

Marg-Sudhar : Pothole Reporting System Using Android Smart Phone

Riya Agrawal, Payal Patel, Yash Telang, Ankita Bhandarkar, Irfan Mushtaq, Dr. S. V. Sonekar

Department of Computer Engineering, JD College of Engineering and Management, Nagpur, India

ABSTRACT

Marg-Sudhar: Pothole Reporting System is a mobile application for detecting and reporting road condition. Dangerous road surface conditions are major distractions for safe and comfortable transportation and therefore road damage needs to be reported by locality. Data can be gathered by clicking image to identify potholes and other severe road surface anomalies using geotagging technique and upload on the server.

Keywords : Potholes, GPRS, Geotagging, Road Maintainance, Strategy i.e. Click, "Report" and "Fix".

I. INTRODUCTION

One major problem in developing countries is maintainence of road. Since India is a developing nation there is a constant demand for good quality infrastructure, transportation and services. But since India is a huge country with quite a sizable population this problem still has not been addressed in totality.

In order to improve the conditions of roads efforts began way back in the 1980s. It is during this time that roads were built to link major highways, to expand the width of existing roads and to construct important bridges.

Most roads in India are narrow and congested with poor surface quality and road maintenance need are not satisfactorily meet.

Our topic basically concerns about the safety of road users. Potholes, formed due to heavy rains and movement of heavy vehicles, also become a major reason for traumatic accidents and loss of human lives. As it is seen that many disasters occurring on road are

caused due to potholes and government authorities try hard to fix each and every pothole but due to large amount of roads in India it has become rather difficult to locate each and every pothole and get it fixed.

So to reduce time consumption in visiting the sites the describe system can be use to directly report to the highway Authority about the potholes with the help of android based application. By this a lot of time gets reduced of authorities and they get information about the where about of potholes and the preventive measures can be taken on time and a lot of casualties can be reduced from occurring.



Fig. 1. Condition of roads with potholes

II. PROPOSED SYSTEM

Marg-Sudhar is a android based mobile application for reporting potholes and various road anomalies.

It works on strategy that is “Click”, “Report” and “Fix”. Using app Marg-Sudhar users can click picture which use geotagging technique along with description and this information gets uploaded on server.

The pothole information obtained from pothole reporting system is sent to server and can be applied to a pothole alert service and road management system. All uploaded information are shown as a list view on client side. Also, the obtained pothole information is provided to Road Management System.

III. IMPLEMENTATION

Marg-Sudhar has been implemented using following technologies (1) Android (2) Java (3) SQL (4) Geotagging (5) Web Technologies.

(1) Android:

Android studio is the IDE for google’s Android OS build on JetBrains’ IntelliJ IDEA software and designed specifically for android development. The following features are provided in the current stable version: Gradle-Based build support, Android-specific refactoring and quick fixes, template-based wizards to create common android designs and components, a rich layout editor that allows user to drag-and-drop UI components, build-in support for google cloud platform, enabling integration with firebase cloud messaging and google app engine.

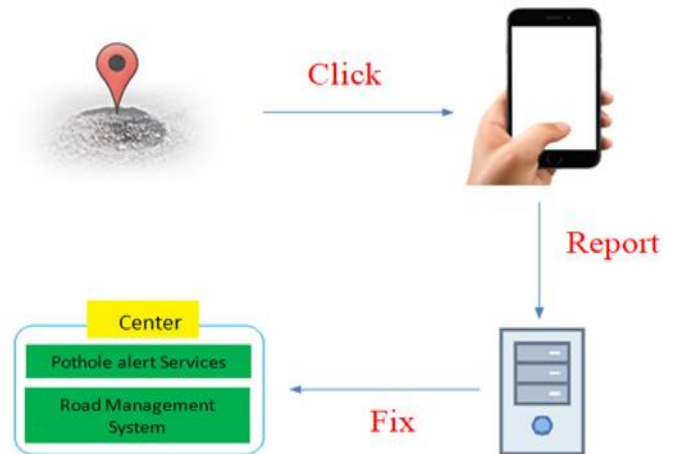


Fig. 2. Pothole detection system and its application

Application has been implemented on following android features:

- For designing part various activities and their components are used.
- Communication between activities has been implemented using Intent object. Intent is an messaging object use to request an action from another app component.
- Components registration, is an entry point through which the system or a user can enter into app.
- Also, various background services rights has been used.
- This application needs various build app access rights such as: Storage, Camera, Data access, Internet access, GPRS access.
- Data is Authenticated due to security purpose at various point such as at time of login.

(2) Java:

Java is an object-oriented, class-based, concurrent, secured and general-purpose computer-programming language.

After front-end elements are finalized java classes and packages are use to make them work.

(3) Database:

A database is an organised collection of data, generally stored and accessed electronically from a computer system where databases are more complex they are often develop using formal design and modelling techniques.

Android comes with in-built SQLite database. SQLite supports all the relational database features.

