E-Community

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I. Abstract

The growing use of smartphone and with that the Internet is making it increasingly possible to ensure connectivity of all the Indian citizens. An android application is the most user friendly and easy way to reach a wide audience. In this application, every user will be able to post a problem or a solution to a common problem in from of events, drives, etc. These posts will be mapped to a Lok Sabha constituency that it belongs to using the location of the post. The Map of India will be logically divided into Lok Sabha constituency of all the cities using the co-ordinate data which will be derived from the physical location and geometries of the Indian constituencies. All the users will be able to see all the posts in various different constituencies. Users now can post area specific problems they face in their day to day life to a target audience of all the people in his area only. Users will be able to up-vote/down-vote a particular post and this will help everyone of the same area to understand the common problems faced by each other. People can also create awareness about some wrong doing that is happening in their area and can also suggest solutions if any that can be solved via easy collaboration with people living nearby. This application will strive to achieve strong hyper-local connections in a community and ensure that every citizen is represented at the most micro level possible.

Domain: Android Application, Mobile Computing, NLP.

Keywords: Android, PHP, Indian Constituencies, Application, NLP, Algorithms.

II. Literature Survey

So many problems arise in the day-to-day life of the citizens of India. Yet despite the problems faced by many only a few rise up to find a solution to the common problem. In this world of Internet and mobile devises, there is no effective solution on the cloud to collaborate the people of a constituency to come together and solve the problems with or without the help of an NGO or the government. The closest thing to this is Empowering India [1], an initiative that attempts to empower voters with information about their candidates, constituencies, and political parties. The objective is to encourage citizens to actively participate in the democratic process, as well as promote transparency and accountability in politics.
Empowering India is an outcome of a realization at the Liberty Institute that good public policy ultimately originates from a better understanding of the processes that shape democratic politics and influence governance. It largely depends on you contributing more information to the site, informing about the latest developments in your constituency, helping to compile various forms of data, and using the information for dissemination and/or analyses.

However this has a number of limitation:

- Main focus is on the election candidates, results and informing the user.
- It is not feed based-Comments are not sorted according to timestamp, no up vote, down vote option available.
- Does not have strong spam policy.
- No intuitive User Interface.
- All categories of problems (issues) are static.
- There is no way to find a solution to a problem on the website.

To overcome this and bring the people of the constituency together, we have implemented an android application for the effective collaboration of the people in a constituency.

The project is about connecting the citizens of a particular locality using a location based mobile platform so that they can share their problems and try to find effective solutions for their problems with collaboration of one another within one's constituency.

The problems will include all the day to day issues like water, traffic, electricity etc. to issues like corruption, illegal activities and many more. Along with that a user will be able to see the most relevant problems of the locality that the user belongs to. The relevant problem for a locality will be decided by multiple parameters like the number of users supporting the problem, how recent the problem is. The users will also be given scores on the basis of their activity on the platform so that credibility can be maintained.

The project will have a location based feed where the users can up-vote or down-vote a post. More importantly posts will be floating on top of the feed and posts with more support will be escalated as a national problem in the national feed visible to all. The app will use NLP to categorize to new written posts automatically into categories and the similar problems will be shown to the user before posting it.

This project will facilitate the communication of the people living within a constituency to come together and solve all the common problems.

In this thesis, we are implementing a model to develop the above android application. This method has various steps that we have proposed.

1. Data Collection: We have collected the data comprising of the co-ordinate of each constituency along with the physical geometry and location.

2. Data Integration: After collecting the data, the data is cleaned by applying various algorithms and it is integrated, removing incomplete, inconsistent data

from the data sets. All the databases are set up on the server.

3. Server Side Scripting: After collection of the data, this

data will be used to create the server side APIs which will be used to serve the HTTP requests of the client application.

