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Smart Navigation System for Buses with Location for Pakistan

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Abstract

Road traffic is getting worse with every passing day, especially in major urban centers such as Lahore. In Pakistan, it is important to be aware of the traffic situation before setting out on a predetermined path. The smart navigation tool for buses will allow them to reach their destination and bus stops on time by determining the traffic flow along their routes, and suggesting an alternative route wherever possible. People get in to the long traffic jams as they are not informed of they have less knowledge about the condition of traffic in particular area. General public also get into difficulties in numerous ways. Firstly they are not sure that when the bus will come to the station which waste a lot of their time. Secondly they didn't know whether bus is coming to their station or not.. We are going to develop a smart navigation system which will use the maps provided by Google maps and will update the current situation of traffic for the correct information to the bus driver so that he can take an alternate path on his route on real time. A system must be built for bus drivers that can help them guide through their journey and show alternate routes when the original route cannot be followed due to traffic jams. Entire system is monitored by the admin which is another part for the better development, generating monthly reports is also significant to ensure the reliability of transport. They will help determine the average time a bus takes to travel on its route, the areas that host the heaviest traffic flow, the number of times an alternative route was taken and the factors that have an impact on a traveler's experience.

Keywords: Displacement; Location; Blocked Traffic;

INTRODUCTION AND SCOPE

There are certain hurdles that produce panic and chaos in public i.e. the blockage due to protests, working on the roads, traffic jams and many alternative eventualities. To cater all these scenarios, we area unit going to develop a sensible navigation system will| which is able to} use the maps provided by Google maps and can update this state of affairs of traffic for the proper info to the busman so he can take associate degree alternate path on his route in real time. A system must be engineered for bus drivers that will facilitate them guide through their

journey and show alternate routes once the first route cannot be followed thanks to traffic jams. Our purpose in this project is to make that system for the easiness of bus system.

Street activity is deteriorating with each passing day, particularly in major urban focuses. In such a domain, it is essential to grasp about the movement circumstance before initiating on a predestined approach or a sought after course. Google is working for traffic feed however not up thereto extent in Asian nation. The brilliant route instrument for transports can allow folks in general transport transports to realize their destination and transport stops on time by telling the drivers antecedently whether or not their course is stuck by movement, and deciding the activity stream along these courses, with the ability to propose an possibility course where conceivable. This will be done utilizing associate degree robot application introduced on Android-controlled tablets altered on the dashboards of the transports. The application are going to be founded on Google Maps API. This apparatus can facilitate the neighborhood transport drivers to higher comprehend the movement stream within the town and decide on decisions taking into consideration the information they're provided with. It will also give the distance of bus from desired location and total distance covered by that bus for drivers contentment GPS will be the most frequent thing we will use in our project because we have to navigate the location of the bus through which user can easily track the current status of the bus. All buses will have an Android-powered device that will not only track their progress, but also suggest alternative routes on the map when required. It will be made sure that the suggested routes do not exceed the 10-kilometer limit from their planned route.

Incentives

- To shorten the distance between the user towards the required destination and user can choose an alternate path when the current route is delay due to some unkown conditions.
- Help for users to easily choose their destination route considering the flow of traffic
- End of unruly traffic.
- Flexibility for wardens to deal with easy going of traffic.
- To assist local police force and ambulance in emergency situations.