(4) Geotagging:

Geotagging or GeoTagging, is the process of adding geographical identification metadata to various media such as a geotagged photographh or video, websites, SMS messages, QR Codes. This data usually consists of latitude and longitude coordinates, though they can also include altitude, bearing, distance, accuracy data, and place names, and perhaps a time stamp. There are two main options for geotagging photos: capturing GPS information at the time the photo is taken or "attaching" the photograph to a map after the picture is taken. In order to capture GPS data at the time the photograph is captured, the user must have a camera with built in GPS or a standalone GPS along with a digital camera.

IV. WORKING

Marg-Sudhar: Pothole reporting system is implemented into two modules: (1) Client side, (2) Server Side.

(1) Client Side:

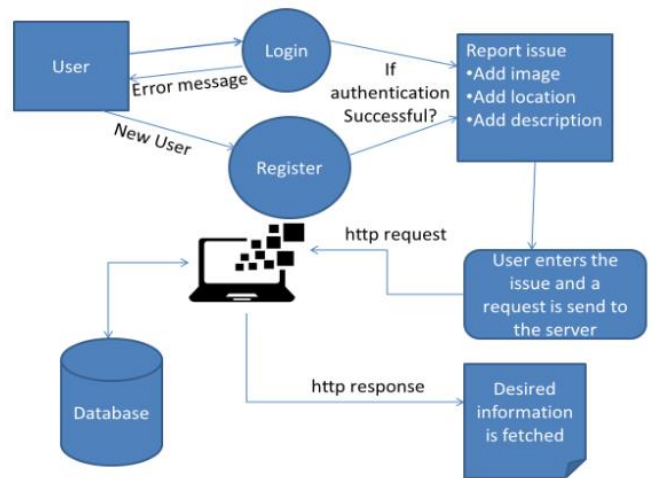


Fig. 3. Client Side Working

Client side involves user interaction. Using app user can login/ register. If user gets successfully login or register they can click image of pothole. The snapped image is automatically geotagged with latitude & longitude using GPS and GPRS. This image is sent on server along with some description added by user. Additionally, user can also see lists of complaints added by other users and their status.

(2) Server Side:

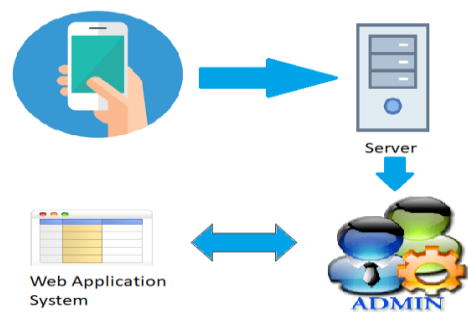
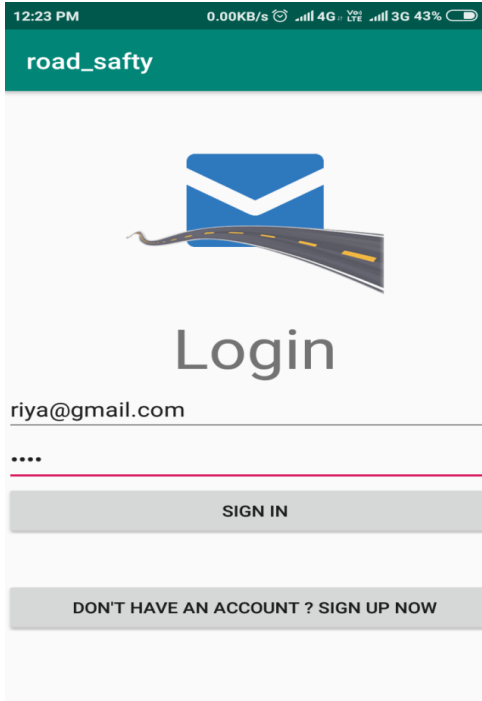


Fig. 4. Server Side Working

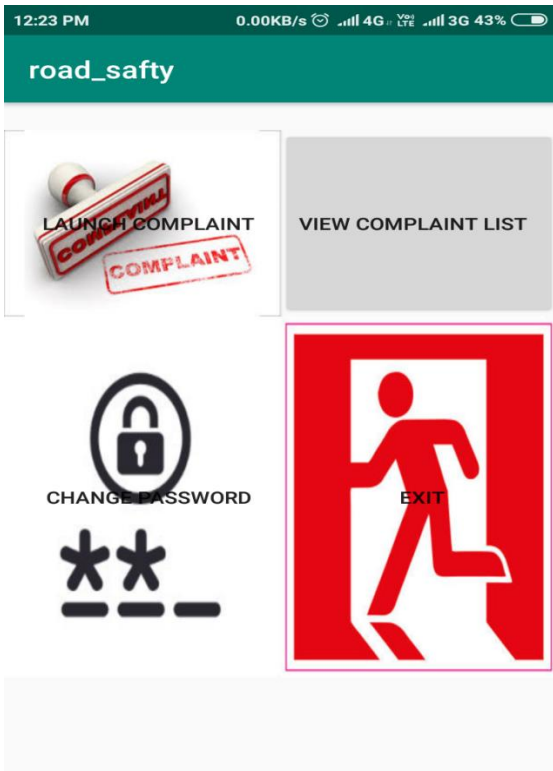
Image via app is uploaded to web server and complaint is stored on server for further processing and authenticity. Also admins get all the privileges through this server. Confirmation SMS and continuous status for these complaint are send to uploader.

