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# Optimized Transit Alert System with Real Time Data

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**ABSTRACT**: Design a system with an approach that makes our everyday urban transit much simpler and more usable. The system will find best routes to our destination with departure details also simply alerting us with all the information we need, automatically. Indian Railways is the most convenient transit mode for the people. According to Indian government report published in 2011-12, there is a total 89,801 km running track route and 7,146 numbers of stations. Total distance covered by the 14300 trains of the Indian Railways everyday equals three and half times distance to moon. We can say that at any given time around 2 million people are in train, travelling. This only includes long distance trains, considering suburban trains of Mumbai, Kolkata, and Chennai etc. would add another 100000 or so people in a train at any given time. So, there is a need for an intelligent system for passengers, which would assist and guide them accurately to save their time and efforts resulting in giving them additional comfort.There is need for intelligent system for passengers that would help them to know the train schedule, to know the current running status of train and to get alert [1] like reminder for their saved source station or destination station. When passenger is travelling, the most portable and convenient device with him/her is mobile phone, so proposed system should run on mobile to increase the targeted audience and increase the scope of proposed system. There is a need of an optimized alert system that can provide status of the designated train relieving the system user from waiting for uncertain time on station. When the passenger is travelling by long distance express trains, there is some anxiety as when he/she will reach the expected station. Passenger may also want to know about the current location. In case of any critical scenario when the train has stopped at a crossing or for some other reason at any rural area, the proposed system will help the passenger to find the current location.The alert system will alert passenger when train comes closer to destination station, all such problems will be resolved by the proposed system.

**KEYWORDS**: Transit, Transit alert, Indian railway alert, location services, location monitoring

## I. INTRODUCTION

Indian Railways is an Indian state-owned enterprise, owned and operated by the Government of India through the Ministry of Railways. It is one of the world's largest railway networks comprising 115,000 km (71,000 mi) of track over a route of 65,436 km (40,660 mi) and 7,172 stations. In 2014-15, IR carried 8.397 billion passengers annually or more than 23 million passengers a day (roughly half of whom were suburban passengers) and 1050.18 million tons of freight in the year. In 2014–2015 Indian Railways had revenues of 1634.50 billion (US$26 billion) which consists of 1069.27 billion (US$17 billion) from freight and 402.80 billion (US$6.4 billion) from passenger's tickets.

Railways were first introduced to India in the year 1853 from Mumbai to Thane. In 1951 the systems were nationalised as one unit, the Indian Railways, becoming one of the largest networks in the world. IR operates both long distance and suburban rail systems on a multi-gauge network of broad, metre and narrow gauges. It also owns locomotive and coach production facilities at several places in India and are assigned codes identifying their gauge, kind of power and type of operation. Its operations cover twenty-nine states and seven union territories and also provides limited international services to Nepal, Bangladesh and Pakistan. Indian Railways, as we all know, is the most popular and used

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transportation source in India. It is not only ginormous in terms of rail network but also the number of passengers travelling on railways. The sheer number of people accessing IRCTC website every day at the same time despite the booking capacity of 7200 tickets per minute, results in the website working at a snail slow speed and visitor's agony.

## II. LITERATURE SURVEY

Indian Railways is the most convenient transit mode for the people. According to Indian government report published in 2011-12, there is a total 89,801 km running track route and 7,146 number of stations. Total distance covered by the 14300 trains of the Indian Railways everyday equals three and half times distance to moon. We can say that at any given time around 2 million people are in train, travelling. This only includes long distance trains, considering suburban trains of Mumbai, Kolkata, and Chennai etc. would add another 100000 or so people in a train at any given time.So, there is a need for an intelligent system for passengers, which would assist and guide them accurately to save their time and efforts resulting in giving them additional comfort.

Need to work on optimized use of location services of mobile device, so that we can fire accurate alerts and notify passenger about the all information that passenger need. Need to work on third party services that Indian rail services, need to integrate those services in mobile device so that passenger can easily provide the required data to the system. Need to work on finding live status of train with current location of train with or without the availability of cell phone network that will optimize and increases the accuracy in result.

## III. PROPOSED METHODOLOGY AND DISCUSSION

A. *Design Considerations:*

- Passenger travelling via Indian Rail.
- Passenger should have iPhone device and installed simulated app for proposed system.
- Passenger should save alert for getting alerts of specific transit route.
- While receiving alert, mobile device of Passenger should be ON with location sharing enabled.

B. *Description of the Proposed System:*

The main goal of this project is to make the trip convenient for passengers while travelling via Indian Railways. The basic architecture diagram is as shown below.

1.*Creating Alert*: To get details of the route and alerts, passenger first has to input values like source station, destination station and time for travelling and save it on device i.e. creating alert. Once the alert is created the monitoring will start and user will be able to get notifications.

2.*Fetch Live Status:*After saving the alert, the passenger should get the real-time data, i.e. whether the train is on time or not. If not, this system will provide you detailed information about delay etc. To show such real time information we fetch the live status of train from live status train server[2].

3.*Time based Alert Calculation*: In critical condition when we are not able to communicate with server due to network unavailability, we can show the time-based alert and notify user about approximate time.

4.*Monitor destination station region*: To notify user, we can create a virtual region[3] considering destination station as center. So, once the device enters the region we can start the process of notifying passenger.

5.*Show current route on map:*Once alert is created we can generate the route map of stations and current location of the train, using iOS mapkit[4] so user can get full details of his travel route.

6.*Server:*We need to access the Indian rail info server, this server gives us the static timetable or schedule about the trains travelling from source station to destination station. For this we need to handle jsonparsing[5] from iOS side.

