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Bus tracker system with seat availability checker

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Abstract: In this paper we have stated about solving common people problem using innovative ideas with help of circuits and android app (application). Here we consider some problems of people in bus transport. This android app tracks the current bus locations using GPS in the ticket printer (new single GPS chip would cost under $5 = Rs.300). And we have also created an algorithm to find the number of seats available. We use a ticket printer with a SIM card to send this information. So this app gives the information about number of seats available with the help of ticker printer and bus location to the mobile phone. Another arrangement is made to get this information in bus stops using display boards. One more additional feature is that is gives your current location while your travel using mobile signal you get with Rs.0 of cost. So you no need to worry or need not be aware that your place had arrived or not, in night travel or while going to a new place. This will solve the problems like waiting in bus stop and wasting time, going in a crowded bus and we give you a sleepy or peaceful journey.

I. STATISTICS

In the city of Chennai alone, 47 lakh people use the services of the MTC on a daily basis, A total of 21,989 buses are currently being operated in the State. Around 1.82 crore commuters use the service on a daily basis. So this is a must to make their travel easy.

II. ANDROID AND OUR APP

Android was initially developed by Android, Inc., which Google backed financially and later bought in 2005, Android was unveiled in 2007. Now it's very fast developing and has app for every human need and problem. In 2014 one million android phones are yet to come. So this will have the world in its hand and takes control over everything. So we think to solve problems using android app. Here we are going to discuss some of the problems of common people for which android apps are not yet developed.

III. PROBLEMS

Now-a-days everyday people are busy moving to offices, schools, or to some other places. The main thing they need is that transport, obviously bus. Many people are waiting for it and wasting their precious time. Since bus timings are generally unpredictable in our country. And many times they have to go in a very crowded bus, sometimes hanging which may lead to accidents. Another problem is sleepless night travel, when they need to get down the bus in the right place. Next problem comes while one goes to a new place, that is they need to be aware whether their place had arrived or not. Let's see some solutions for this problem through android apps.

IV. EXISTING APP

The already existing apps only have bus routes and timings. But that won't be exact and won't help people in any way. Eg.MTC Bus Route.

V. SOLUTION

We have some innovative ideas for android app, we have designed an app named Smart Bus Tracker (SBT), and this app has three features. The first one helps in tracking the buses with the help of GPS and track the exact bus location. This will very much help the people who usually waste time in waiting for buses. Second it has a facility to show the number of tickets available with the help of ticker printer of the conductor.

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Figure 1.Smart Bus tracker app.

This prevents us going in a crowded bus. And third a tower detector which detects and give alarm, when the particular area tower is reached. This helps us to find location (without GPS) when we are new to a place or if we need a sleep filled ride at night. The mock-up is shown below in figure 1.

VI. SMART BUS TRACKER

From the name itself, we could understand that we are going to track the location of buses. So we need GPS to be fitted in every bus. Now Texas Instruments announced at CTIA that a new single GPS chip would cost under $5 = Rs.300. And now very small GPS devices are produced.

VII.SEAT AVAILABILITY CHECKER

Here we are joining the GPS device with the ticket printer to track the location. We have another feature in this beautiful app to check the availability of seats inside the buses. Nowadays bus conductors use ticket printer to give away the tickets. When a person takes a ticket, the starting place and destination is recorded in the ticket printer. Similarly the details about every person in the bus are recorded in it. By doing simple mathematical calculations with simple an algorithm (as shown in the figure 2) no of passengers in bus is calculated.

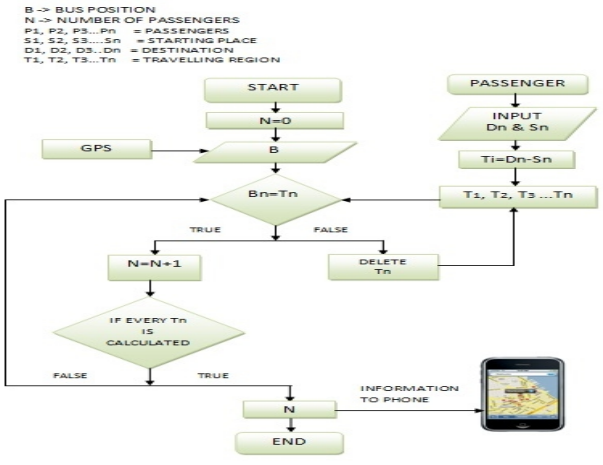


Figure 2.Flow chart to calculate no of passengers.

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VIII. SIMULATION FOR SEAT AVAILABILITY CHECKER

In this first we get the information of the bus location using the GPS in ticket printer. Then the persons traveling region is calculated from the starting place and destination given in the ticket printer. Then the bus position is compared with the traveling region of every person. If the bus position is inside the region, then the number of person is added with 1,this process repeats will very person's traveling region in the bus. If the bus position is not in the traveling region,it deletes the information about the person,which means the person has got down. So this cycle repeats frequently with the change in bus position. So this is how the number of person in the bus is calculated. The simulation for this is shown bellow. In this the number of point of intersection between the bus position and the region gives the number of persons in the bus. Simulation for tracking bus using GPS is not needed since every one knows about that.

