INTRODUCTION

- **Overview**

  A smart web and mobile-based application countering the intractable problems of transportation and traffic-management arising post lockdown raising.

- **Purpose**

  To provide a solution to all the traveling and other related problems during these pandemic times.

LITERATURE SURVEY

- **Existing problem**

  Post-Lockdown, it will be risky to allow the public transportation without the proper mechanism to maintain the social distancing, especially the frequency of buses, trains, and metros shall be managed properly to utilize the capacity with social distancing criteria. The transport authorities must integrate together to maintain the system properly.

- **Proposed solution**

  We propose an application which addresses some of the major problems on and off the problem statement, for smart traffic management and easy inter-territory transportation. Below are some basic points portraying the features the application would consist of-

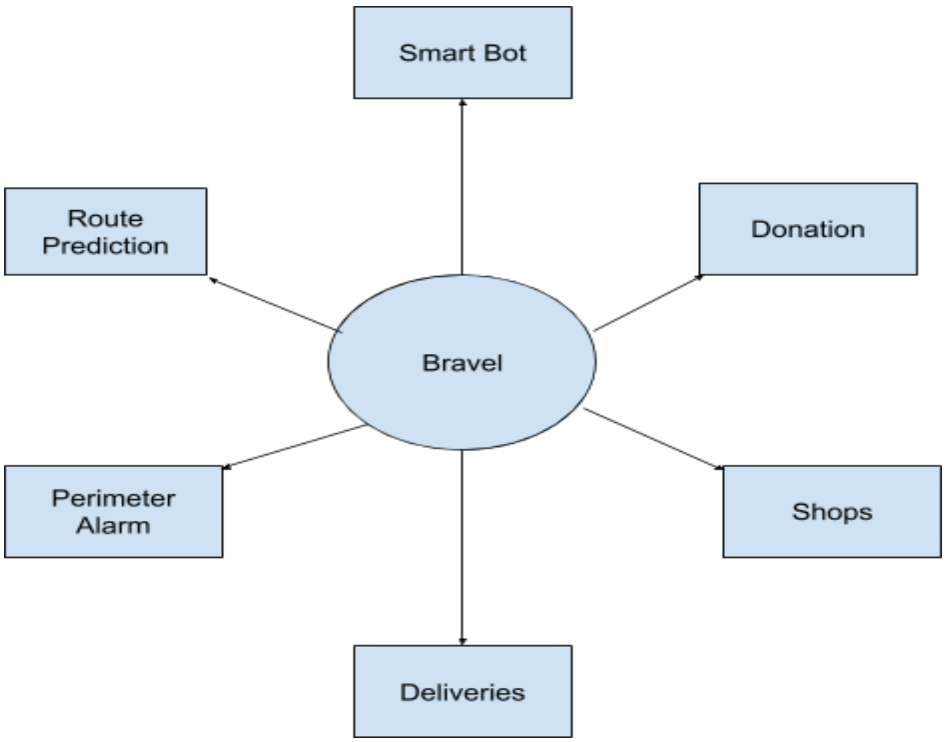
- Making known to travelers the various COVID'19 hit places en route their destination via Maps or other similar technologies.
- A smart scheduling cum reservation system for managing ticket booking and allocating a definite departure time, for buses and metros, to people before-hand, for avoiding their assemblage at the bus stops or the metro stations.
- An app or message-based notification system for informing people, when the seating capacity of a particular mode of transport, gets completely filled up.
- Maintaining a specified number of seats for emergency passengers in buses and metros, in case an urgent situation arises, and making their bookings available in a smart and interactive way.
- Notification based system to prevent masses from over-lodging into escalators or similar places.
- A redressal system for reporting convicted un-sanitized public places or people not following norms.
- A smart-route prediction system working on past traffic movement records, to foretell a better path.
- A system for reporting people intuited of having contracted the virus, for the general public.
- A smart alert system to indicate it's users, excessive crowd accumulation, at a particular spot on their

route, showing a prescribed speed for them to travel to allow the traffic clear-up before they reach that particular spot, in times another route to the destination is not available. (Leveraging sound-based technology for two-wheelers)

- Predicting the least huddled shops and facilities en route a journey to people.
- Analyzing past records and showing the least taken mode of travel to people going from a particular place to a particular place.
- Implementing a smart payment feature for online cashless payments and a credit-based pre-payment system authorized by the concerned officials.
- Making an alert system and a notification system via SMS or social media direct messages regarding updates on transportation.
- Analyzing real-time data to find out the best train or flight routes, depending on the number of exposed locations it passes through or has stoppages on.
- Facilities for travelers, midway their journey, for the event of an emergency occurrence.

THEORITICAL ANALYSIS

- **Block diagram**



- **Hardware / Software designing**

  Currently, we have planned to build a mobile as well as a web application for which we plan to use the MERN stack to develop the front end and backend, additionally, if features demand better use then use of Django or Flask framework can be used with a suitable and simple user-friendly frontend for ease of access. For predicting the crowds and best routes we plan to use the GPS and GPRS data to fetch location details of users with mobile phones to predict the gathering of the crowd at any particular location. For deploying and transparent usage of the application we plan to use IBM Cloud deployment infrastructure. For all the scripting and processing stuff, we aim to use Python 3 for the operations. We also aim to build an interactive support system using the IBM Watson assistant and also using the various tools of the IBM Watson Studio for implementing the predictive analysis and machine learning algorithms as and when required.

