

# Alert Notification Based on the Condition of the Road

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**Abstract**— Accident Prone Spots need to be identified so that preventive measure may be taken up. This application will enable the Road Users to update the Accident Spots, bad Condition of Roads, dangerous turns etc., and it gives alert notification to the users who come across the same location using their GPS location. When they are a Kilometre ahead and it also sends an alert notification to the Highway Maintenance Authority regarding the road Condition. The application shall also ensure the communication to the Road User about the Action Taken by the Highway Maintenance Authority. This is a user-friendly application.

**Key words:** Android, Accident Spots, Bad Condition of Roads, Dangerous turns, Smartphone

## I. INTRODUCTION

Accidents have become the major problem of this era. Accidents are mainly caused because of poor road conditions and lack of carefulness. Accidents occur mainly due to the bad condition of roads. To reduce this accidents, roads should be in good condition. Roads are the biggest asset of our nation. People should realize the use of our roads and should aware others about the roads.

National highway authority must create awareness and must take steps to reconstruct the roads to create the safe future.

As we know that government and the country folks has no good communication between them, this application let us to grumble the conditions of the road and people can crave for the better roads.

This application will make the communication between the folks and government much easier, healthier and lets us know whether the government has taken certain steps or not.

Smart phones are based on operating systems like blackberry, I OS and Android. To design proposed project, smart phones with Android operating system are used.

The application is compatible with all Android versions ranging from Lollipop 5.0.1 to Nougat 7.1.2 and people located in remote, rural area can also take the advantage of this application.

## II. USER MODULES

### A. Register:

User have to register with the details like user name, password, Address, Mobile number etc. User are supposed to register in order to login.

### B. Login:

User can login here by entering the username and password. If User enters wrong username or password the system cannot be accessed.

### C. Send Report:

Road user can send the report along with condition of the road, reason for the report. While sending the report, location of the user updated by using the GPS of mobile phone. User need to change the location status from off to on to send the report. Generated reports are stored in database. Using Google maps the nearest highway authority office was identified. Depends on the location of the user, the generated report will send to the corresponding highway authority office.

### D. My Report:

In this module user can view the reports that are already generated. This report also contains the information about the current status of the particular report. Every generated report was associated with the corresponding user. The user id is used to associate the report to only related user.

### E. Notification:

If Current location of the user travelling, had any reports in the database, user get notification about the location along with condition of the road, reason and status.

The status of the report will display depends on the access of highway authority.

The status option along with the report can be changeable by the users, according to the current status of the road condition.

The status of the report is displayed depending on the status given by more number of users.

## III. AUTHORITY MODULES

### A. Login:

Admin can login here by entering the username and password.

If admin enters wrong username or password the system cannot be accessed.

### B. Pending Reports:

Generated reports will be displayed with the initial status "Action Not Taken".

From the reports particular authority office get information about which area has more number of reports.

Depends on the priority and current National Highway authority can make the decision of which report has to complete immediately.

Highway Authority has access to change the status of the report. Highway Authority does not take any action, the report will remain in "Action Not Taken" state.

### C. In Progress:

This module contains the information about all actions that's are in progress status.

Action belongs to the report takes long period of time to complete, Highway Authority can change the status of the report to “In Progress”.

High Authority can hold maximum five reports in progress state.

**D. Completed:**

Once the action related to the report was done Highway Authority move the report to “Action Taken” state.

In this module Highway Authority can get the knowledge about how much reports were completed through this application. Repeated maximum number of status was taken as the actual status of the report. User can able to change the status by anytime.

