VIRTUAL AUTO STAND

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Abstract: **With increasing development, the number of daily commuters in our country is increasing rapidly. This has led to a rise in the demand for public and private transport services. Although there are a lot of options available like buses, metro, cabs etc., the most preferred choice is Shared Auto Rickshaw, due to some main reasons- availability/accessibility,affordability, connectivity, comfortability, time saving. This justifies the importance of Auto Rickshaws in our daily commutations, even more for persons who commute around a fixed route. The busiest stands are the ones which are just below the metro stations and are almost unavoidable, even for an occasional person. In spite of knowing it's importance, we still lack a good Shared Auto Management System for Temporary Auto Stands. People still have to wait for long hours to find their turn only to be disappointed to find within the timeframe which leads them to become a latecomer and sometimes they don't even get their rides at all. Although some works were done to manage the auto stands, there are some limitations to them, such as high expenses, less availability, poor time management, undesired routes etc. We seek to provide a solution to these problems by developing a mobile application, which will allow users to book their seats in the autos ahead of their arrival time, at an affordable price, to save time and money. The users will be provided with a list of the current schedule of the autos at different(fixed) routes along with their respective fares and many other features.**
Keywords: Commuter, Auto Rickshaw, stand, importance, mobile application, seats, routes

I. INTRODUCTION

SHARED AUTO-RICKSHAW IN INDIA:

The usage of shared three-wheeler auto-rickshaws for daily commutation has now become a daily activity in the lives of people in urban cities. Although there are multiple options for shared vehicles such as buses or cabs, commuters prefer to travel in auto-rickshaws as they provide better mobility, reasonable fares, last mile connectivity and take less time to reach the destinations.

Auto-rickshaws save a lot of time and energy of thecommuters.

Fig. 1.1- Three Wheeled Auto-Rickshaw

The domestic sales during the years 2018-2019 saw around 10% growth in units from635,698 units in 2017-18 to 701,011 units in 2018-19,mainly because of hike in demand of auto-rickshaws in cities due torise in population.

A study in India [by Majumdar and Jash, 2015] had shown that in just one decade, there was a double-digit growth in use of auto-rickshaw by people and considerable decline in the use of buses and railways.

Even though autos play a major role in daily lives of commuters, there is one major problem that people generally overlook which is- finding an auto rickshaw at the right time, at the right place and also with passengers going in the same direction/location. Due to this issue, people sometimes reach their destinations later than expected. It is not that there are not the required number of autos present to accommodate people, for instance, there are always auto drivers waiting for passengers to board at almost all of the public places, it is just that there is no

dedicated method that can make this process seamless, passengers have to wait for other passengers who would go in the same location or direction as they are going, which sometimes takes even hours to find. It is a problem which might sound trivial but is a major issue for almost all daily commuters, and is yet to be dealt with.

With the help of thispaper, we seek to provide a solution that can solve the problems associated with shared auto travel. Our solution is to develop a mobile application for all smartphone devices, which would allow its users to book their seats in an auto-rickshaw from their devices, without actually being present at the pick-up location i.e., before reaching their pick-up points. It is just like how you book your seat in theatres these days. Just like in theatres where people who want to watch a movie of common interest book their individual seats and share a big screen together, the passengers who want to travel to same direction or locations can book their seats and share a common auto for their travel.

Fig. 1.2- A shared auto-rickshaw hotspot

OUR VISION:
To get the shared autos and the large number of passengers on the same platform through our mobile application and provide a more time efficient and **seamless** on-board experience and providing last mile connectivity between various transits having **Temporary Auto Stands**.
To provide online seat booking system in an auto rickshaw so that the passengers don't have to wait endlessly for their turns and don't get the tag of late comer just because of time wasted in this unorganized sector.
To provide a list of available autos and their respective departure time to help passengers select their rides at times that suit them best or they can setup a **quickbeacon (Virtual Auto Stand)** which will help them to create a temporary auto stand. As this will provide the user the flexibility and benefits of a shared auto as well.

II. LITERATURE REVIEW

All the reviewed literatures describe the existing systems and the problems that we have to overcome. Some of them are discussed here:

M. Shafiq-Ur Rahman, Paul Timms and Francis Montgomery This paper has emphasized on integrating BRT (Bus Rapid Transit) Systems with Rickshaws to solve daily life problems such as congestion on roads, convenience to customer, cost and time efficiency. It has also emphasized on the need to design and implement such systems.

Our take from this paper is that we need to keep in mind some complementary transport options while choosing routes during our project.

Subhashree Natarajan and T.K.T Sheik Abdullah This paper describes the challenges that occur in the society due to poor management and tracking of the Auto-Rickshaw drivers in India and the role of Social organisations in overcoming it.

Our take from this paper is that we need to manage the auto drivers who register in our app properly.