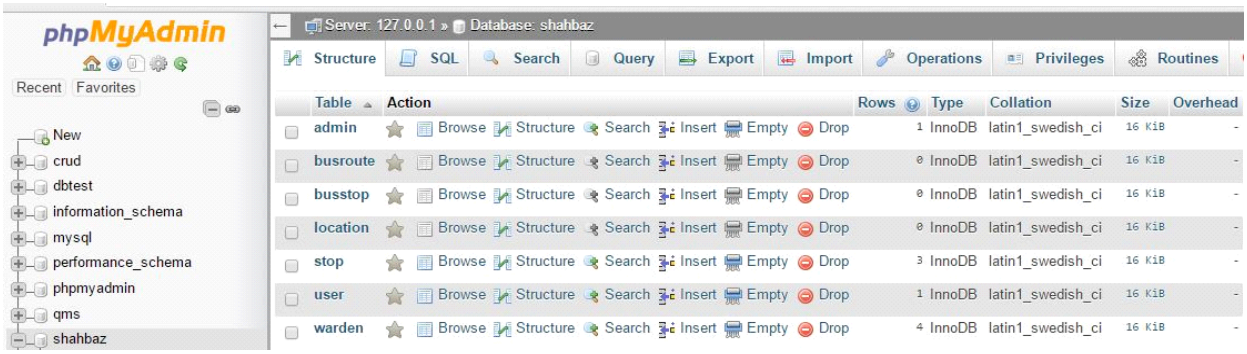
Functioning

The devices which are giving to the warden have login first in which the warden will add his assigned number and password. Each road will have its own device from which the situation of traffic is updated. After logging in to the device, option of updating traffic situation is there. For the reliability of warden, we are designing such an interface that will take warden's minimum time so he can also manage traffic easily there. There will be five options of intensity of traffic i.e. insane, heavy, medium, low and very low. After updating it, there will be further options of the reason behind traffic i.e. Protest, traffic jam, construction and emergency. This is the only work which a warden will do twice an hour.

The general functionality of the system will be built around the Google Maps API, which is a powerful JavaScript based API that comes with many built-in features. The data related to routes and alternate routes will directly be fetched from Google's servers, with modifications that are required to match this system. Meanwhile, the Android-based application installed in portable devices will update us with buses' locations from time to time, enabling us to collect critical data that can later be used to improve the efficiency of the system. This data will also help us in generating monthly reports. Admin can also declare emergency so that all the buses on the track, have to report back to the station. As traffic system is too much damaged in Pakistan, so after starting from one city, we will expand it to major cities in Pakistan. This will

not only avoid traffic jams but will also help many people to avoid wastage of time. We will later on add something to make the ambulance system smarter and to make ambulance report to the nearest hospital by avoiding them getting into the traffic

The database is using large amount of tables in which traffic status is been stored. There are independent tables for administrator, warden and user and data is stored in them regarding to their requirements. Locations of bus stops and bus with their respective routes are also stored in database with the information and data of wardens and users. The database is online and it is accessible for both web application and android application



LITERATURE REVIEW

Many tasks in world are made on retaining GPS in intellect with recognize to traffic process. The demonstration of the difference between these tasks and our undertaking can be given beneath. To begin with we will talk about all of the tasks which resembles to our assignment and there facets and then we will speak about that why our undertaking is superior to them.

The first instance is of Google are living traffic. Consistent with [1] https://www.Ncta.Com/platform/broadband-web/how-google-tracks-traffic/, essentially the most punctual emphases of Google Maps had no exercise feature–it was well-nigh based round getting participants from factor A to point B. In the end, it introduced the capability to illustrate how serious action would back a driver off, so consumers would perceive to what extent the equal direction would take "in colossal recreation." This used to be founded off of "noteworthy expertise they could accumulate," about what exercise was just like on that certain path when it existed, says Mike Dobson, president of Telemapics, an institution that tries to maintain geological problems.

There aren't any suitable traffic process and laws which ended in the enormous site visitors jams and site visitors chaos.. This resulted in the poor site visitors jam and quite a few time wastage. In keeping with [2] http://www.Rasta.pk, GPS methods are the quality to consultant people. To handle this all we're making this utility. We are imposing this on a bus process to make it a smart bus navigation procedure. Correct site visitors steering shall be delivered to the drivers of the bus. Not best is that this, but the purpose of that visitors jam or blockage also supplied. Furthermore to it, alternate paths can even be provided to restrict the blockage. There may be a few alternate routes; the route with less distance will also be instructed to the driver. It is proper GPS headquartered software utilising Google API's.

Yet, a 12 months ago, Google Maps turned out to be a first-class deal extra priceless to drivers, in gentle of the fact that notwithstanding delivering bearings, they likewise commenced to offer regular perspectives of how congested the streets had been. In the occasion that a avenue

is shaded inexperienced, it method it is relocating alongside, nevertheless a yellow avenue proposes some action and a purple avenue implies far more clog. It is similar to Google has its own unique movement helicopters navigating the streets normally–except that they don't. In case you're much like us, you expected that Google Maps was once utilizing some cycle of the cameras it makes use of for Google Earth to advisor movement.

