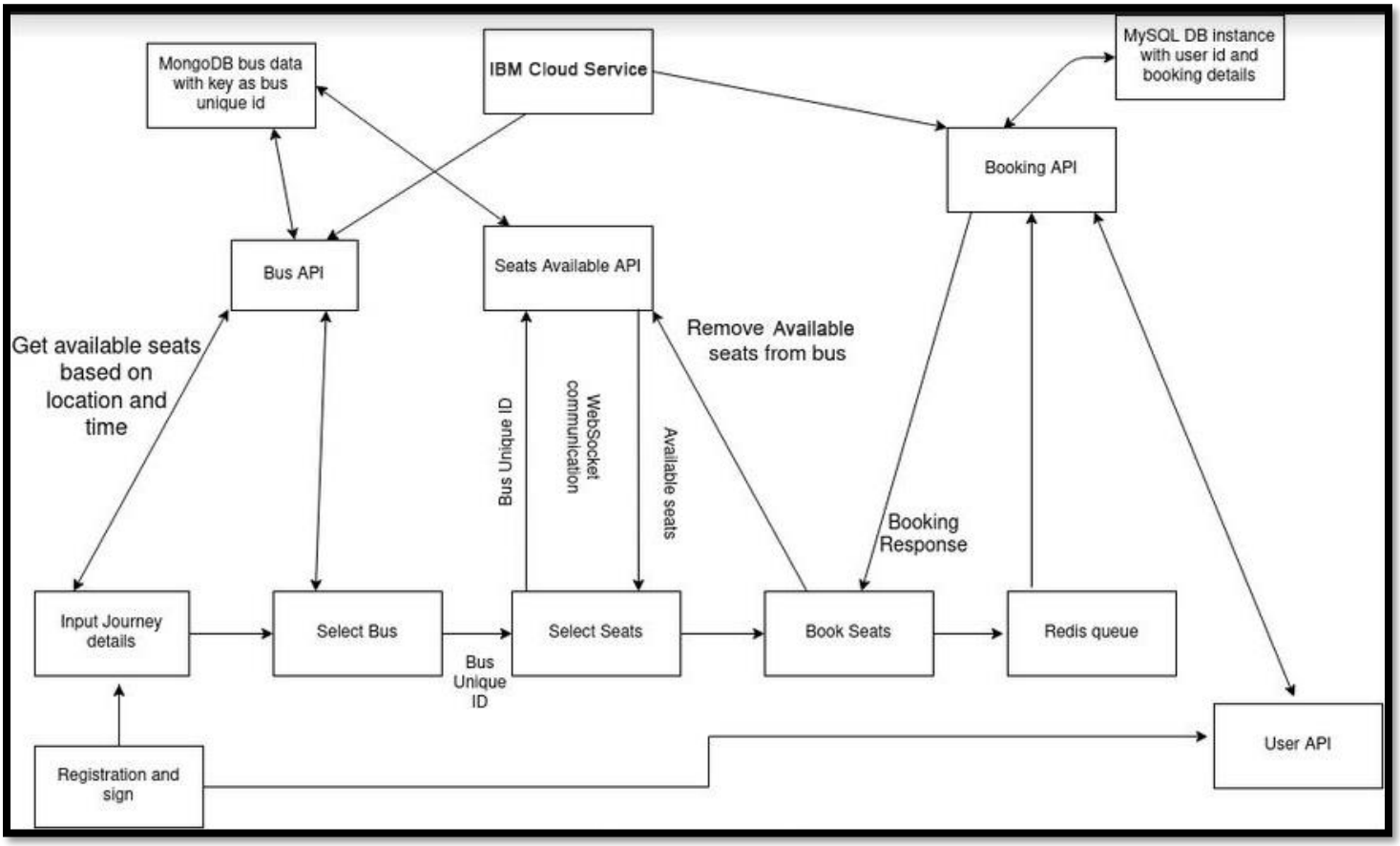
3.1 CREATING A PROTOTYPE

Enhancing clarity in developing a navigation path for technological execution is pivotal so as to facilitate developers to go ahead with spontaneity and precision. Developed prototype can be used as a reference material so that the process can be standardized. In short, it will reduce confusion and suitable UI themes can be identified.

Prototyping helps us analyze and evaluate the user experience and user interaction to a greater extend. There are many software supports provided at different platform to enhance the UI/UX designing. Our purpose could only be served by a designing tool which has access to smooth collaboration of the team members, quick sharing and enables real-time feedback.
Prototype design tool also needs to have features with technological edge in terms of innovation, which also should incorporate import and export options.