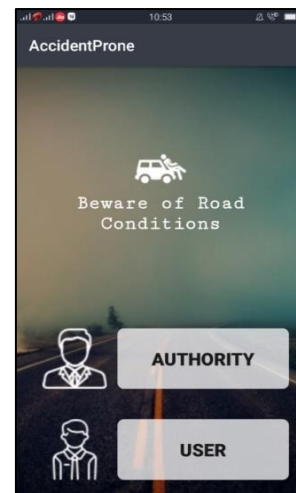


Fig. 1: Modules

**IV. BLOCK DIAGRAM OF PROPOSED SYSTEM**

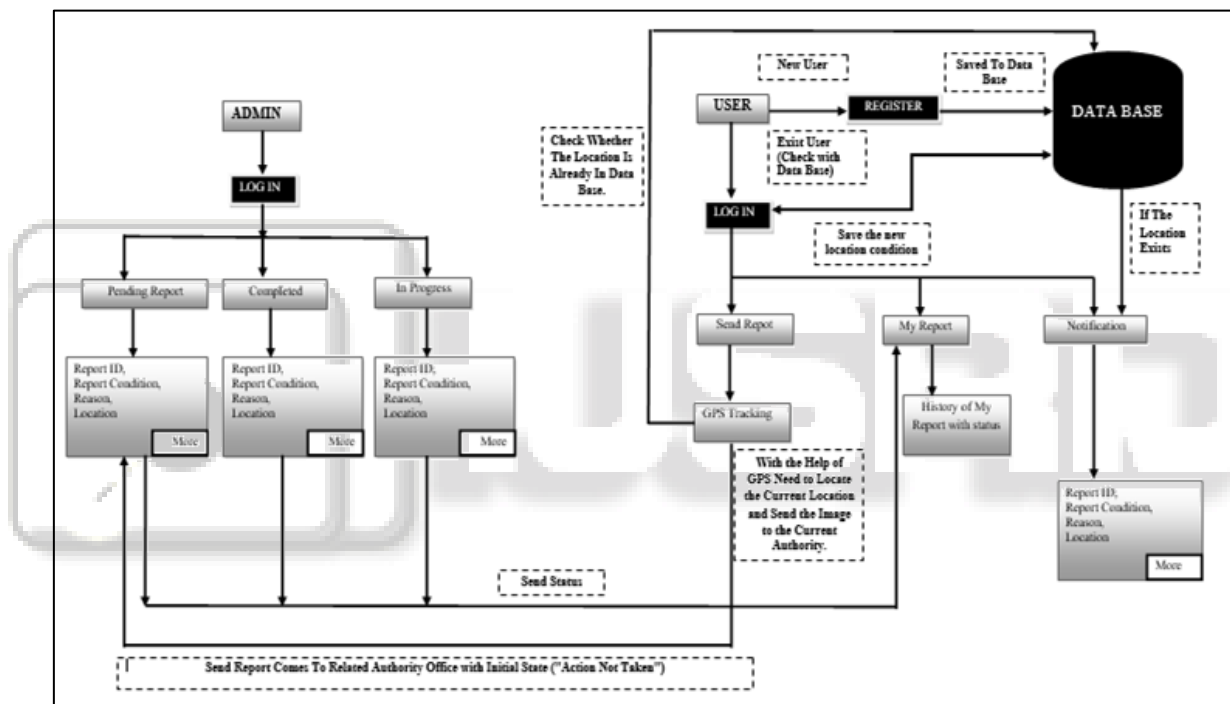


Fig. 2: Block diagram

With the proposed system shown in the fig. It helps the road users to report the Highway Authority about the condition of the road like dangerous turns, accident spots and bad condition of the road. Using this application the user can also upload the photo of the road and report it to Highway Authority.

As soon as the Highway Authority receives the report from the user, the Authority takes the necessary action for the report sent by the users and the authority can also take a snapshot of the road and send to the user. When the road users using this application comes across the location that is already reported, the user gets an alert notification before 800m about the condition of the road and the speed limit the user should ride.

**V. SYSTEM DESIGN**

System design is the creation of road map that shows system developers how to convert system requirements into a

workable and operational system by exploring system and identifying the best design for the project.

**A. Logical Design:**

Logical design identifies the record and relationship to be handled by the system. It focuses on the logic, or the reasoning, behind the system by breaking down the system into subsystem until the process cannot be repeated any further.

The Centralized project / identification of accident prone system is designed with the logic given by the requirement and the database is designed to retrieve of data from the database for Highway Maintenance Authority Office.

**B. Physical Design:**

The physical design is a transformation structural component into a procedural description of the projects. It also describes the creatures of the system, the components or elements of the system and their appearance to the user.