Google understood that as extra members stored on changing to cellphone telephones, that they had slightly armed force of endeavor monitors that they might make utilization of. Along these traces, the movement move that you just see in your advisor is a profoundly special ongoing presentation of the number of Android telephones that are as of now making an attempt to make that same trek. Reference is from [4] https://www.Waze.Com/livemap . Waze varies from conventional GPS route programming in that it's team driven, gathering critical advisor knowledge and action information from its customers. Like exceptional GPS programming it beneficial properties from customers' driving times to present directing and ongoing action overhauls. Members can report mishaps, congested using conditions, velocity and police traps, and from the online advisor editorial supervisor, can upgrade streets, historic elements, house numbers, and so on. As of January 2012, the appliance had been downloaded 12 million instances around the world. In July 2012 Waze stated that it had come to 20 million consumers, half of of them enlisted prior to now six months. However flip-by using-turn voice route, constant motion, and different subject unique cautions, Waze whilst sends unknown information, together with consumers' speed and subject, back to its database to enhance the administration total. This crowdsourcing permits the Waze team to record route and jogging so as to map mistakes and automobile crashes clearly the application while riding. Waze utilizes gaming traditions to draw in consumers and urge them to offer more data, enabling them to "roll over" symbols of cupcakes and exclusive things to obtain focuses. In June 2012 Waze dispatched an improve to give ongoing fuel charges

For the reason that November 2012, in adapting its application, Waze offers associates and sponsors an internet interface to promote in mild of areas the place a bit symbol will exhibit up on a given discipline for an intrigued Wazer to draw in with the advertisements. It likewise presents to tv information stations an internet interface to telecast current movement reports and cautions straightforwardly from the Waze software; the administration had been utilized via 25 tv U.S. News stations by way of June 2013. It has moreover been utilized as a part of Rio de Janeiro inside of Rio's Operations center seeing that July 24, 2013, and in addition in ny and New Jersey because 2012. In June 2013, Waze offered a worldwide limit prolong that empowers future street terminations and steady motion redesigns amid real events in a given nation, for instance Tour de France.

Presently we will be able to take around one other application that's INRIX from [5] http://inrix.Com/inrix-visitors-app/ . INRIX® site visitors considers every movement element, together with movement clog, avenue development, mishaps, events, police action, and verifiable endeavor examples to give you the most finish pastime expertise accessible. With custom-made pastime from INRIX® site visitors, that you can choose knowledgeable riding picks – like the pleasant time to depart and which course to take. Taking after are the elements which are offered by using INRIX: First one is activity news which personalize and sees all information essential to your pressure on one display. Under no circumstances be amazed by means of social gathering action once more! It demonstrates motion guide to see present endeavor conditions, episodes, progress, occasions, police and street terminations. It advocate you the speediest courses and to look and distinction the quickest publications with your high destinations. From INRIX, Now which you can appear for intervening time areas right from the

consultant and share your touchdown time. It offers you choice to share the entry time on a single tick to message or e-mail your landing time to loved ones. It demonstrates the takeoff alarm and notices for when to go away for an on-time entry. By using action cameras, one can find rather more element with undertaking cameras along your course. It offers you pastime cautions and also you get live movement alarms about action delays, contemplating your field and inclinations. Cloud sync make you see you're spared puts and guides on more than a few items. It has premium form too. In top rate kind, save and monitor courses for a boundless number of spot and spot gas expenses suggested by way of mysterious MasterCard exchanges upgraded.