EXPERIMENTAL INVESTIGATIONS

1. **Book Your Transport**

- The destination point should be selected by entering the location on the search box or by manually selecting it from the provided map.
- The pick-up point from where you need to board the ride can be selected.
- Group travelling feature can be availed by clicking on the Group travel button, from which either of the three options can be selected based on the requirement of the traveller.
- Rental service can also be availed based on the personal preference of the traveller.
- Preferred mode of transport can be chosen between the different modes available.
- The app will find the best suitable route based on the preferences made by the user, and will lead on to the page of payment
- Payment can be done both online as well as offline based on the resources available at the providers' end.

2. **Remote grocery and other trading services**

- Users can buy or sell items they need with this feature from one to another seamlessly.
- Image of the product, proposed selling price, and all other details can be provided to list out an item in the selling section.
- Similarly, buyers can provide their location and other details required to make a successful trade.

3. **Smart Transportation Bot**

- Users having difficulty in using the app properly can interact with an in-built bot implemented within the app, to find out more information related to specific services offered.
- Several features of the app such as making payments can be done directly through the bot by just typing some simple messages.

4. **Donation**

- People willing to donate goods can make their contribution through this app with the help of the donation feature provided on board.
- Items available for donation can be listed out on the donation section of the app and on making successful donations, several rewards can be earned in the form of virtual credits, which can be further used in accessing other features of the app.

5. **Shops**

- Various shops hit by this pandemic conditions can register themselves on this app and can expand their business
- People can register themselves as delivery agents and earn some handy money during these times
- Shops can be registered by providing certain documents and thereby start doing normal business.
- Customers can find shops related to specific products by clicking on the Find Shop button.

6. **Perimeter Alarm System**

- Users can avail the app's this feature to guard themselves against people coming too close to them enroute their destination by ringing the buzzer alarm.

7. **Exposure Control**

- People can control their exposure to the public using this embedded feature of the app
- This system notifies users if they cross a certain limit of predefined interactions with people or covers more than a preset distance.

RESULT

The resulting solution meets all the points it aspired for and thus provides us with a working 24*7 assistant for all our commotion related queries.

ADVANTAGES

No other web-based app until yet, has been launched, to tackle the several different problems arising post lockdown lifting, keeping in view the social distancing norms. Our presented application addresses issues right from national-level movement to inter-city level motion. It provides solutions from every individual aspect, one can think of. Below are some points to show it's uniqueness-

- Bordering out the virus hit places on maps would help people take precautions before-hand.
- Buses and metros can preset a definite number of seats respectively for helping passengers follow social distancing norms inside them.
- A pre-kept number of seats for emergency travelers would make sure people do not lose out on anything in times of urgency.
- Capturing location data from travelers and analyzing them to find out the best possible route and mode of transport together with the real-time data would make sure, the system is efficient and proven.
- Sound-based navigation would help two-wheelers stay protected by showing them the best route to their destination.
- A system for reporting COVID suspected people would help in the betterment of them as well as the general public.

APPLICATIONS

Our solution provides the following applications-

- Post Lockdown lifting, it may become difficult for people to continue staying contained inside their homes as they are now. Our application would make sure that people are able to easily commute to their favorite destinations, and follow the basic social distancing norms at the same time, thereby helping serve them while also they are being protected.
- Businesses impacted due to the unavailability of proper routes through safety, to people, would be able to function unanimously all over again.
- The feature that searches the best mode of transport for a particular route will help every commodity make an equal amount of business and prevent people from stacking up together.
- The emergency feature would help fellow volunteers earn some money at the same time as the other person gets helped.
- A proper rewarding system would help people report suspected COVID contracted cases more easily leading to a safer environment for everyone tomorrow.

CONCLUSION

We successfully address the existing problems with this all-in-one stop solution app. Our this application provides all the features it claimed for, having integrated with great precision as a

countermeasure for all the traveling related problems arising out due to the ongoing pandemic.

FUTURE SCOPE

Later we aim to add an extended feature for the application users' to record from their responses the worst-hit businesses to draw out a common conclusion depicting the severity of the impact the virus had on different professions.

BIBLIOGRAPHY

For making of the project help from following sources were taken,
https://royalsocietypublishing.org/doi/10.1098/rsos.150162
https://www.sutp.org/publications/standard-operating-procedures-sops-for-bus-transport-post-covid19-lockdown/
https://timesofindia.indiatimes.com/india/govt-prepares-post-lockdown-norms-for-use-of-public-transport/articleshow/75544877.cms

APPENDIX

- **Source code**

  All the source code of the project are hosted in Github and are available here,

https://github.com/SmartPracticeschool/SBSPS-Challenge-4514-Intelligent-Post-Lock-Down-Management-System-for-Public-Transportation