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Vehicle Tracking and Seat Reservation System Using Android Smart Phones

Sharan B V[1], Vishal C[2]

Student, Department of MCA, Rashtreeya Vidyalaya College of Engineering, Bengaluru, India[1]

Assistant Professor, Department of MCA, Rashtreeya Vidyalaya College of Engineering, Bengaluru, India[2]

ABSTRACT*:* Real time location tracking and seat reservation is the most significant and vital concept which are to be thought of and implemented on public transport, in order to urge individual to use public transport which are buses in this case. The reason being in this busy life style everyone will be in a hurry to reach their respective destinations. In such, case waiting at bus terminals without knowing the exact location and arrival time of bus is not acceptable. So, in this paper, we propose two different android applications namely driver Application and User Application.The driver application here acts as an GPS/GPRS module. This driver application by the GPS technology in smart phones will continuously receive the latitude and longitude that is the coordinates from satellite and then transmit them to Firebase which is the real time database is used in the system. Firebase will update the data within milliseconds and transmit the coordinates to user app continuously and is also used to send cloud messages to user regarding the arrival time of the bus at the users stop. The user can select seats and bus and track the real time location of the bus using the user Application.Thus, the created following framework gives increasingly efficient, speedy what's more, easy to use condition to the clients traffic issues in large cities can be controlled to some extent when more people start using public transport.

KEYWORDS*:* Tracking,Firebase, latitude, longitude, GPS technology,Android

I. INTRODUCTION

Real time location Trackingof buses is the vital step which is to implemented on public transport in order to urge individuals to use public transport systems. the main reason being people can track the location of their buses and plan their activity or can leave their homes at the exact time when the bus arrives to their particular stop which will save all important time of the passengers.

Vehicle tracking and seat reservation system is an android application which is developed to facilitate the users who wish to travel through public transport system especially in urban areas mainly due to the traffic issues the application can be used in rural areas as well. The application which is built enables the users to locate and to track the location and also the movement of the bus on the google map which saves all important and precious time of the passengers who wish to travel in public transport which is one of the major importance of the application which is built. This application can also be used to check the bus status. Along with this another importance or another part of the application is that reservation of seats can also be done. Which helps the passengers to pre- book their seats according to the availability of seats in the bus. By this the passengers can travel comfortably in their respective seats which were booked by them. This vehicle tracking and seat reservation system is developed using android because Android has turned out to be more prominent these days as it is open source and there are no additional charges for Java Virtual Machine (JVM). As the result there are new applications which are being built daily to develop many useful applications using android. Because of this utilization of smart phones are gradually increasing daily.

The main purpose of this vehicle tracking and seat reservation system is to provide a convenient and a bankable application to the passengers who wish to travel in public transport systems. By using which the users can track the location of the bus and can book their seats in which they wish to travel. Which will save the waiting time of the passengers and also seats must be available for every passenger who are travelling in public transport. Which will help encourage individual to switch to public transport when each and every facility are provided which will help in gradual decreasing of the traffic problems in the city. By which each and every individual indirectly can contribute to form a pollution free city.

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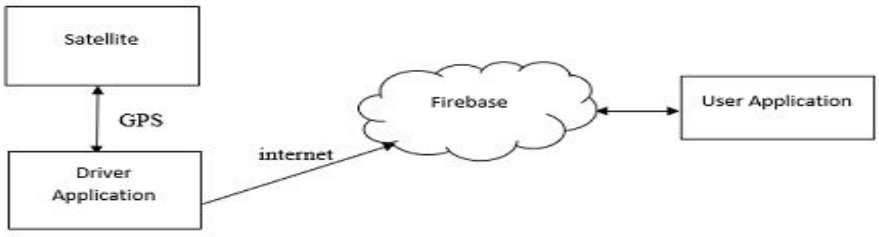

Fig 1 Block Diagram of Vehicle Tracking and Seat Reservation System

II. RELATED WORK

In [1] The authors explains about the technique of Mobile bus tracking the basic functionalities that are that are to be followed or included in that of the mobile bus tracking is explained by the author in this paper In this way the shrewd framework is important which gives constant data of transport to remote client. The authors here propose a framework which defeats the disadvantage of public transportation framework. The framework handles all the information about current area of transport and by utilizing this information the continuous following of transport is be possible and this data is at that point given to remote client who needs to realize the constant transport data. The principle favourable position of city transport driving is that it decreases the general contamination, diminishes the traffic on street, additionally the issue of stopping is settled partly.