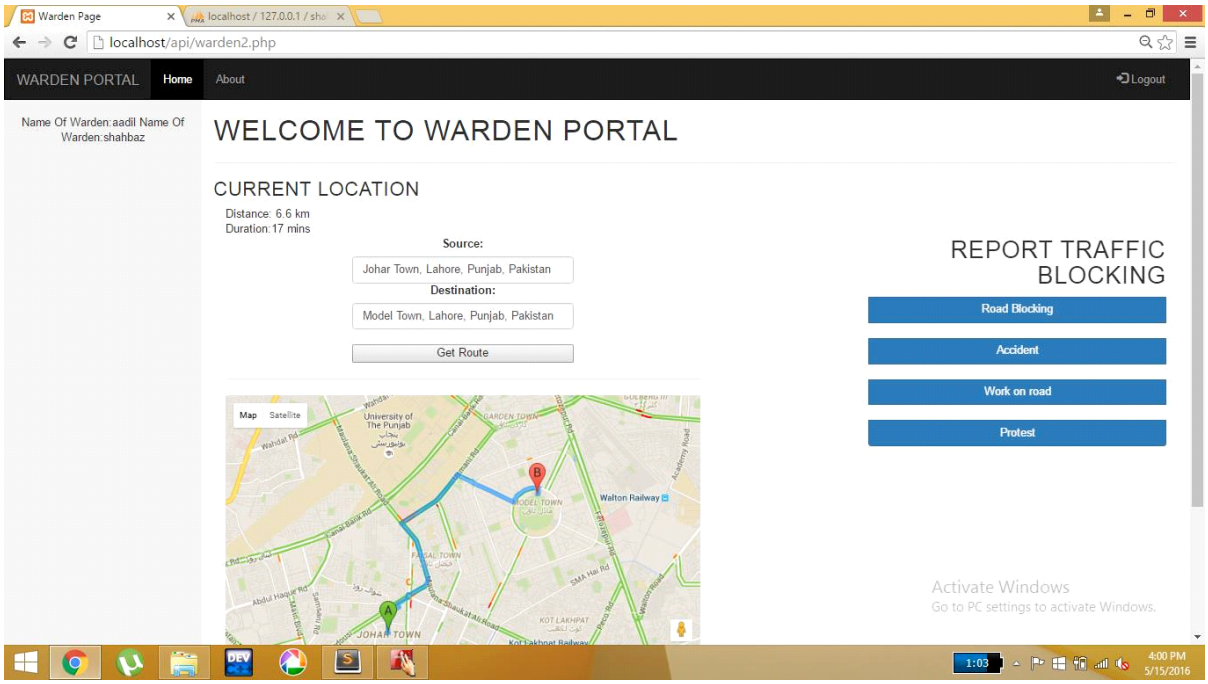
DESIGN AND DEVELOPMENT

There are two ways to use this application, one is installing the application from Android store and the other is getting aware of the current traffic flow using website which holds the same data and road traffic updates from android application. A person who once installs the application has the facility of reporting to road traffic and view the alternate path,after being a registered user with the android application or website, User can report the traffic block status and its intensity, its severity and their location(longitudes and latitudes will be extracted) will be automatically sent to administrator for a verification.