3.2 DESIGN FLOW

Mapping all the learning and incorporating the same into the design-flow.



CLIENT SIDE DEVELOPMENT

4.1 ANDROID APP DEVELOPMENT

Everything in an application or a web application that creates a visually appealing, functional and helpful applications that takes place on the client (end user device) is called client side development. This includes what the user sees such as text, images, and the rest of the UI, along with any actions that an application performs within the user's browser.

The prototype which is build earlier for this project will act as a reference layer for development. It makes sure that the codebase functionality meets the requirement of the user interaction.

1. Enables users or travelers to post their date and time of journey, pick up point, travel destination, etc.
2. Getting confirmation from the user
3. Transferring data to the Transport company to fix viable routes
4. Getting confirmation of date and time from the travel company.
5. User making payments
6. Giving confirmation to users or travelers regarding their ticket number or the coupon number, Vehicle Number, time and date of journey, probable departure, arrival time at destination and PREPAID OR POST PAID status – if payment option is provided.
7. Rating the App.
8. Asking residual users to seek optional convenient timing for travel, based on the next viable timing.
9. Repeating the process to see if the last user is given acceptable options.
10. Option to book for a week or a month with travel concessions or with some privileges.

SERVER SIDE DEVELOPMENT

5.1 API

This is the hidden layer of the development compared to front-end or client-side development. If an application is expected to meet the requests made by the user, then, its delivery has to be ascertained at the development stage itself.
This development mainly focuses on retrieving data from a database and displaying it in a page or an application, validating entered user-data and saving it in a database, checking user permissions and login users, etc. are the operations performed in server side.

With Firebase server support we can query our requests and retrieve data to our application.

TESTING THE PRODUCT

Our Testing protocols includes :

Functional Testing –
-- Identification of functions.
-- Data input and entry.
-- Execution of the test case.
-- Analysis of the actual results

Usability Testing –
-- Develop testing strategies that ensures all functions of our application get scrutinised. This includes navigation and content.
-- Recruit test participants, either internally or externally.
-- Run the test under the observation of experts.
-- Analyse the results and improve our application accordingly.
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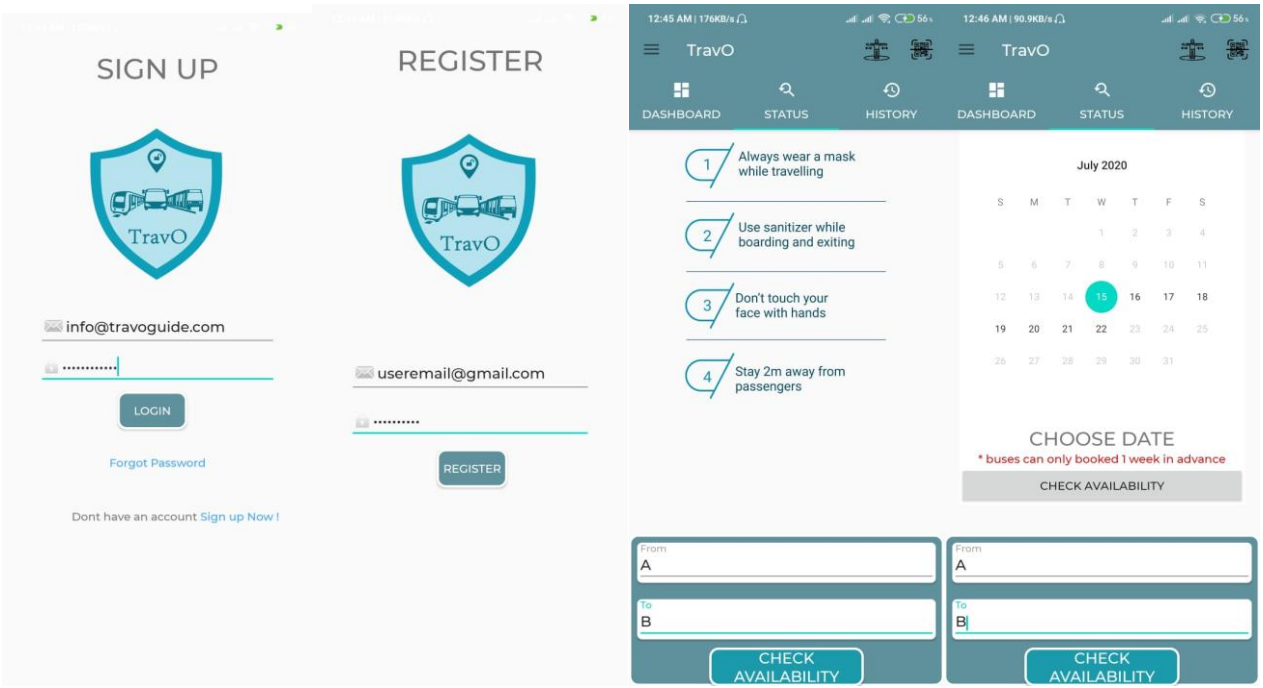
Interface Testing –
It makes sure that the server and the user are communicating smoothly.
Compatibility Testing –
It is compatible to different devices and scales properly on varying screens.
Performance Testing –
This includes testing the application under different internet speeds and how it behaves under normal and peak loads (load testing). To determine the breaking point of our application, it is put under increasing amounts of stress until it ceases to function (stress testing).
Security Testing –
Test whether secure pages can be accessed without authorization
Check that open sessions are closed after ongoing user inactivity
Verify the application's SSL
Making sure that restricted files cannot be downloaded without proper authorization