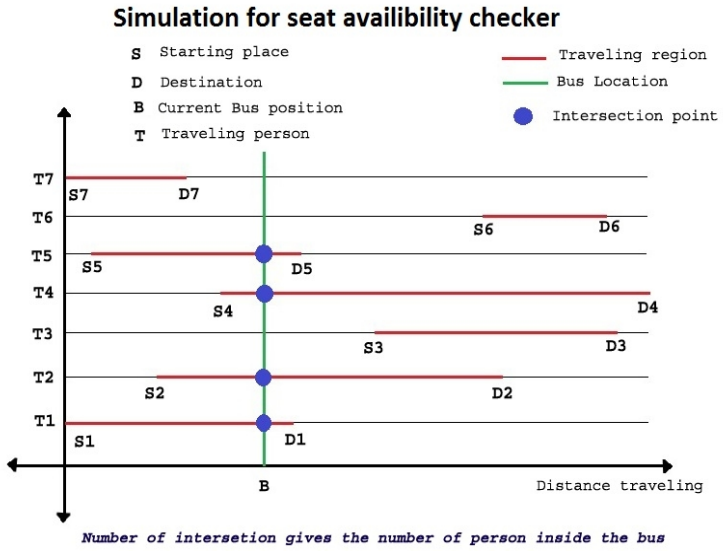


Figure 3.Simulation for seat availability checker.

So we can determine the numbers of seats filled and vacancies in the buses. By using a ticket printer with SIM card facility (as in figure 4). We are synchronizing the signals with server and now our app can get the details about the bus location.



Figure 4.Ticket printer with SIM card slot.

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So, using this app all people can plan ahead, by knowing the number of seats available in the bus and avoid crowded travel. They could easily no of seats filled and vacant.

IX. OVER ALL PROCESS

Here in the diagram we have given the over all process in the figure 6.In this bus revice GPS signal from satilite then it gives that signal to the mobile phone tower with the no of passegers via SIM card in the ticker printer.Then from there we are able to get those details.

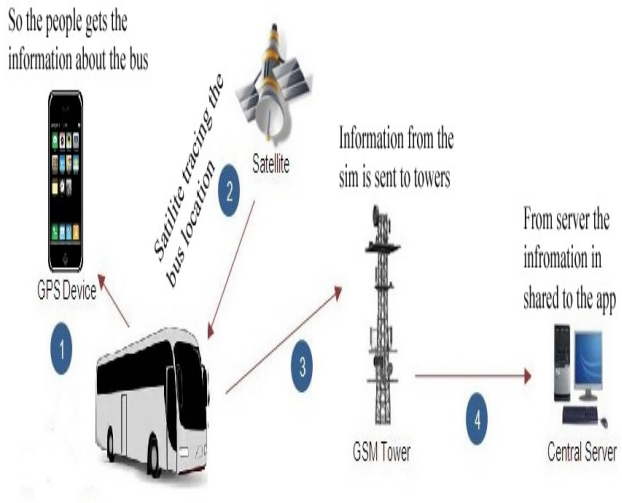


Figure 5.Overall process.

By the above process we can get the details in the mobile as shown in the below figure 6.



Figure 6. Smart Bus Tracker Showing Bus locations.

X. GIVING INFORMATION TO DEPOT

We can also send this information to the bus depot, by which they can easily get the information about the buses. It may help them to quickly find out if the bus is met with an accident or if stopped due to any problem like break down or puncture. The figure 7 shows the flow of information to the bus depot.

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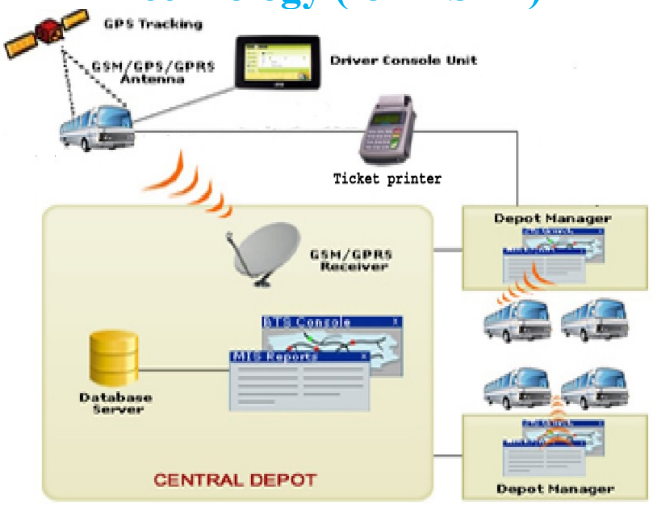


Figure 7.Transferring information to bus depot.