WEB APPLICATION

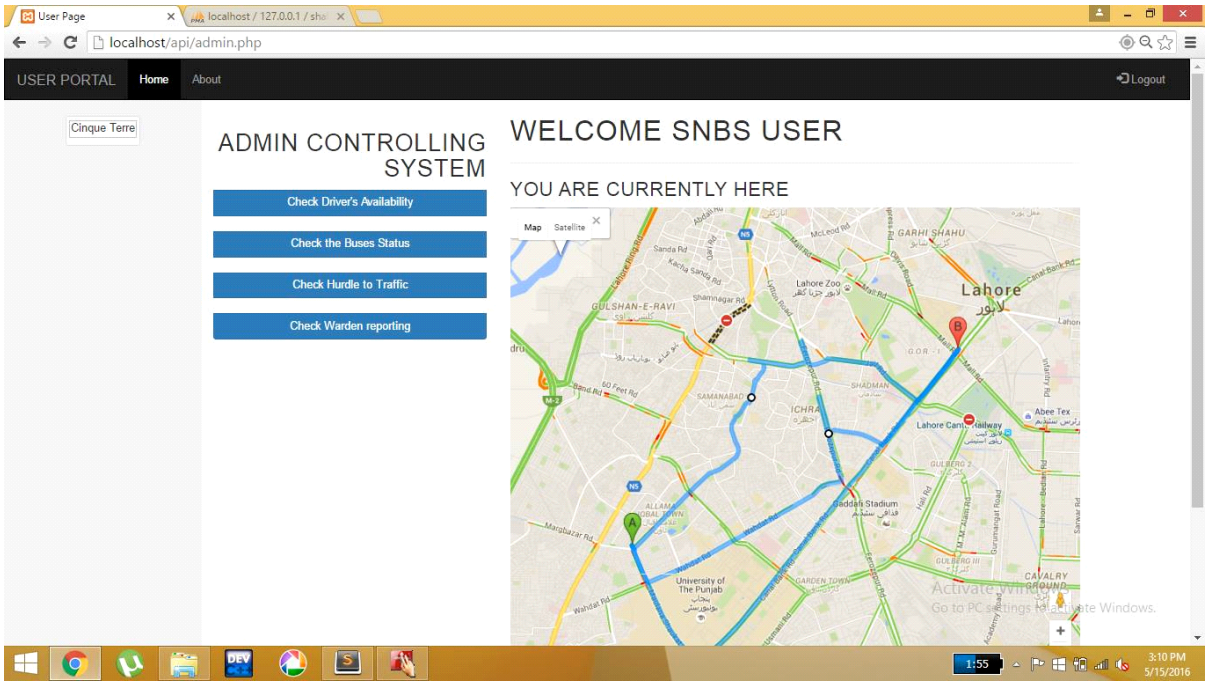
Warden Console

Warden will have the responsibility to update traffic routes status depending upon the traffic flow (i.e High, Medium, Low). Each warden will have a particular area assigned in which it is his responsibilty to update traffic status and reason of traffic blockage that could be due to road is under-construction, Accident, Protest or any other random reason,, then its reported traffic status will be updated in database and users of android application will get to know about it as well.



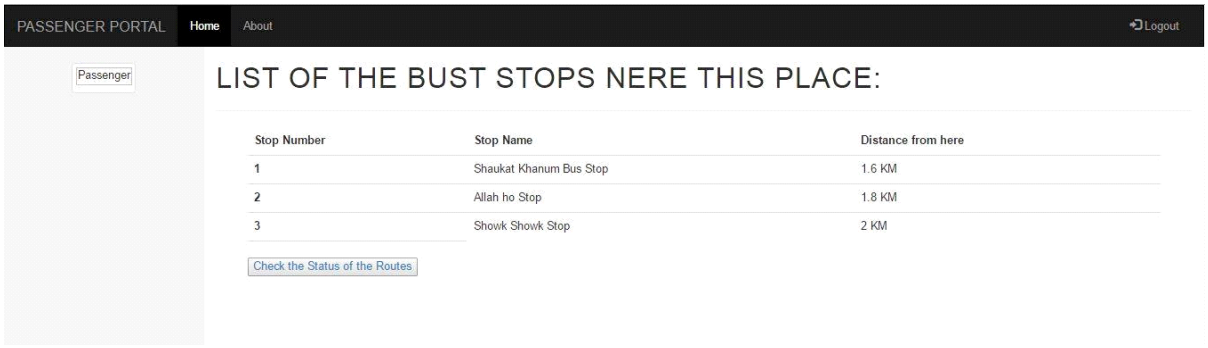
Admin Console

Admin is the head of all consoles which means that he is able to control all consoles of warden and passengers. Admin is capable of checking availability of warden on their assigned areas and bus drivers to their routes. Bus current states and traffic status can also be checked by admin which includes that how far is bus from its destination, how long will it take and what is the traffic status in their route. Whenever there will be a change required in login settings, user or warden will send a notification or report an issue to admin, admin is responsible for resolving their issues in order to make this navigation system convenient for use.



User Console

User will get a proper username and password after signing-up. He can choose its current location and destination and then check the traffic update that is which route is more convenient to adopt. If user isn't satisfied due to heavy traffic load on selected route (which could be because of accident, road under-construction or any other reason) then an alternate path is provided within 10 kilometers of diameter to its same selected destination. This alternate path will be less in distance and user just have to follow this provided alternate path to reach towards its destination.