The physical design of the application shall also ensure the communication to the road user about the Action Taken by the Highway Maintenance Authority and also an easy way of adding the road users into the database.

### C. Input Design:

The collection of input data is considered to be most expensive part of the system design. The main objective of input design is to produce output in neat format and get high level accuracy.

In this project username is get from the road user in login page by using textbox, after that user can give information about them in corresponding form fields.

### D. Output Design:

Output design generally refers to the results and information that are generated by the system for highway maintenance authority office and road users. The output is designed in such a way that it is attractive, convenient and informative.

Forms are designed with various features, which make the console output more pleasing. In the highway authority form, the officer selects the location and sees the bad road conditions near to their location.

According to the location, they can easily ready the bad condition roads and sent back to user who sent a report.

As the output is the most important sources of information to the users, better interactions between user and highway office should improve the system's relationships for better use and also will help in decision making. Form design elaborates the way output is presented and the layout available for capturing information.

### E. Database Design:

A database design is must for any application developed especially more for data store projects. Since the reporting method involves storing the message in the table and produced to the sender and receiver, proper handling of the table is a must.

A database design contains the repository of highway maintenance authority office electronically stored data. Database are designed to facilitate reporting and analysis.

### F. Technical Steps:

Setting up the environment on our own computer. This phase involves installation of Java JDK, JRE, Android SDK, and Android studio 3.0.1.

Creation of GUI / Show details/ Add details and create activities linked with each other.

Retrofit network library and volley library are used.

Design APIs for communication between server and Android smart phone so that the database can be easily modified.

Android Application Test setup process-Run .apk file and test the application on your android smart phone.

## VI. SYSTEM ANALYSIS

### A. Existing System:

In Existing system, Accidents and road conditions are informed through Phone call only. People cannot able to know whether the action is taken or not. Communication between people and highway authority is not proper in the

existing system. To overcome all these problems a new system is developed.

### B. Drawbacks of Existing System:

There is no proper communication between people and highway authority. People cannot know whether the action is taken or not.

### C. Proposed System:

In proposed system a new application is developed to build a communication between people and highway authority. Using this application people can complain about the bad conditions of the road. They can also know whether the action is taken or not. While travelling users will be notified about the road condition if any reports are available in the database.

### D. Advantages of Proposed System:

Users can know whether the action is taken or not.

User will be notified about the condition while passing in that way.

## VII. RESULTS

This implementation is done on the server and Android smart phone. Implementation on the server is done using Retrofit network library and volley library, while the implementation of android smart phone is using Java. The application is tested on Android smart phone version Lollipop 5.0.1

The following are some module snapshots.

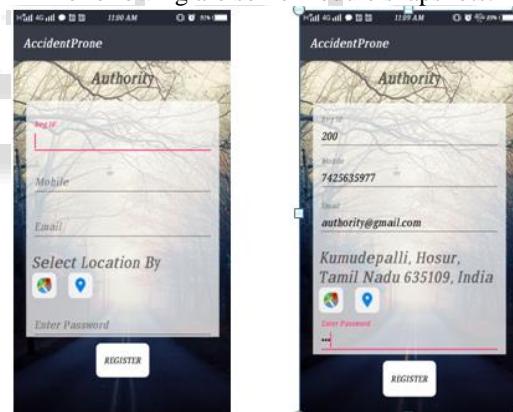


Fig. 3: Authority Module Registration

Fig.3 Authority registration module. In this module the Authority in a particular location registers by giving their Regid, Mobile number and the current location and Password of the Authority

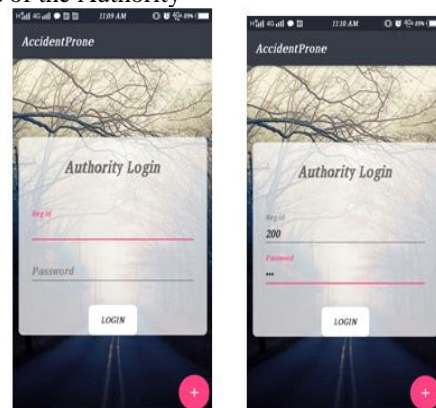


Fig. 4: Authority Module Login

Fig.4 Authority login module. In this module the Authority after registering can login to the application by

giving the registered Regid and Password.