In[2] This paper focuses on the time of arrival which is the key aspect as well as the most important component in Vehicle tracking system. Here the author explains on how the issues like traffic will influence the arrival time of the bus at any particular destination. Here the author discusses about negotiation of the issue which is caused by traffic and the difference in arrival time.

In [3] the authors focus about reservation of seats to the passengers. Seat reservation in buses is another significant and useful aspect which is to be developed for public transport systems. Buses are integral means of public transport in both rural and urban areas. This public transport will be used by millions on a daily basis to reach their respective destinations as per the expenditure on transport. The problems which arises now is the availability of seats. By using seat reservation users can check the availability of seats in the buses and can reserve their seats accordingly without any conductor intervention. This also this helps in e-ticketing which reduces excessive use of papers which were given as tickets. This ticketing system contains the information like destination, bus number, fare etc. which will be generated as a ticket digitally.

In[4] the author mainly focuses on firebase. Firebase is a Google's mobile platform which helps to build mobile applications. Firebase is a real time data base which is cloud hosted. Information is put away in NoSQL database and json position and is synchronized continuously to each associated customer. Firebase is Realtime database that is every time data changes the connected devices will get the updates within milliseconds. Firebase uses FCM (firebase cloud messaging) technology to send notifications to the client mobile phones. This cloud messaging is most powerful service which is used by the application developers to send notifications from cloud to the users. As firebase is a Realtime database this can be used to send notifications to any particular or a group of users who will need same type of notifications. Notifications here are sent by external servers to the gadgets on which the application is running. FCM sends the notifications to the devices on which the application which is connected to firebase is running. Firebase is designed to serve as an intermediate communication medium between the driver and the user application.

In [5] author explains about the need of bus tracking system. The main objectives of the application which are needed to looked into to develop an efficient and user-friendly application is explained in the paper.

In [6] the author explains about the how using GSM/GPRS modules to transmit data to database needs more maintenance and the cost of this is also, more so the author in the paper has proposed an idea about how an application can be developed which acts as a GPRS module.

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III. PROPOSED METHODOLOGY AND DISCUSSION

The Proposed methodology includesthe following applications and the technologies.

- GPS Technology
- Driver Module/application
- Firebase Technology
- User Module/application
- Google Maps.

GPS Technology- Global Positioning System GPS plays a significant role in this project. GPS is used to fetch the coordinates of the location which will be used to track the buses location in the entire project. This coordinates which will be received by GPS are then sent to the real time database which is firebase. GPS is a satellite navigation system using which ground position of an object can be determined. GPS satellite system comprises of 24 satellites at six earth centred orbital planes. Each with four satellites. Where three satellites are used to produce the location of the earth surface while the fourth satellite is used to validate the information which is produced from the other three satellites. This GPS was used earlier by US military in 1960's later this technology became wide spread and now is being used by millions around the globe. For various purposes like tracking, navigation, location etc.

Driver Application-This driver application is designed to receive coordinates from satellite and send them to the firebase. For this purpose, an android application is designed using android studio which is the official IDE(Intellectual development Environment) to build android applications to collect the coordinates from satellites. This application is to be installed at the drivers end with location and internet service turned on all the time to receive coordinates from satellite. The user of the application after entering all the necessary details needs to click on start service which will start to receive the coordinates and send them to firebase. Background tracking is provided in the application in case the user switches to another app coordinates will be received from background. User at any point of time can stop receiving coordinates by clicking on stop tracking button which is provided in the application. Flow chart of Driver Application is show in Fig 2.

Firebase-: In the project firebase technology is used as a back end. Here firebase is used to store all the data of the application and to send cloud messages to the users. Firebase also works as an intermediate between user and the driver application.Firebase is a platform which helps in development of both web applications and mobile application which is owned by google. This provides tools and services which helps in development real time applications. This provides back end and real time database as a service. Using firebase applications can be built at a quick rate with real time data update. Data will be stored in firebase in JSON format. Configuration of server in firebase is automatically done. Using Firebase saves time and will make the developer more productive as there is no server-side coding. Firebase is also used to send notification to the users regarding the arrival time of the bus which is done by FCM Firebase cloud messaging feature of firebase. Flow chart of Firebase is shown in fig 3.