Android Application

Android Application is developed for the beneficial of users. This android application will have same consoles (i.e Warden, Admin & Users). Every console will have the same functionality

similar to web application. Warden will update traffic status, Admin will look after both consoles and User will will be able to adopt alternate paths when traffic status is bad. Database of android application and web application is same so that when user creates a account or warden update a traffic status, it gets stored in same database so it could be easily accessible. The purpose of this android application is when a user is not in a appropriate location to get access to website. He can simply log-in and use this navigation system. On the other hand, it would be difficult for users like drivers to log-in to web application and select path again and again. Our puporse is to gratify users not to make this navigation system complex and hard to use for them.

Google Maps

Google MAP is also one of the famous feature of Google which help people to view dynamic and interactive design of map of the world. People can easily locate the desired place where they want to go along with the distance to travel. This feature will help the user to choose their routes according to traffic conditions or choose contingency route towards a destination.

Real Time Working

Our system consists of multiple devices which are having GPS and are linked with the satellite. They are also having mobile network for a proper use of internet in it so they can find bus location efficiently. Google API is used in this project so the live traffic system can be updated.

Smart mobile have the functionality of GPS in which they can connect to the GPS satellite and send their current longitude and altitude to the satellite, in return they point out their current locations. User will use this application with mobile network to make it use with internet and allow the NTS server to fetch and work with GPS satellite.

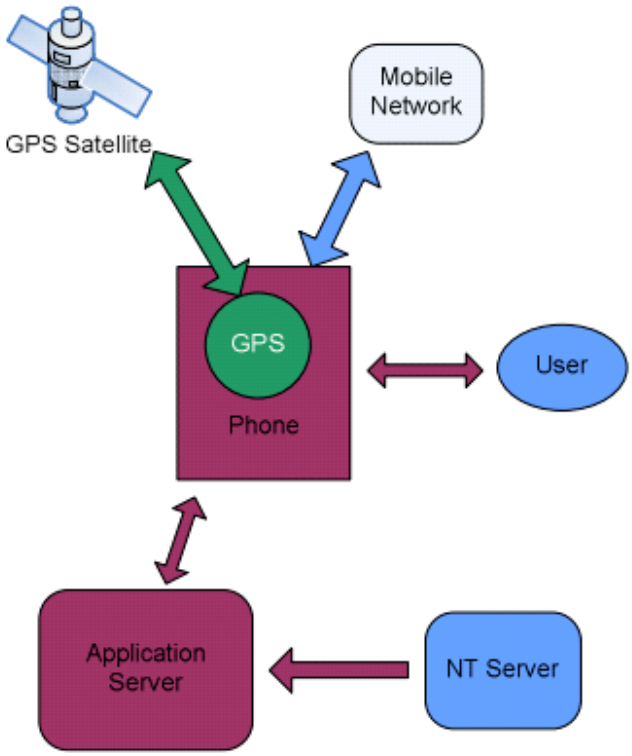


Fig1. Real Time Working

System Architecture

The bus driver is having a tablet which is continuously locating it with the help of GPS in it and is directly attached to Google maps API. The traffic warden updates the situation of traffic and its cause which will directly be shown on the maps. The alternate paths are also available if there is any type of blockage occurred so that the bus driver can choose the path in the case of reaching the desired destination. The entire bus scenario is visible to the general public.