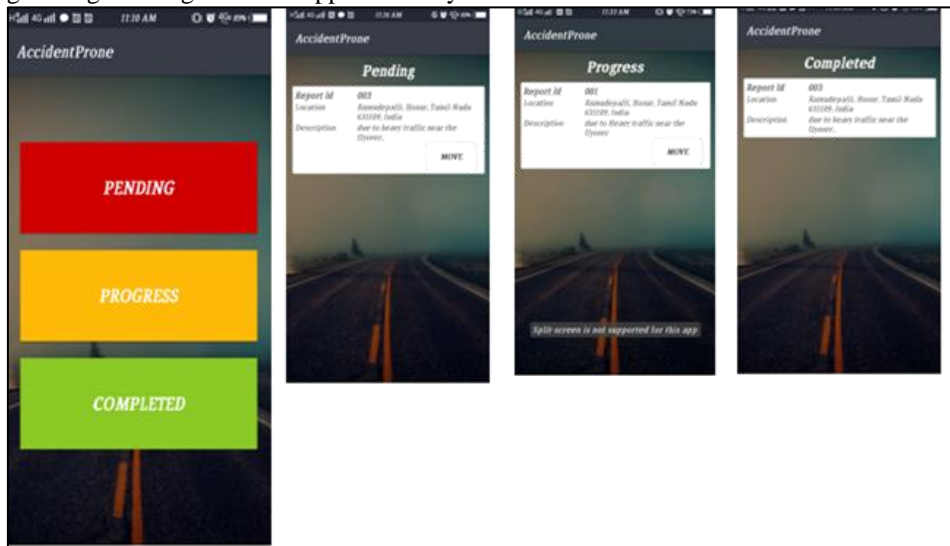


Fig. 5: Authority report notification

Fig.5 Authority can view the reports sent by the road users regarding the condition of the road and the Authority can take necessary action for the report sent.



Fig. 6: Authority final report

Fig.6 report after taking the necessary action for the report sent, the authority can take the snapshot of the completed road and update the status so that the road user will know whether the action taken is completed or not.

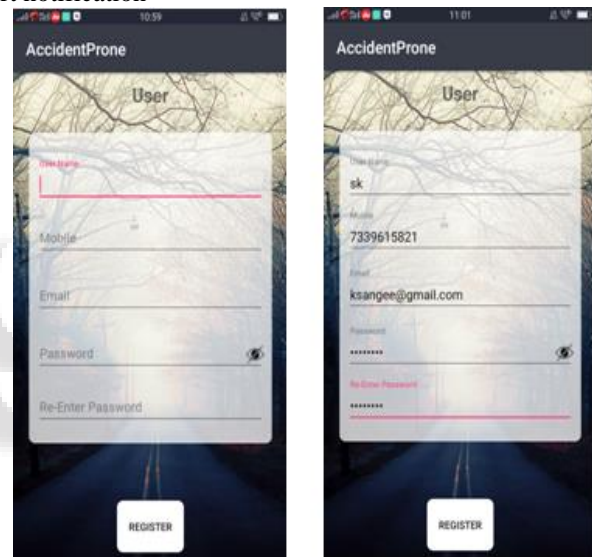


Fig. 7: User Registration module

Fig.7 the user should register with the application by giving Name, Mobile number, Email ID and Password.

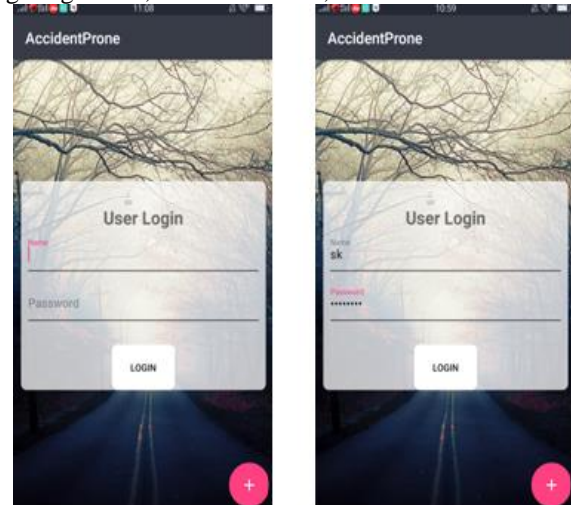


Fig. 8: User Login Module

Fig.8 after registering by giving the necessary fields the user now can login by giving their Name and Password.