XI. DISPLAY IN BUS STAND

We make a display in bus stand for the people to get the information about the bus arrival time.

XII.TOWER DETECTOR

The next amazing feature of our app is to detect our current location only by using the mobile tower signals. Usually the mobile receive signals all the times. And by given a simple database containing the information about the locations where the towers are placed in a state, we could get our locations in mobile. We know that the mobile signals are wide ranged, so we could detect the current location. The mock-up of the tower detector is shown in figure 8.



Figure 8.Tower Detector

XIII. FUTURE

When our app comes in future there will be many changes in the world. No one will be waiting for buses in the bus stops. We need not go in a crowded bus. Everyone will have a luxurious travel without worrying about anything, mainly we need not to be aware that their place had arrived or not.

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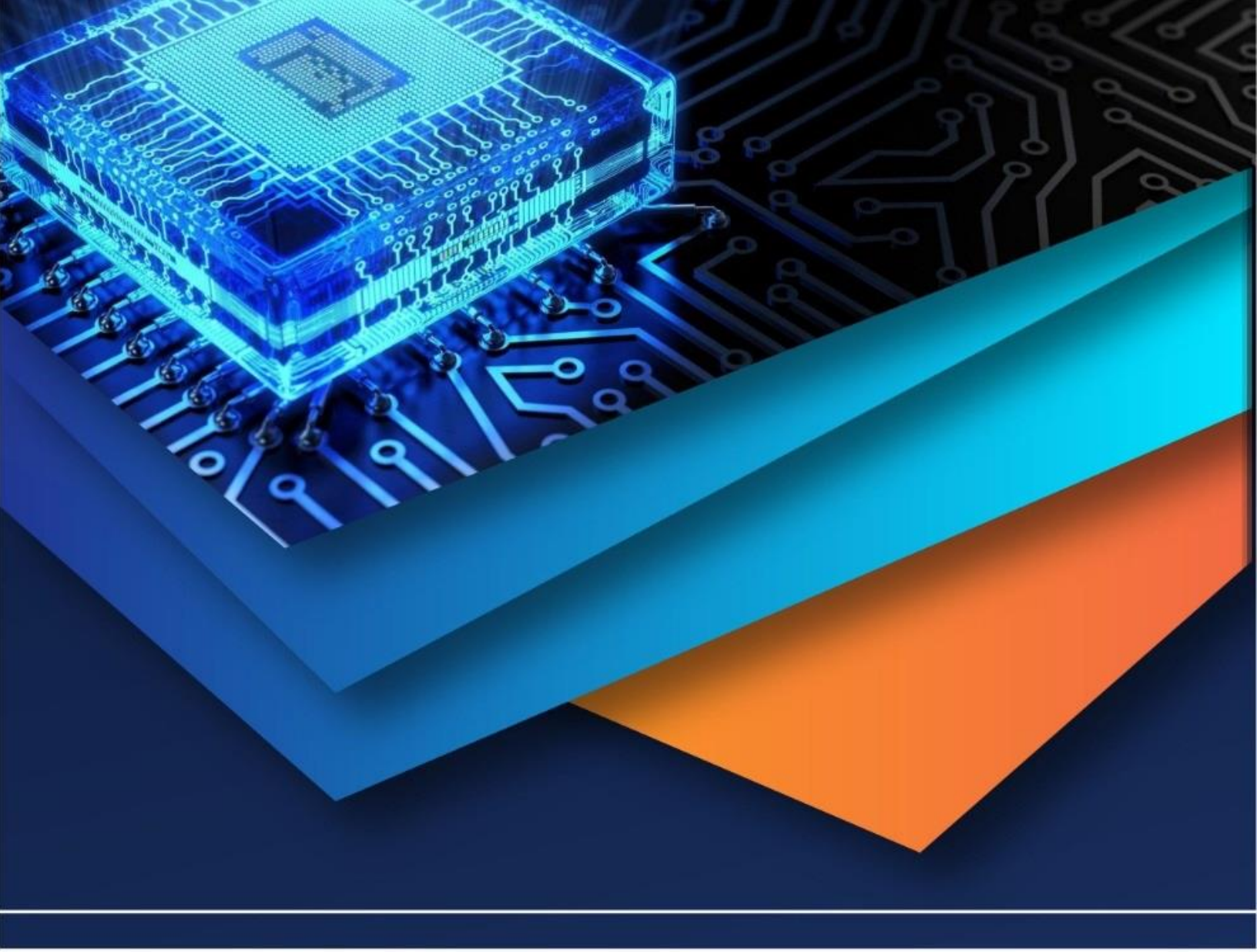
XIV. CONCLUSION

This app will give the exact location of buses at various position, says no of seats available and your current location by tower signal. This app will modernize transport system. Private buses or private companies having their own transport may implement this easily. Around 1.82 crore commuters use the service on a daily basis. So this is a must to make their travel easy. This will be cost effective and definitely feasible.

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