Fig 2 Flow Chart of User Application

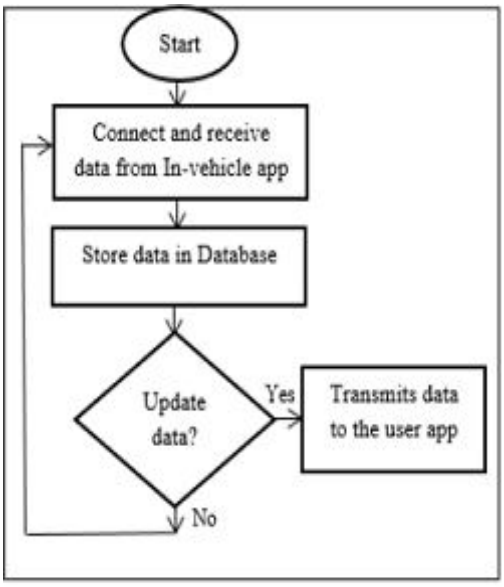

Fig 3 Flow chart of Firebase Technology

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User Application-This is the second Application which is developed using Android studio. This application is designed to serve at the user end. This application is integrated with firebase which shares the same database with thedriver application. user app is used to get the information of the buses. User needs to have internet connection to use the application. This application has two activities 1st to select bus and to book seats. The second one to locate buses on the map after booking of seats. In the 1st activity user needs to enter the destination where he wishes to travel in the search bar provided and the based-on availability buses will be displayed from which user can select the bus. After this from the selected bus user can select the seat of his wish and book the seat by the seat matrix which is displayed after the bus selection and by making the payment digitally user will get an E-ticket with all the necessary details available in it. The second activity user can track the movement of the bus on the google maps after booking of seats. Work flow of user application is displayed in the Fig 4.

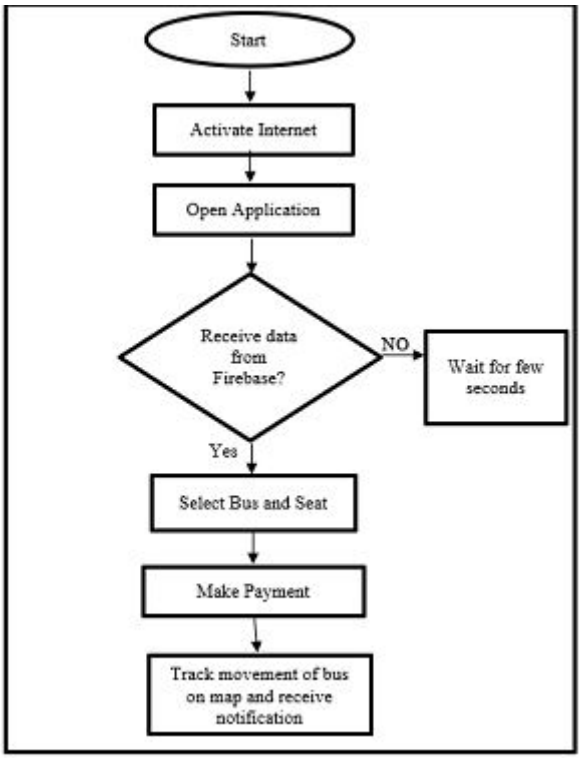

Fig 4 Flow Chart of User Application

- **Google map**- Google map is a software which shows 3D graphics of earth using satellite images. This was launched in 2005 It is a version of google earth which shows the map and can be embedded into web pages with the help of google maps API keys. This is also a service which offers web mapping and is developed by google. Google maps are used by many around the globe to find routes, for travel updates and the time required to reach the destination and so on. Google maps gives updates about the traffic conditions of any specific area of which the passengers wish to travel. Google map API for android by using the HTTP request displays the real time vehicle information of the user application. Setting up of Communication between the google maps and application is done by this HTTP. This HTTP is built in such a way that it makes this type communication possible. In this project Google maps is used to track or to watch the movement of the bus which is booked by the user on google maps this can be done with the help of GPS.