Fig. 9: User Report And Status Module

Fig. 9 after logging in the user can select whether to report to the authority or to view the status of the previous report sent.

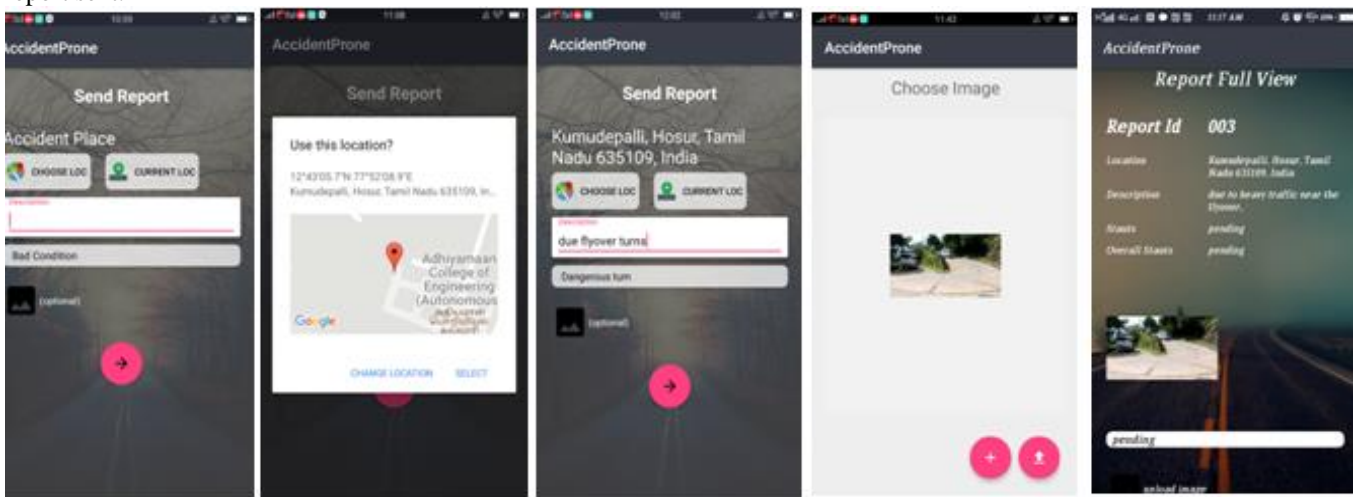


Fig. 10: Report send module

Fig.10 if user selects the report then they can send the report to the authority by selecting the location, and by giving the description about the condition of the road and they can even upload the condition of the road if necessary.