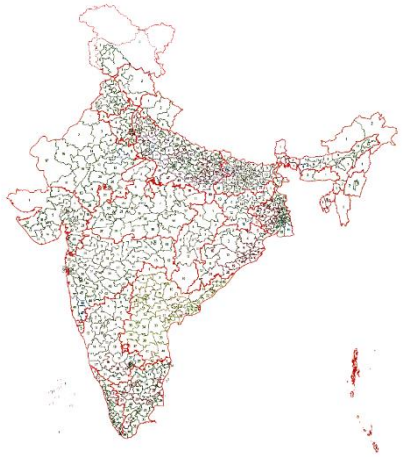
4. Client Side application: Now all the server APIs are done, the client android application will be developed using the Android Studio which will be using JSON asynchronous calls to the server APIs for dynamic feed implementation.

5. Intuitive UI/UX: After the basic client server implementation, our focus will be shifted towards making the user experience better by implementing an intuitive UI.

Following this method we will have done developing the android app for the common welfare of the people.

III. PROBLEM DEFINITION

Owing to the faults of the existing system the new proposed system is as follows:
Our application will enable the users to post various problems that they have about their locality to others and will also help them to engage to solve their pressing issues. Users can also post philanthropic services/drives to be hosted in the locality so that there is effective collaboration from the community.
Our aim is to provide a platform where users can interact with



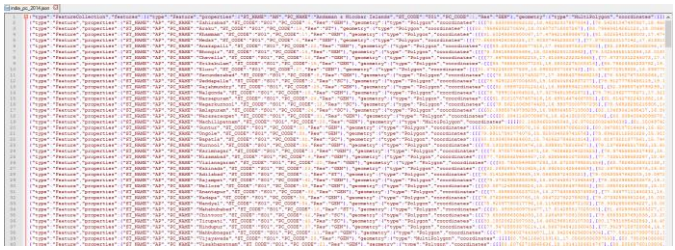
their fellow citizens to find and solve the pressing issues of the society as well as create awareness.

A. Data Collection and Data Integration:

This image of the Indian parliamentary constituencies consisting of the physical geometries of the same is downloaded from Wikipedia.

Using this image and the software called Map Tiler, polygons are approximated and the co-ordinates of each polygon are noted manually and loaded into a JSON file of further use.

The JSON data is used in the server-side script to dynamically assign a post to the appropriate constituency based on the longitude and latitude provide by the user device or map.



The longitude and the latitude of the user post's location is compared with each polygon of the state and the appropriate constituency is mapped. This is done by using Point Inclusion in Polygon Test by W. Randolph Franklin.

Pseudocode:

```
int pnpoly(int nvert, float *vertx, float *verty, float
testx, float testy)
{
  int i, j, c = 0;
  for (i = 0, j = nvert-1; i < nvert; j = i++) {
    if ( ((verty[i]>testy) != (verty[j]>testy)) &&
           (testx < (vertx[j]-vertx[i]) * (testy-verty[i]) /
           (verty[j]-verty[i]) + vertx[i]) )
      c = !c;
  }
  return c;
}
```

After the constituency data is done, the entire databases are set up on the MySQL server and the MongoDB server.

B. Server-Side Scripting:

This phase is the crucial as the entire processing will happen on the server and accordingly the response will send by the server to the client android application.
PHP is the language used for server-side scripts. The server will be Apache server. The APIs will communicate with the databases and the client android application.

C. Client-Side Application:

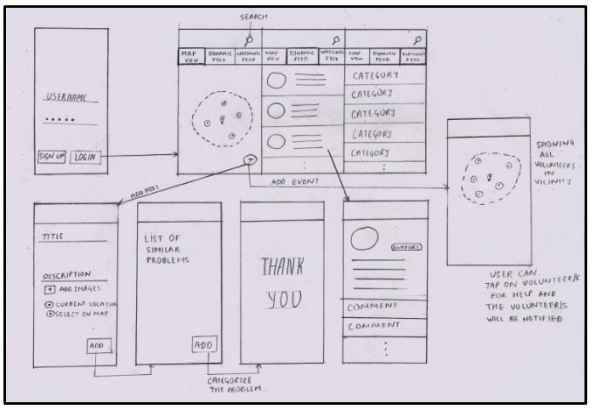
After all the server APIs are done, the client android application will be developed using the Android Studio which will be using JSON asynchronous calls to the server APIs for dynamic feed implementation. Java is the main language used for the development of the android application.