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IV. EXPERIMENTAL RESULTS

Driver Application- In order to Experimentally demonstrate the working of the driver application this driver application is installed in a smart phone and the blow screenshots shows the working of the driver application.

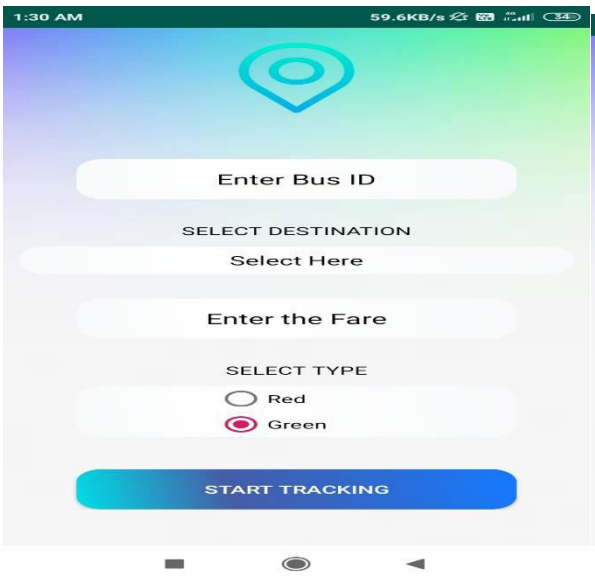

Fig 5 Home Page of Driver Application

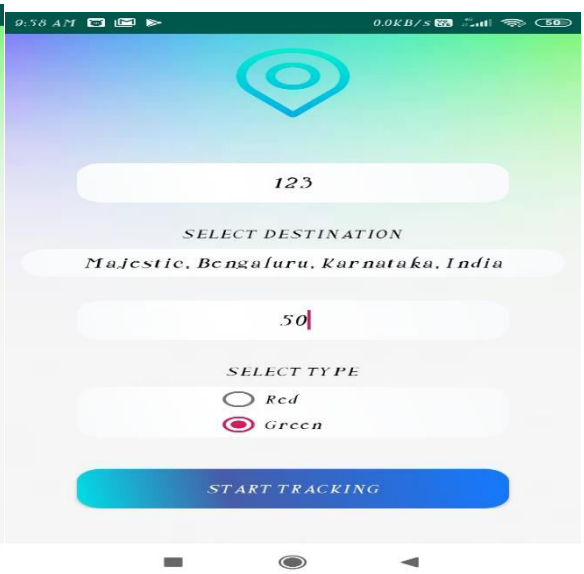

Fig 6 Screenshot with all details entered

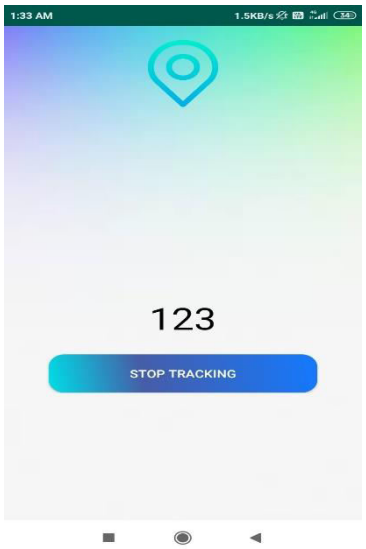

Fig 7 Screenshot showing stop Tracking Button

Fig 5 shows the home page of the driver application. Fig 6 this figure shows all the details regarding the destination and fare to reach that destination which is entered by the driver. Here the driver will start tracking the location by clicking on start tracking button. Fig 7 this figure shows the stop tracking button here the driver can stop tracking when he reaches destination.