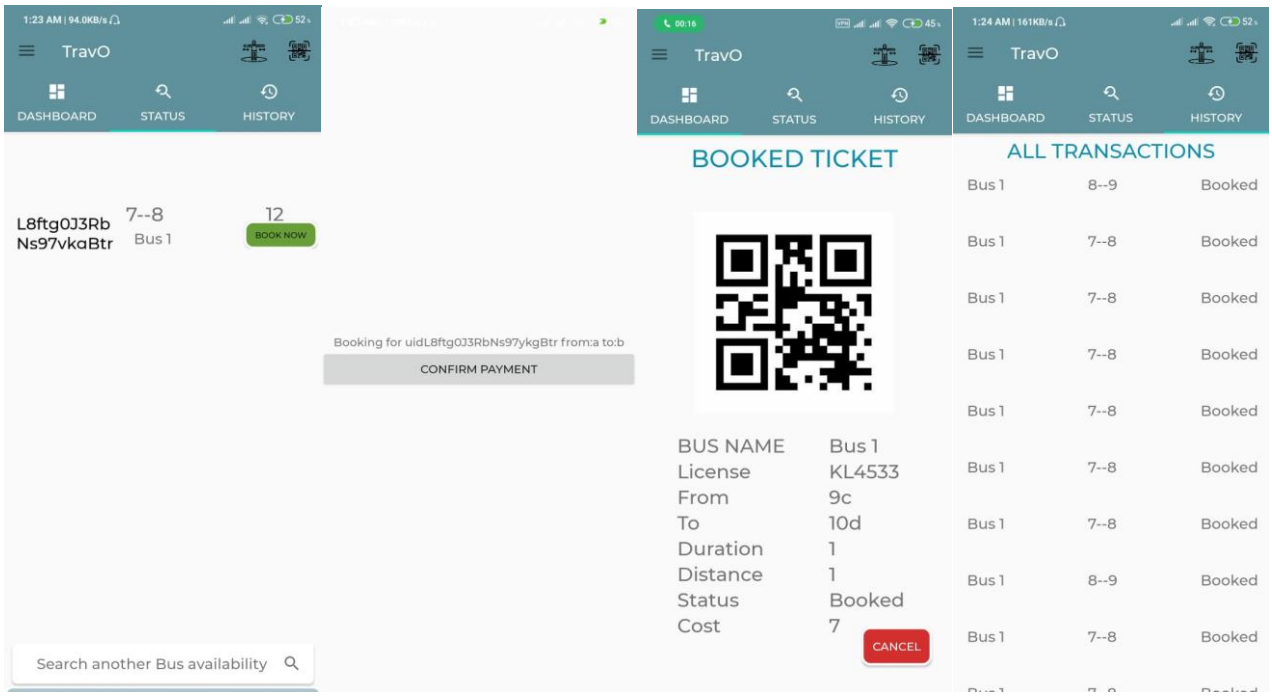
Security testing checklist makes sure that tasks like:

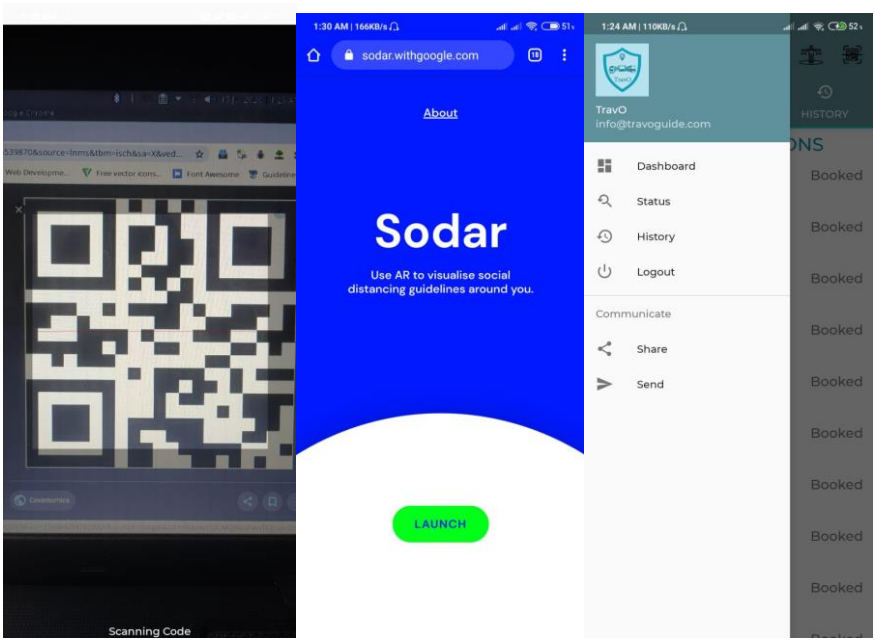
- Secure Transmission
- Authentication
- Session Management
- Authorization
- Cryptography
- Data Validation
- Denial of Service
- Specific Functionality Tests
- Error Handling

RESULT

Client Side :



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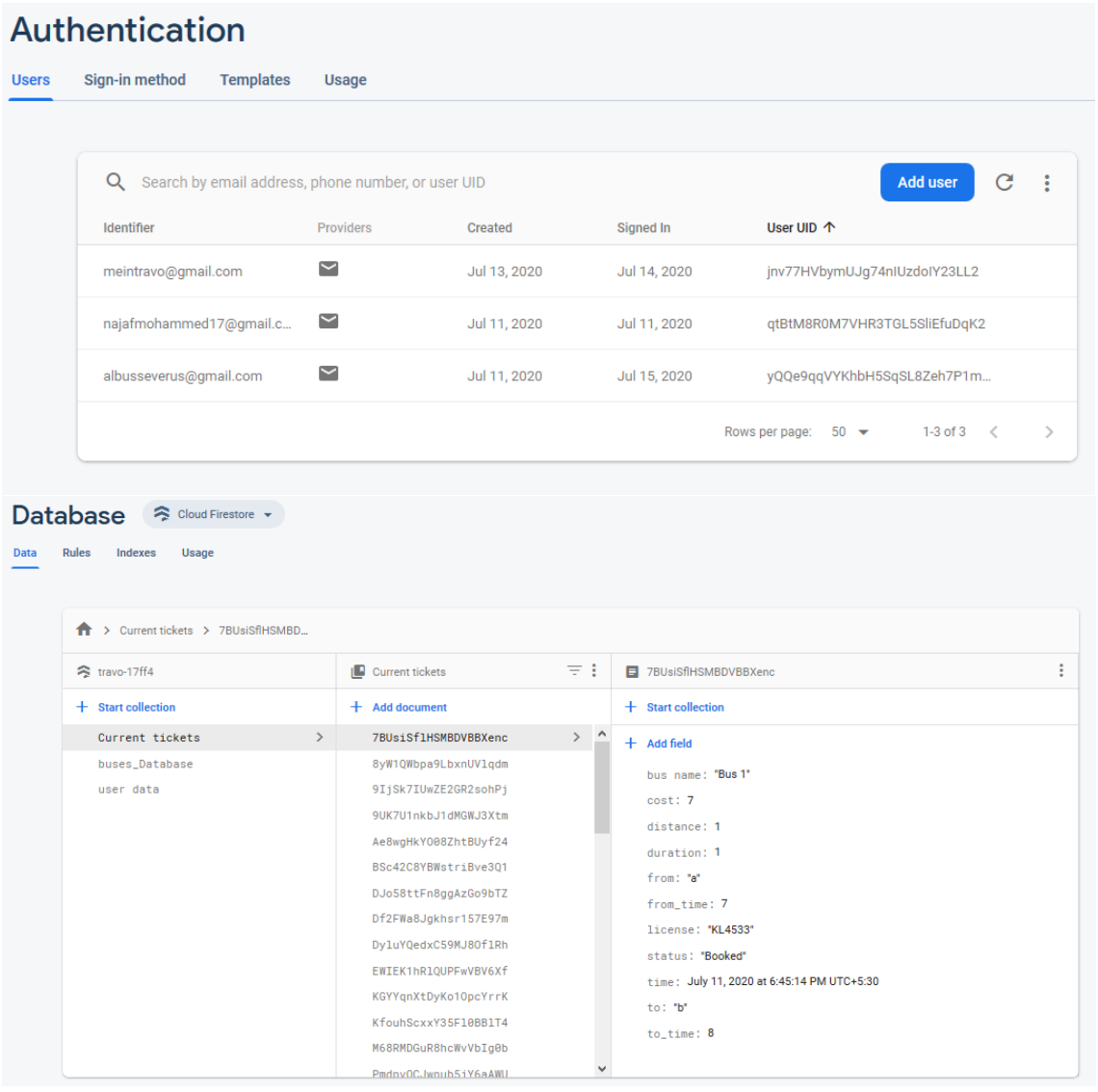
Server-Side :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CORE OF THE APPLICATION