D. Intuitive UI/UX:

After the basic client server implementation, our focus will be shifted towards making the user experience better by implementing an intuitive UI.

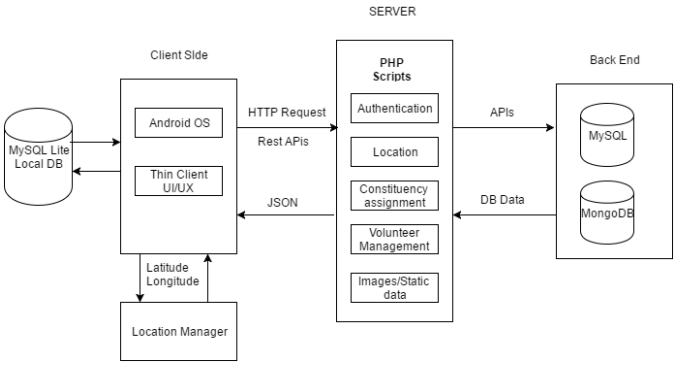
Once the program has been launched, the user will interact primarily with the Android device running the application. Since the program will be designed with simple mechanics and ease of use in mind, the GUI need not be overly complex. The interface will be very intuitive and interactive so that it is very easy for the user to use the application. Whatever interface is used should in fact be kept readable and minimalist in order to accommodate the smaller screen size of the Android device.

1. Login Screen
2. Home Screen
3. Posts Screen
4. Map view of the problems in the locality
5. National problems screen.
6. Map view to locate the dynamic volunteers



7. Volunteer portal
8. Talk of the day Screen
9. Survey Screen
10. Help Screen

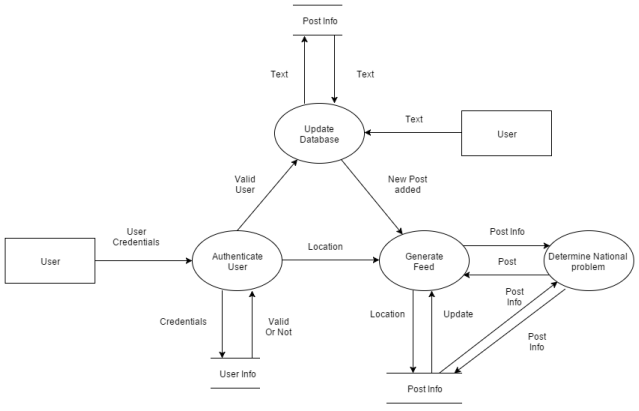
IV. ARCHITECHTURE WITH MODULAR DESCRIPTION



Architecture of the System

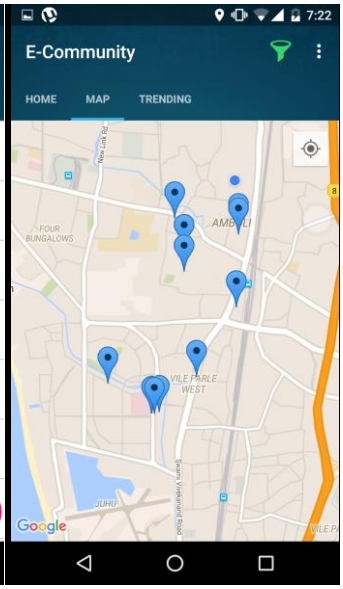
Modular Description:

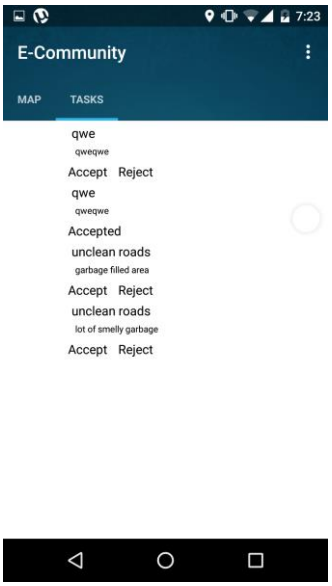
- The user will have to login using a username and password with which the user will be able to see the problems, up vote, down vote, post anywhere based on their location.
- The user will be able to write new posts about the problems and for every new problem there will be a new thread on which the users will be able to discuss about the problem at hand also they will be up voting and down voting these posts.
- Based on the location co-ordinates of the user, the post will be mapped to its respective Loksabha constituency.
- These posts/problems will be categorized into their specific categories based on Natural Language Processing.
- While posting a new problem, all the similar problems in the locality will be shown to the user via NLP, so that the user is aware of a similar post and the user can choose not to post his similar post.
- To assure that the user does not post content that is irrelevant in context to this app, a predefined list of keywords are used and the keywords that are obtained via NLP do not match the list will be considered spam.
- Now based on a few parameters the users will be shown a dynamic feed in which the most relevant problems of their locality will be shown to them.
- The users will be shown trending topics using an algorithm which functions by taking a token count and item frequencies of real time data and based on a set threshold value, trending problems of a locality will also be detected.
- Along with local community feed shown according to the distance, there will also be a national feed to which all the escalated and common problems/ services will be confined to and visible to the entire country.
- Along with the posts the user can initiate collaboration amongst his locality by creating an event as a part of solution to a problem as previously discussed. After creating an event the user will be shown a map view shown all the volunteers in the vicinity. The volunteers and the user's location will be dynamic in nature and will be updated at a certain interval of time. The user can tap on a volunteer to send a push notification asking for help.
- Similarly all the volunteering users can themselves provide support to a problem/event in their vicinity and earn respect points among their peers.
- The users will be able to search for posts, constituencies or categories/topics and also filter accordingly.
- There are going to be other features like surveys, polls, talk of the day etc. to keep the users more interested.

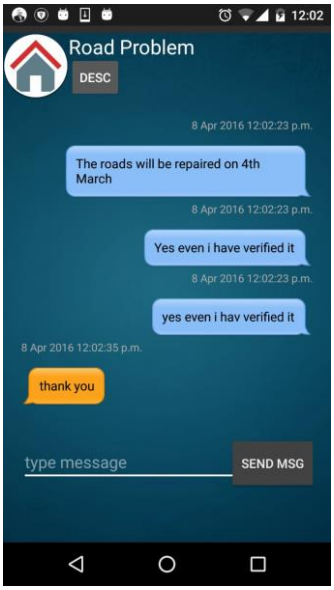


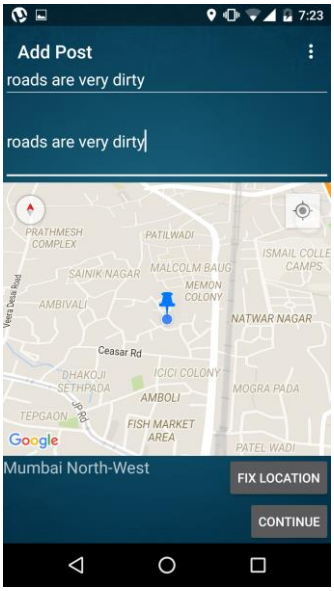
The above Data Flow diagram shows the fundamental working of the application.