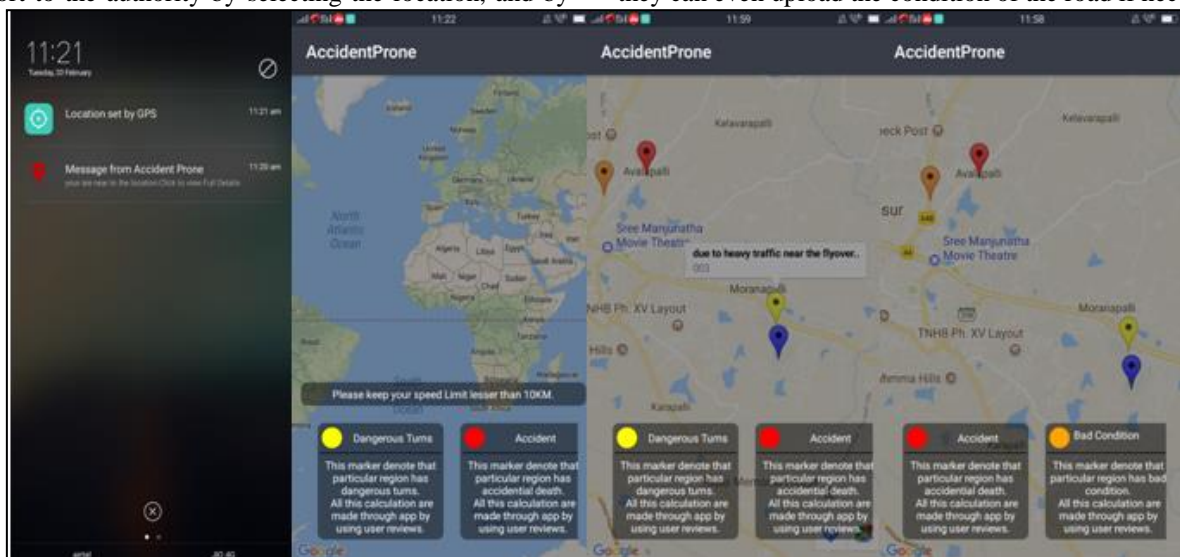


Fig. 11: Notification Module

Fig.11 when the condition of the road is already registered then other users when their data and location is on and when they cross the particular road before 800km they be notified by a message about the road. When the users

opens the notification they can know in what speed they should travel and they can also view the report that is registered and can give their opinion..

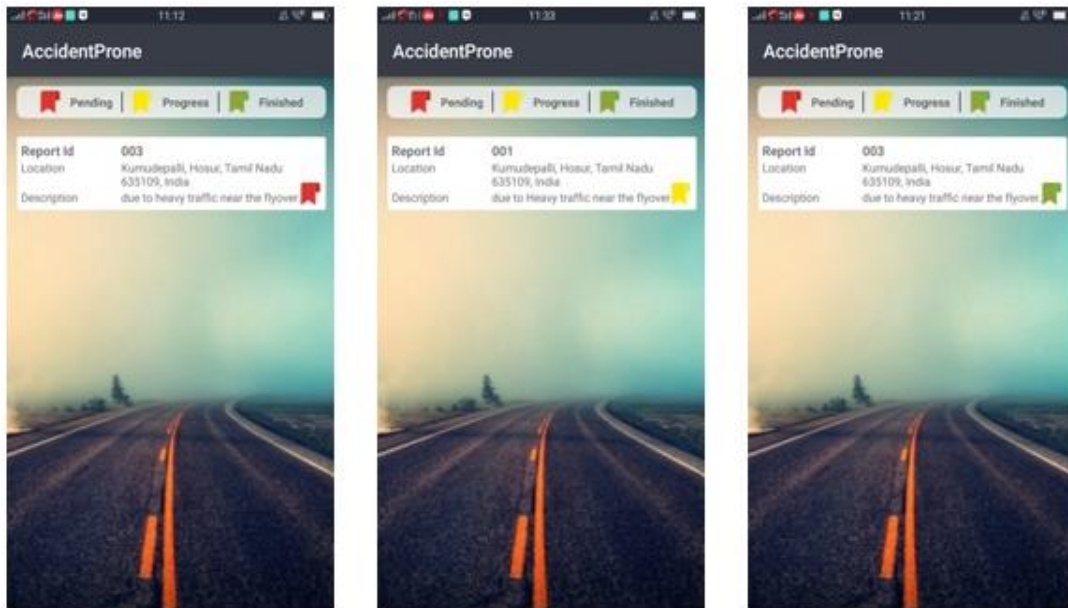


Fig 12. Status Module

Fig.12 if the user wants to view the status of the report that was sent can view this module where, the user comes to know whether the necessary action is taken by the Authority or not.

#### VIII. CONCLUSION

The road users using this application can send reports and the snapshot about the road condition like accident spots, bad condition of the road, dangerous turns etc., to the Highway Authority. The road users will know whether the action is taken or not by the Authority for the report that was generated by the user. This application is developed to build a communication between the user and the Highway Authority. If the user is already registered with the application, when the user crosses the particular location that is already reported to the Authority then the user gets a notification about the condition of the road.

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