User Application-Experimental results of the user application is shown in the below screenshots

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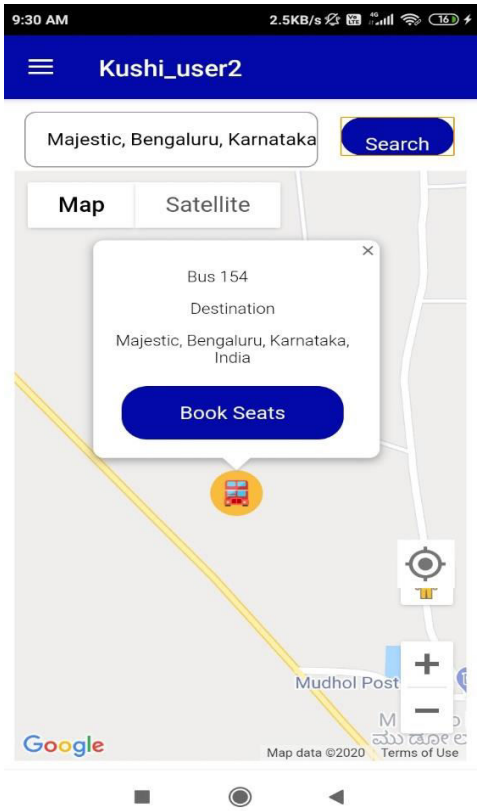


Fig 8 Home page of user application with destination

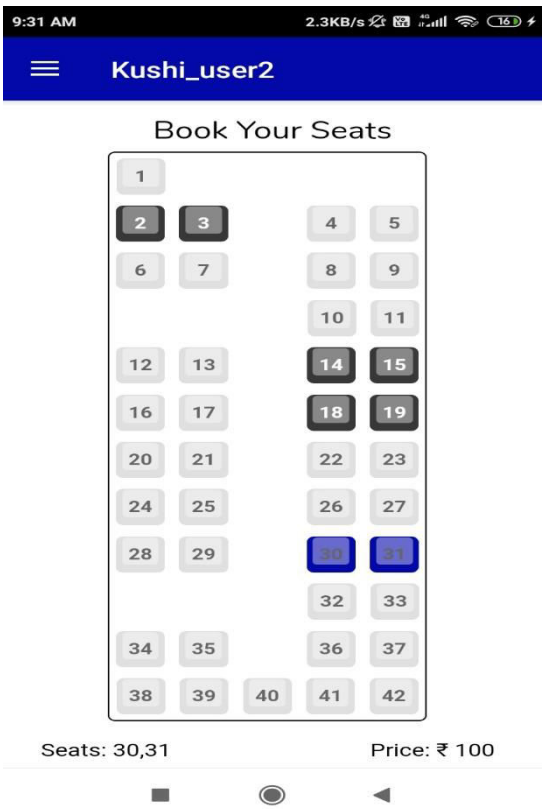
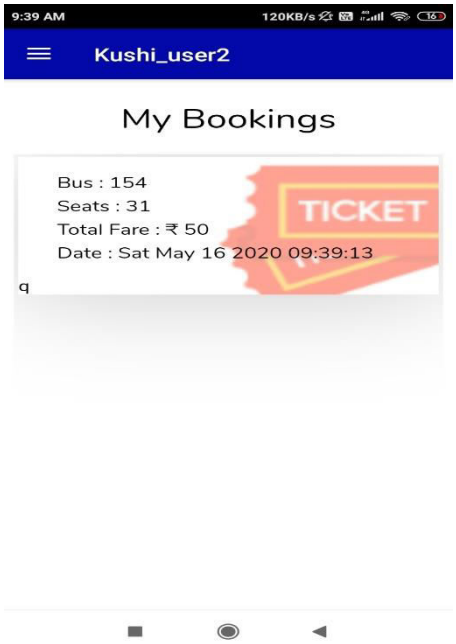


Fig 9 Seat Layout of the bus



Fi 10 E- Ticket

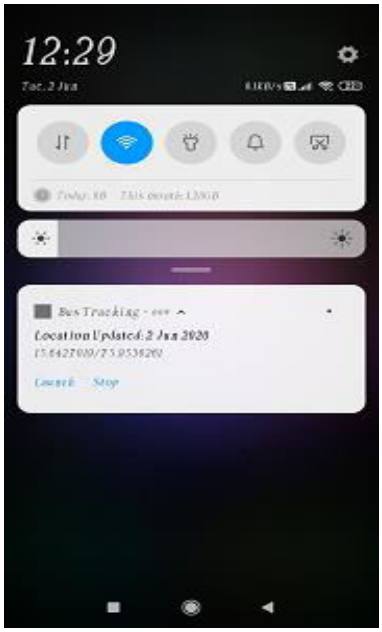


Fig 11 Showing Background Tracking

Fig 8 shows the home page of user application here the user can enter the destination in the search bar and search for the buses. And also, the of the availability of the buses which will travel to that destination which was entered by the user earlier user can select the bus at this stage. Fig 9 shows the seat layout of the bus the users here can select the seat in which they wish to travel. Fig 10 shows the ticket which is generated after the payment. This E-ticket is used during the time of travel. Fig 11 shows the screenshot of background location tracking which will be activated when the application that is the driver application is running at the back ground.