7. *Database*: We need to store the details of route that passenger needs alerts for. These details are required frequently to update the real-time data and we also need to update the local database according to live server status, and finally show user information about current status of train and notify with alerts. For this, we can use sqlite[6] from iOS side.

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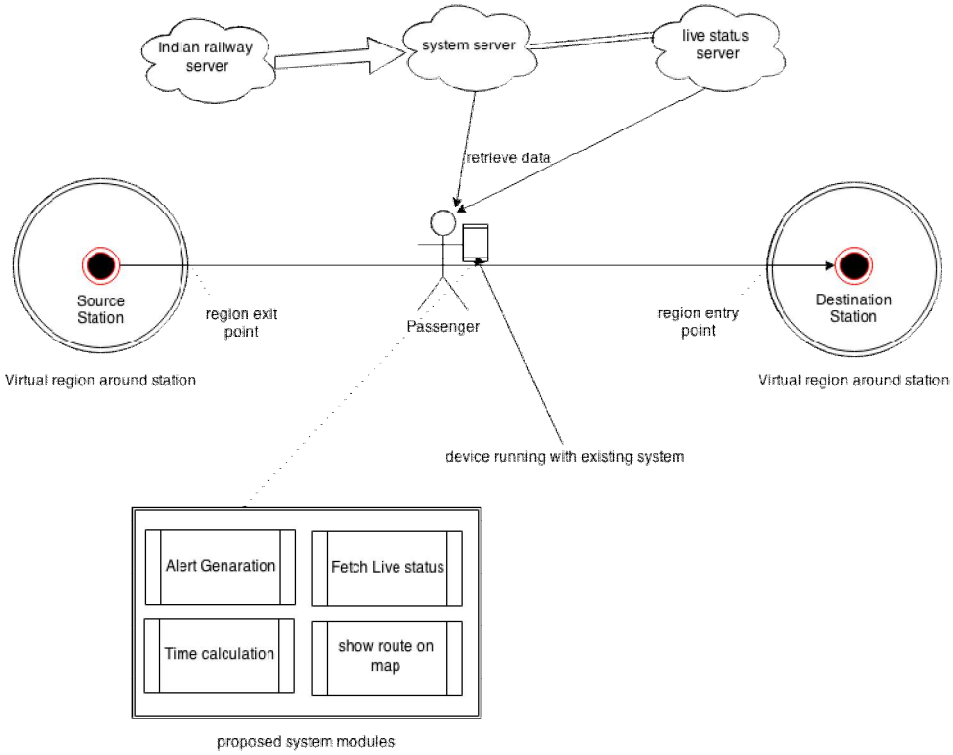


Fig.1.system module diagrams

This proposed system is totally based on device location and region monitoring concept mobile devices, we are creating region with latitude and longitude of all stations between selected train route, the radius of the region can be vary from 500mts to 5kms, once travelling passenger enters into virtually created region the system generates notification and in background we are saving region entry time as actual arrival time and region exit time as actual departure time, which will be useful for tracking real-time data.

## IV. EXPERIMENTAL RESULTS

Step 1: Install application on iOS device running iOS 10 and above
Step 2: Create alert, for creating alert first search stations i.e. from and to station then enter journey date, these three inputs are important to fetch number of routes available between particular stations on particular day. For now,lets choose from station as *Solapur*and to station as *Pune,* as shown in fig 2.
Step 3: Now once we have fetched routes or trains, Passenger can select train of his expected journey, for now let's select train no. *12158* which is named as *HutatmaExpresss.* Passenger can see the detail route of that train and Save that train for getting Alerts. Trains detail route can be shown as fig 3.
Step 4:Once alert saved with details, system internally started monitoring the regions, the regions are created on the basic of actual physical location of stations in between route of *from station* and *to station.*
Step 5: Region monitoring is continuous running process and whenever Passenger enters into the region the system will fire a notification and make passenger aware about the arrived station, as shown in fig. 4

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Fig.2.trains list

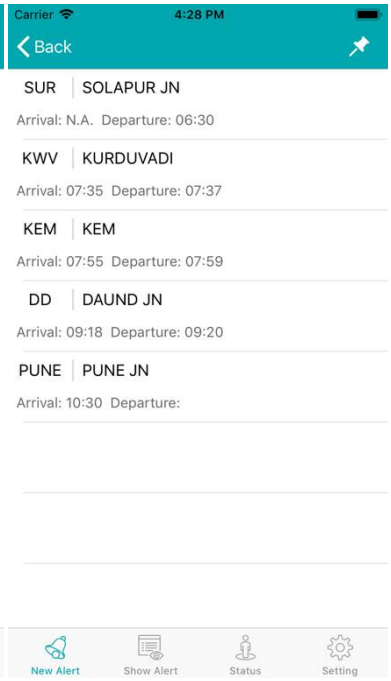

Fig.3.train route details

Fig.4.system alerts

## V. CONCLUSION

There is a need of an optimized alert system, that can provide status of the designated train relieving the system user from waiting for uncertain time on station. When the passenger is travelling by long distance express trains, there is some anxiety as when he/she will reach the expected station. Passenger may also want to know about the current location. In case of any critical scenario when the train has stopped at a crossing or for some other reason at any rural area, the developed system will help the passenger to find the current location. Passengers are getting alerts for the train is arriving and departing from source station to destination is on time on not. Passengers are getting alerts for, where is he/she at any given time whether the train is running on not. Passenger are receiving Alerts like reminders before reaching to destination.

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