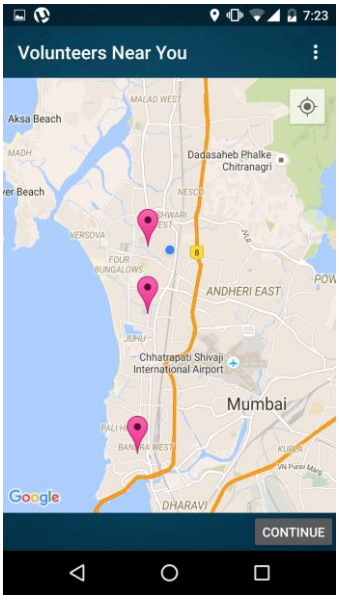
V. SCREESHOTS

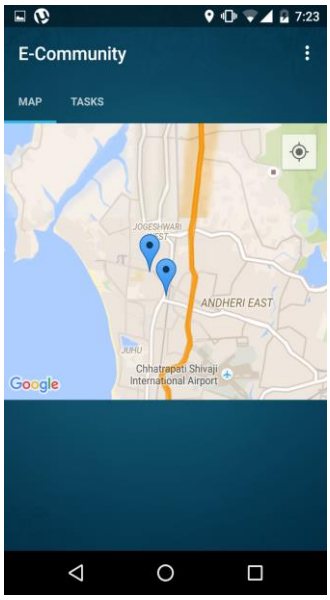












VI. BENEFITS

The proposed system will have a very intuitive and an interactive user interface that will help the users to easily navigate through the application with ease.

- **Connectivity**- To connect all the people of the same locality sharing the same concerns and problems enabling them to find a mutual solution if possible.
- **Information**- People are generally not aware about what is happening around them, in the neighbourhood, now possible to get real time on the go information about any recent development in the user's locality good or bad.
- **Better understanding and Communication**- Users are connected at the micro-level thus any problems, information, creating awareness are possible at the tip of fingertip.
- **Collaboration**- A huge impetus can be given to social initiatives where a user can volunteer to help and contribute to his locality in a more organised fashion as user now understands which problems in his locality are of the highest concern. Users can also urge other users digitally to help for a cause.
- **Awareness**- With real time updates it is possible that every user will be more aware of what is happening in his neighbourhood, various government initiatives for the betterment of the people, which are not highly advertised can now easily reach every household. Awareness about any wrong doing can also be created which will in turn help create a safe neighbourhood.
- **Active User Involvement**- The users will also be able to up vote or down vote a problem so as to know that how many users of the locality share the same problems.
- **Constituencies**- We have used the parliamentary constituency so that the posts can be mapped to the respective constituency making the data structured. Also the government can use the data to increase accountability and correspondence with the people.

- **Categorization**- The categories of the problem that the user will be posting will be found out at run time using Natural Language Processing thus enabling the user to post anything without worrying about the categories in which their problem falls.
- **Dynamic**- All the most relevant problems of the locality will be showed in a dynamic feed that will use up votes, down votes, location, timestamp and other parameters which will help the users to quickly browse through the latest happenings of their locality.
- **Android**- Since a lot of people have android devices many people will be able to use the features the application provides. Also they will be able to use the application on the go.
- **Cloud**- Since the data that will be generated will be huge using cloud will help scale as per the growing needs of the application.

VII. EXPECTED OUTCOME

Our project is about connecting the citizens of a particular locality using mobile platform so that they can share their problems and try to find effective solutions for their problems with collaboration of one another.
At the end of the project cycle a platform will be delivered compatible with android initially. The initial build of the project may not be able to scale to increased number of users as a trial version of a public cloud will be used. To scale the team will need to raise sufficient amount of funds to rent a private cloud. This project will facilitate the communication of the people living within a constituency to come together and solve all the common problems.

VIII. FUTURE SCOPE

The application will be made interoperable, that is it will be supported by all the other operating systems. The algorithms will be optimized for better user experience. Various semantic and data mining algorithms can be implemented for better analysis and results. The application will also be made multi lingual. The security of the application can be enhanced by using various authentication and cryptographic algorithms on the JSON data. The servers can be upgraded to meet the growing demands. The government can also be integrated to improve accountability.

IX. REFERENCES

[1] EmpoweringIndia: http://www.empoweringindia.org/new/home.aspx

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