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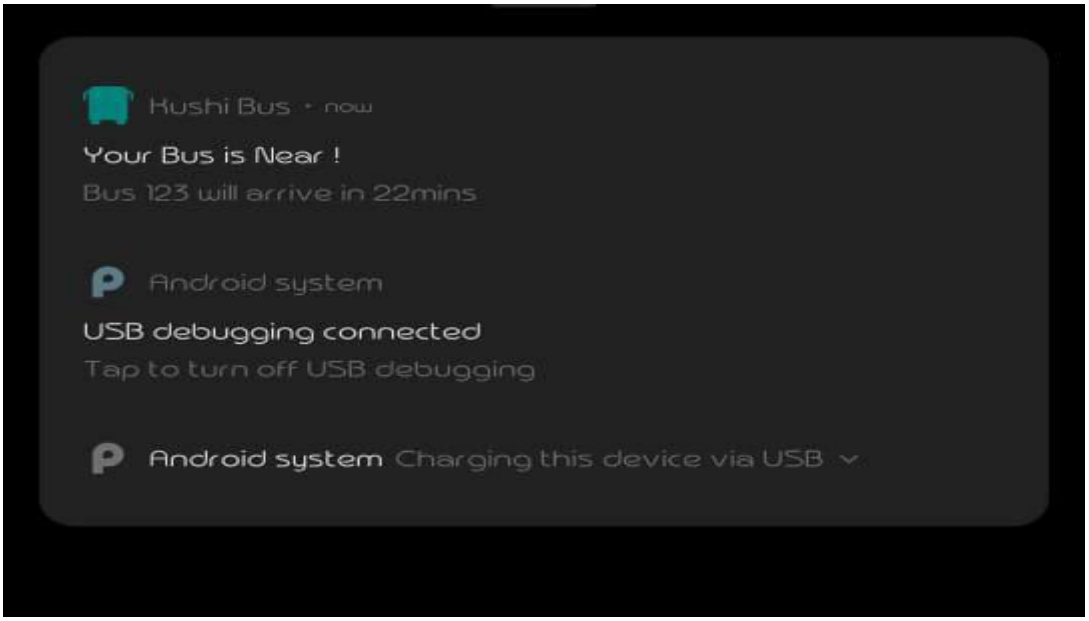

Fig 12 Screenshot showing the notifications received by users.

Fig 12 shows the screenshot of the notification messages that the users receive after booking the seats. This notification will be sent to the users by Firebase. This is done via FCM Firebase cloud messaging which is used to send cloud messages to the users.