Deepanjan Majumdar and Tushar Jash This paper discusses how e-rickshaws can be used as an alternative public transport system due to its merits. e-rickshaws need to get the attention that they deserve.

Our take from this paper is that we should also include e-rickshaw service on our app for economical as well as environmental benefits.

Megha Kumar, Seema Singh, Akshima T. Ghate, Sarbojit Pal and Sangeetha Ann Wilson This paper describes the importance of informal public transport services in meeting public demand. This paper also argues about the misconceptions that are associated with informal modes of transport.

Our take from this paper is that we should formulate strategies that can help us improve the service performance.

Deepa Sharma, Debapratim Pandit and Tiyali Bose This study provides the basis of selection of paratransit service quality attributes in case of developing countries for future researches.

Our take from this paper is that we need to determine service quality attributes based on user's perspective.

Sanjay K. Singh This article provides an overview of urban transportation in India and its issues. It also proposes some policy measures to improve urban transportation in India.

We learn from this paper that not everyone in Indian cities can afford to travel in private cars and two-wheelers and we need to acknowledge the fact that a policy should be designed to encourage the usage of public transports over personalized vehicles.

John Pucher, Nisha Korattyswaropam, Neha Mittal, Neenu Ittyerah This article summarizes key trends in

India's transport system and travel behaviour, analyses the extent and causes of the most severe problems and also recommends 9 policy improvements that would help in reducing Indian urban transport crisis.

With the help of this paper, we found out the major reasons for transport crisis in India and also some methods to overcome this problem.

Anindita Ghosh, Kanika Kalra This paper focuses on the importance of Intermediate Public Transport, the problems this sector faces and some some suggestions to improve this sector efficiently.

Through this paper, we learn that Auto Rickshaws play an important role in our country in terms of travel but are often neglected by policy makers due to their unorganized nature.

T. Shimazaki, M. Rahman This paper summarizes the physical characteristics of different paratransit modes in the cites of developing countries in comparative forms, in order toprovide a basic data for discussion of urban transportation issues.

Dr. Ashok Kumar Panigrahi, ShambhaviShahi, AmarsinghRathore This paper is the success story of an Indian startup, Ola Cabs. The marketing and promotion strategies adopted byOla Cabs is discussed briefly in this paper.

III. OBJECTIVE

Our objective is to develop a mobile application for shared auto stands that are **Temporary (Halt & Go)** in nature, and to organize the commuting process, so that we can deliver a time efficient and seamless on-board process for our users as well as for the local auto-drivers.To get the shared autos and the large number of passengers on the same platform through our mobile app.To provide online seat booking system in an auto-rickshaw so that the passengers don't have to wait endlessly for their turns.To provide a list of available autos and their respective departure time to help passengers select their rides at times that suit them best.

IV. VAS

VAS(Virtual Auto Stand) is a mobile application for shared auto stands that are **Temporary (Halt & Go)** in nature, and to organize the commuting process, so that we can deliver a time efficient and seamless on-board process for our users as well as for the local auto-drivers. The main functions of the VAS areto get the shared autos and the large number of passengers on the same platform through our mobile app,to provide online seat booking system in an auto-rickshaw so that the passengers don't have to wait endlessly for their turns andto provide a list of available

autos and their respective departure time to help passengers select their rides at times that suit them best.

The application of the project is powered by **Flutter**, an open-source UI development framework created by Google. It is used to develop mobile applications for Android as well as iOSfrom a single, common code.

The Commuting Dilemma (Public conveyance)

Millions of people commute through shared autos every day. The mostly busy are the stands just below metro stations.No one can ignore the hassles to sit in overloaded shared autos or for the long waiting queues for auto to fill up.Sometimes the vehicle even isn't available at the need of the hour.

Growing population and urbanization have caused an escalationin the need to travel. Auto rickshaws have always had a central role in the transportation in the urban area and are common among both men and women due to its cheap, quick and personalized service, end-to-end connectivity and they are used for the first and last-mile approach. The mostly busy are the temporary stands just below different transits and concourse of metro stations.No one can ignore the hassles to sit in shared autos and wait for the long waiting queues for auto to fill up. Only to realize that you are going to be late for your work due to unorganized and time-consuming process at these temporary auto stands.
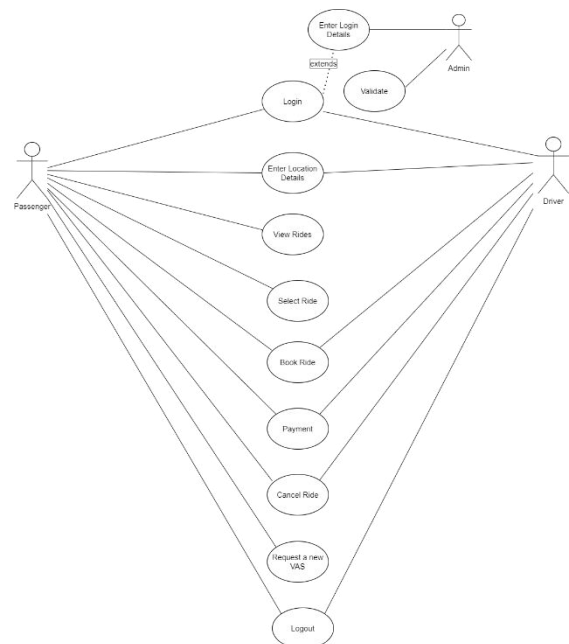
V. PROPOSED WORK