V. APPLICATION LAYOUT

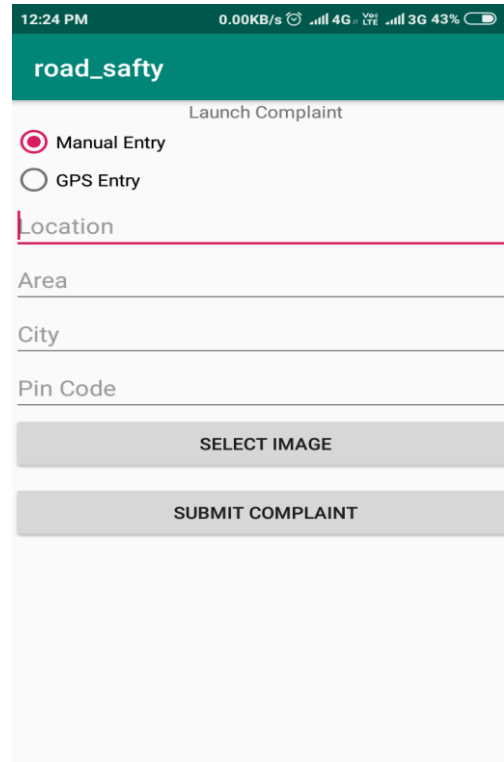
(1) Login/ Registration screen:



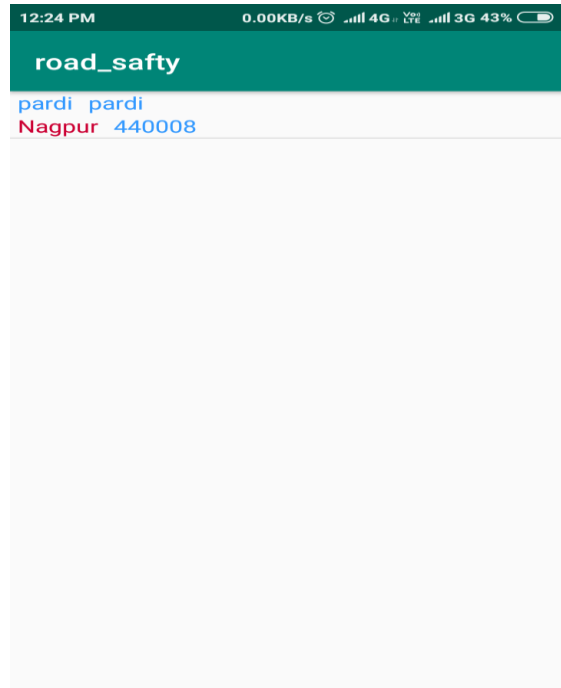
(2) Home Screen:



(3) Launch Complaint:



(4) List View:



(5) Server:

Complaint Name	Email Address	Address Line 1	Address Line 2	Address Line 3	City	state	pin_Code	Admin Remark
vj mal	uj w gedam@yall.com	abc	abc	abc	abc	abc	123456	done
salem	saleem@yall.com	abc	abc	abc	abc	abc	123456	noooo
sdsd1	sdsd2	sdsd3	sdsd4		sdsd5	sdsd6		
sdsd1	sdsd2	sdsd3	sdsd4		sdsd5	sdsd6		
vj aj	vj	aaa	bbb		ccc	ddd	eee	uj weak
salem_khan	saleem@tel.com	chhaoni	sadar		nagpur		450010	
salem_khan	saleem@tel.com	gff	ggg		j b		66006	
vj aj	vj	uj w k	uj w l nagar		vj gg		1234	uj weak
salem_khan	meet.saleem.khan@gmail.com	aaa	bbb		ccc		6666	
salem_khan	meet.saleem.khan@gmail.com	mumbai	janbul		dehra		3443	
vj aj	vj	saleem	saleem		saleem		12345	
vj aj	vj	axes	axes		mumbai		400067	
vj aj	vj	abcv	xuz		adc		123	
vj aj	vj	rgh	xch		xvbn		4566	
vj aj	vj	adgh	sfg		ere		22345	
vj aj	vj	ere	rrr		dgh		44504	

VI. ADVANTAGES & LIMITATIONS

(A) Advantages:

- It becomes easy for road maintainers as well as for locality to monitor the road condition.
- Smooth roads will lead to less vehicle damage and government investment.
- Rapid increase in the rate of Smartphone, users can help to identify Potholes easily.

(B) Limitations:

- To complain on real time basis an android mobile with GPRS connection is required.
- It is completely based on user interaction and requires good internet connectivity.

VII.FUTURE SCOPES

- Can be implemented in cities under Municipal Corporation.
- It can also be implemented in automated manner using GPS sensors on vehicle
- Further research is necessary for improvement in image processing.

VIII. CONCLUSION

Marg-Sudhar will enable road maintainers to obtain information regarding road condition easily with the help of locality. Through this it will reduce time of Municipal corporation in gathering information and locality will get better roads in less time.

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X. REFERENCES

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