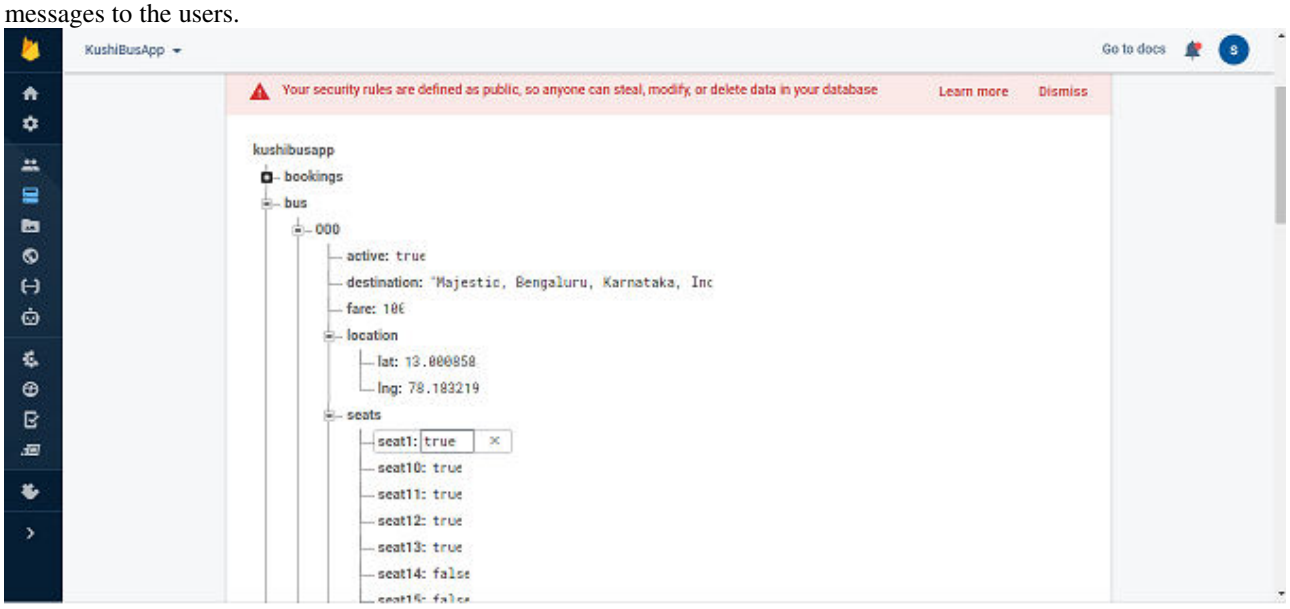

Fig 13 Screenshots showing the database of firebase

Fig13 shows the screenshot of firebase database which is the real time database used in the project here all the details of the project will be stored.

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V. CONCLUSION AND FUTURE WORK

By joining this basic vehicle following and seat reservation framework into open vehicle has made the life of the clients simple with which the clients can spare their past time which was squandered by hanging tight for the transports at the transport terminals without realizing the specific appearance time of the transport. And furthermore, the seat reservations should be possible which is a gigantic errand to do openly move by utilizing the application clients can book the seats which helps each traveller going in transport. Thus, the intention is accomplished as the vehicle following and seat reservation framework is created in a simple manner so every traveller can utilize the application with no difficulties. Which will be exceptionally valuable for many clients regularly.

The application can be further updated by adding intermediate stops as of now the applications works only from source to destination. And also, seat reservation system for the Passengers can also be updated by having a QR code generated when the user books the seat and then gets an QR code generated which acts as a ticket. The passengers can scan this QR code in the bus and can take his/her seat

REFERENCES

1. K Sujatha, K J Sruthi, P V Nageswara Roa, a Arjuna Roa**"**Design and Development of Android based Bus Tracking System**"** IEEE 2014.
2. Jianmie Lei, Siru Chen, Min Chen"Bus arrival time prediction method based on GPS position and real time traffic flow" IEEE 2017 IEEE 15th international conference,2017.
3. Jianmie Lei, Siru Chen, Min Chen"Bus arrival time prediction method based on GPS position and real time traffic flow" IEEE 2017 IEEE 15th international conference,2017.
4. Mohamed Abdalla Mokar, Sallam Osman Fageeri ,SaifEldinFattoh "using firebase cloud messaging to control mobile applications" IEEE 2019.
5. Leeza Singla and Parteek Bhatia "GPS based bus tracking system" IEEE 2015.
6. H. D. Pham, M. Drieberg, and C. C. Nguyen, "Development of vehicle tracking system using GPS and GSM modem," 2013 IEEE Conf. Open Syst. ICOS 2013, pp. 89–94, 2013
7. Mohammad Shah Alamgir, Israt Jahan, Nasrin Aktar "Chittagong University Teachers Bus tracking system using Smartphone application" 2019 IEEE 4th International Conference Electrical engineering and information,2019.
8. Mohammad Nazmul Hasan and Md. Sharif Hossen "Development of An Android Based Real Time Bus Tracking System" IEEE 2019
9. SanamKhazi, MurtuzaBagasrawala, Farheen Sheik "Smart E-ticketing system for public transport system" IEEE 2018.
10. Ayush Goyal, SaikatHazra, David Hicks"Android Application development a brief overview of android platform and evolution" IEEE third international conference on I-SMAC,2019