Figure 5.1- Use Case Diagram

The implementation of the VAS app is as follows:

1. The VAS mobile application will be developed using flutter, which is an open-source UI software development kit created by Google and is used mainly to create Android and iOS applications[1].
2. The code for the application will be written in Dart, an object-oriented programming language developed by Google[1].
3. The Dart language uses C style syntax and can compile to either native code or JavaScript.
4. The VAS is supported withfirebase.
5. Firebase is a backend as a service that provides variety of tools to create mobile apps[2].
6. Firebase is a NoSQL database program and it stores data in JSON-like documents.
7. The VAS app will use some dependencies on the user's mobile phones such as GPS, to work efficiently.
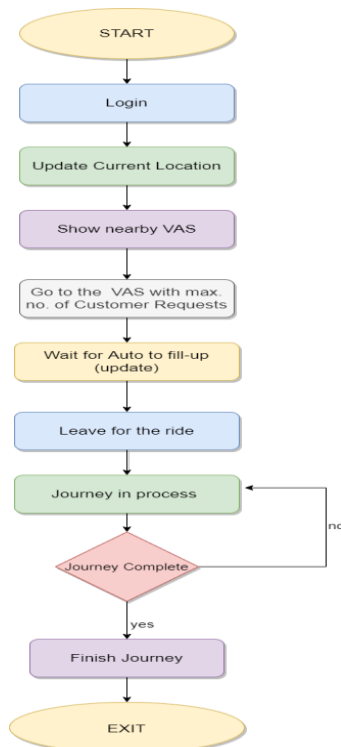8. The VAS app will be available on Android and iOS devices.

A. DRIVER:

Figure5.2- Flow Chart for Driver

1. The driver will need to login into the VAS app by entering their details.
2. The driver will update their current location on the VAS app.
3. If the driver is doing rounds of the same route, then they will need to specify the pick-up point, destination and the checkpoints locations between the two.
4. The driver will fix the fare, max. no. of passengers and finish creating the ride.
5. The driver will have to wait for the passenger to arrive and fill up the auto.
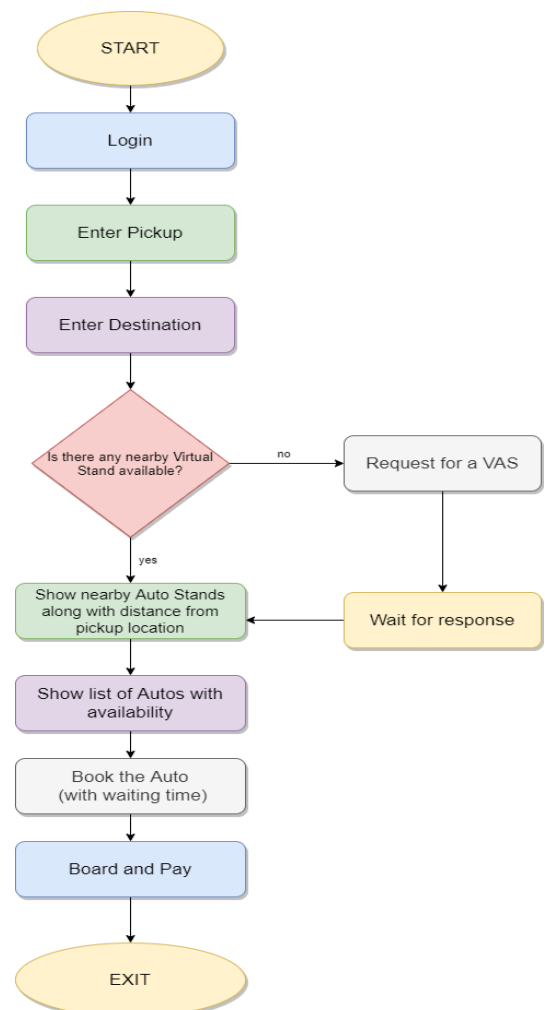6. Complete the journey.