1. Over occupancy or less occupancy of public transport can be mitigated.
2. Unnecessary crowding at stations (to avoid social distancing).
3. Enhances user experience, by reducing total travel time as the waiting time is optimised.
4. Economic viability of public transport system.
5. Encourage people to use public transport.
6. Develop scientific data of people who travel frequently.
7. If prepaid facility is provided, it will avoid customer- conductor 'touch points,' which is crucial in managing post Covid19 period by social distancing.
8. Uncertainty in travel will be reduced on both ends.
9. Reduces pollution as a small part of vehicle owners will prefer to opt for public transport as there is comfort, convenience and less crowd in the new system.
10. Make the public transport to forecast travel requirements scientifically and make them resourceful to design viable travel route based on empirical data.

CONCLUSION

- Addresses social distancing issues to a great extent and a few concerns of Covid19.
- Avoid over-crowding at the bus stops
- Contract tracing of commuters will be made possible
- Satisfying demand appropriately.
- Facilitates both the passengers and the public transport facility.
- Becomes an ALL-IN-ONE booking solution system for region specific public transport.
- Reduces transmission of Covid19 and other communicable diseases
- Enhances confidence of passengers to travel by public transport
- Improve economic activity as people feel free to move out
- The public transport need not run at a time when there is no demand.
- The people doesn't have to crowd at the bus stops.
- The public transport can work efficiently.
- Most user friendly approach that suites both passenger and transport system.
- Reduce pollution as people who use own transport will get attracted to subscribe this.
- Gathered commuter's data will be useful for Police for their investigations

FUTURE SCOPE

- Booking can be made available via a toll-free number.
- The payment of the booking done via toll-free number is done when they get inside the public transport.
- Contract tracing of commuters will be made possible
- Gathered commuter's data will be useful for Police for their investigations
- If there is no public transport running at that time, and suddenly if the demand rises, then the public transport can be made available to that route at that particular time.
- We are expecting to plan if the demand of a route rises at the optimum level, then they can travel at an immediate course of next 2 or 3 hours.
- The information will be updated in the same way to the passengers.
- If the demand is less than the seats in the normal public transport (bus, train, metro's), then we are trying to include small seater public transport to cater to such demands to optimize costs. (mini bus, small tempo's in case of road transport and others). It will also increase the revenue for the operator.
- The transportation booking facility is in the ratio of 3:1 for online booking and immediate passengers respectively. Now, the ultimate crowd-management lies in managing the 25% of the immediate passengers.
    - Each bus stop / station will carry a QR code.
    - The immediate passengers can scan it, to obtain tickets.
    - If the ticket is obtained by the above method. Then the application updates the respective seats. Hence, those who are planning to leave house for a particular time can stay at home and reduce public exposure.

BIBILOGRAPHY

Student Information :

Names : Najaf Mohammed, Anandakrishnan GM, Sanju Thomas and Janus Jerom.

College : College of Engineering Adoor. (Pathanamthitta, Kerala, India)

Worktitle : TravO.

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Testing the Application.

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APPENDIX

SOURCE CODE:

Github link:

https://github.com/SmartPracticeschool/SBSPS-Challenge-3595-TravO

THANK YOU