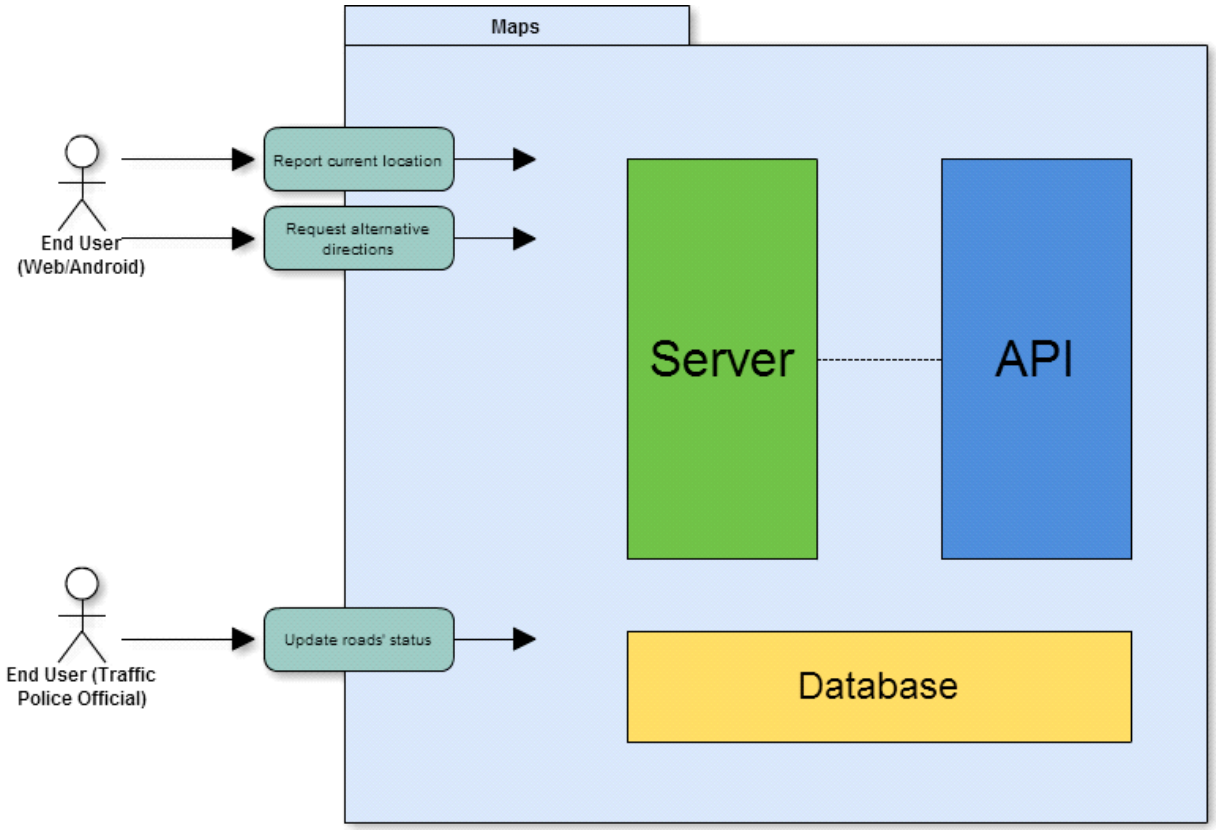


Fig2. System Architecture

CONCLUSION

In urban areas,People get in to the long traffic jams as they are not informed of they have less knowledge about the condition of traffic in particular area. General public also get into difficulties in numerous ways. Firstly they are not sure that when the bus will come to the stop which waste a lot of their time. Secondly they didn't even know if no bus is coming to that stop. To cater all of these conditions, we are making this system which will help major general public and the bus drivers to avoid wastage of time by avoiding traffic jams. We are going to develop a smart navigation system which will use the maps provided by Google maps and will update the current situation of traffic for the correct information to the bus driver so that he can take an alternate path on his route in real time. A system must be built for bus drivers that can help them guide through their journey and show alternate routes when the original route cannot be followed due to traffic jams. Our purpose in this project is to build that system for the easiness of bus system.

Street activity is deteriorating with each passing day, particularly in major urban focuses, for example, Lahore. In such a domain, it is essential to know about the movement circumstance before setting out on a foreordained way or a coveted course. The brilliant route instrument for transports will permit people in general transport transports to achieve their destination and transport stops on time by telling the drivers previously whether their course is stuck by

movement, and deciding the activity stream along these courses, with the ability to propose an option course wherever conceivable.

FUTURE GOALS

As our project is too much wide so we will try to implement it on commercial level to make the bus system smart. As traffic system is too much damaged in Pakistan, so after starting from one city, we will expand it to major cities in Pakistan. This will not only avoid traffic jams but will also help many people to avoid wastage of time. We will later on add something to make the ambulance system smarter and to make ambulance report to the nearest hospital by avoiding them getting into the traffic. Each ambulance will have a GPS device which will be connected to a server that will show the ambulance on regular interval the list of hospitals and the nearest hospital. It will also show them the easiest way to reach that hospital. We will also launch GPS based smart capsule service all over Pakistan which will help people to reach the desired destination quickly though shortest path.

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