B. USER:

Figure5.3- Flow Char for User

1. The user will log in to the VAS app by entering their details.
2. The user will set the pick-up and drop points on the VAS app.
3. The app will show the nearest virtual auto stand available to the user. The user can choose that or may request for a new VAS.
4. If there is not any VAS present currently, the user can request a VAS to a nearby auto driver and wait for the response.
5. The VAS app will show a list of all the autos which are currently available for booking along with their details (fare, route). The user can select their rides accordingly.
6. The user will book the ride and complete the payment process.
7. The user will board the ride.

Some screenshots of the VAS app are shown below:
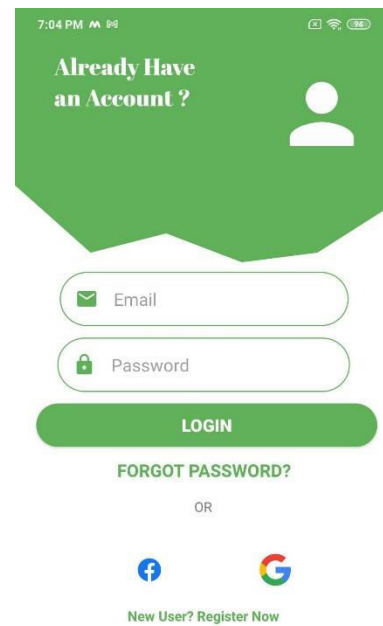
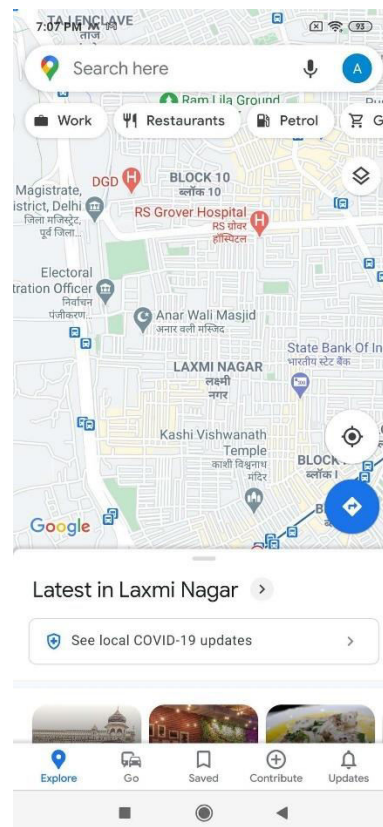Figure 5.4- Splash Screen

Figure 5.5- Login Screen

Figure 5.6- Home Screen

VI.   COMPARATIVE STUDY

The existing or previous solutions have some limitations:

1. The previous models are more focused on personal trips and not on public transport such as shared autos.

2. Not everyone prefers to use private cabs over shared autos for commutation as they are sometimes over the budget.

3. Sometimes the driver doesn't agree to drive to the passenger's destination or the routes are not always fixed.

4. In the pre-existing apps, the auto stands are not given much attention that they need, mainly because they are difficult to deal because of large number of persons involved, thus lack a good management system.

Our product will allow users to book their seats in the autos ahead of their arrival time, at an affordable price, to save time and money. The users will be provided with a list of the current schedule of the autos at differentroutes along with their respective fares, for routes that are already fixed i.e. marked as VAS (Virtual Auto Stand) can be used to commute directly. However, if a route is not fixed but has high number of passengers, then a VAS beacon can be deployed by creating a virtual auto station on that route. The nearby auto drivers will be able to observe the routes with the number of passengers and can serve accordingly.

It will also provide last mile connectivity based on the number of passengers.

VII.   CONCLUSION

This paper provides an introduction to VAS (Virtual Auto Stand), a mobile application for booking seats in shared auto rickshaws virtually before reaching the actual pick-up point. With the VAS app, people can book their seats without being physically present at the auto stand which will save a lot of time and will also reduce the hassle and long queues which are generally present at auto stands. As the name suggests, the VAS app creates a virtual auto stand of the temporary physicalstands at busy places such as metro stations, colleges, offices, etc., where the trip is usually between fixed routes, to help the daily commuters to book their seats in the autos quickly.The VAS app is a better option than the pre-existing ride booking apps as it provides booking at cheaper prices, saves a lot of time and provides a convenient way to manage the shared auto stand system, which is quite difficult to deal with. The VAS is backed up by firebase which is a back-end service provided by Google. Hence, we can conclude that VAS is a better approach in comparison to most of the already existing ride booking apps out there.

VIII.   FUTURE SCOPE

The future scope of the VAS is as follows:

1. Users will be able to book private/personal autos.
2. If there are two or more people on a location who want to go to the same destination, then they can create their own temporary VAS for that trip and fare can be decided accordingly.
3. Other modes of payments such as UPI will be added.
4. Premium membership will be granted to certain customers according to some conditions.
5. Auto drivers will be able to create their own VAS according to their requirements (fair, route, etc.).

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