On the Spot

Team-20

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Abstract—**Many of the problems in society, trivial or non-trivial, go unreported behind the veil of ignorance or lack of knowledge of responsible authorities. Most of the departments in our modern society have defined SLAs for their operations but the corrective action is delayed because of lack of a solid platform to report such incidents to the authorities. "On the Spot" is a solution to this problem as it will serve as a platform to report such problems without prior knowledge of responsible authorities. It is a mobile application which is simple enough to be used by the mass with minimal steps to follow.**

I. INTRODUCTION

Currently, every developing economy is up to a mission to develop smart cities all over the country to create a citizen friendly and sustainable environment. This campaign includes modernizing the cities and their processes to make them satellite towns of larger cities. One of the aspect is how to report issues and concerns in a smarter way. The current setup either does not have any such reporting tool or have form based legacy systems. The system needs an upgrade in this area by creating a modern application to report issues which are always ignored. The corrective actions will be done on timely bases if the concerns could be escalated on time. "On The Spot" mobile application becomes handy in this case. It is a reporting tool which will engage customers in submitting their concerns to the appropriate authorities without any prior knowledge. The system does not require any changes in how authorities receive their complaints and their ticket handling life cycle.

II. DESIGN CONSIDERATIONS

A. Intelligent System not triditional:

First and foremost, the system is designed to modernize how the concerns are reported to authorities. The application should be an intelligent system which involves decision making at various levels and should be able to handle the different scenarios smartly.

B. Easy to use:

As the target userbase is the common mass so application's interface design should be very simple, intuitive, and every age group should be able to use it without any problem

C. Accuracy in routing:

As the complaints will be directly forwarded to concerned authorities, so the chances of misrouting the complaint should be minimal as it would rather complicate the problem rather than simplifying it

D. Security:

As the application will be saving user information so the security of this information is critical. The application should not expose the public data open to any attack.

E. Complete information:

One of the biggest challenges for any reporting tool is how users could be engaged to get complete information regarding the concerned scenario. The tool should try to provide all the details in first go and minimize the customer hops.

III. IMPLEMENTATION

Considering all the factors, it was decided to implement the solution as an android application which will ease the distribution of application to common mass. The system dataflow could be easily understood by following diagram:
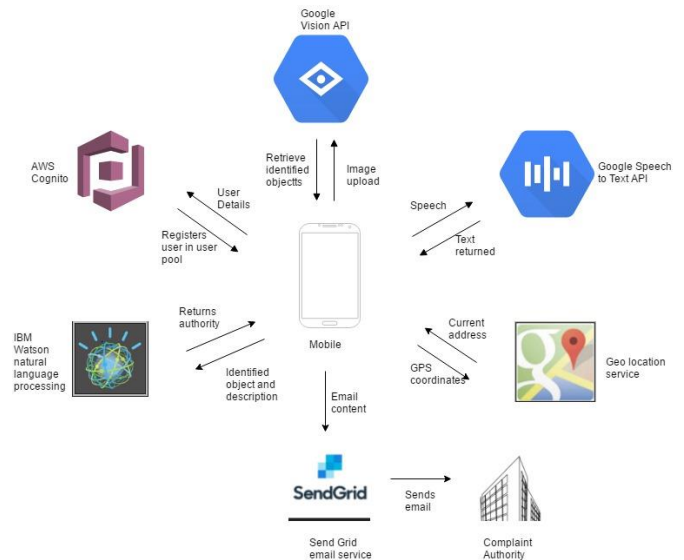
A. Login

The application requires user to sign-up and login into the system. We have used AWS Cognito service for maintaining the user pool and their information. Please find below the key points

- User need not log in every time when he uses the application. The sign in module checks the Cognito user pools for checking the identity and let the user in without prompting for login details.

- The user home page includes all the complaints which were raised by him/her. User could click on any complaint for its detail.

B. Vision

The Vision module prompts user to click a picture and identifies the objects in it. The object labelling feature of "Google Image API" is used to identify objects in the image. Then based on object selection, user is prompted for problem description.

C. Speech

The Speech module is responsible for getting the complaint description. User can also say the description rather than typing it. The object labelling feature of "Google Speech API" is used for getting the speech input.

D. Location:

The module gets the current location of user and covert the latitude and longitude into address. "Google Location API" and "Geocode service" is used to get address of the user. The zip code is used to bucket the complaint to correct authority.

E. Natural Language Classifier:

The module feeds the complaint description into the "IBM Watson Natural language Classifier service" the service will return the authority based on the object and description. Further, based on the current location's zip code, the complaint is forwarded to authority of that place only.

F. Email:

The module gets the registered complaint from storage and forward the email to authority using the "Send Grid API". The forwarded mail has all the details and the captured image.

IV. SERVICES USED

S.No.	Module	Module
1.	Login	AWS Mobile hub with Cognito
2.	Vision	Google Vision- Object labelling
3.	Speech	Google Speech
4.	Location	Google location with geocode
5.	Natural language	IBM Watson natural language classifier
6.	Email	Sendgrid

V. SECURITY CONSIDERATION

Every service provider takes care of the security concerns and we did leverage all the facilities which were provided by vendors:

- **Amazon Cognito Service**[1] used for security principles and we are using one time password to authenticate the details of the user. If the user is not authenticated, then they would only be able to access the "public/" folder in the User Data Storage feature of Mobile Hub. It could modify the authorization policies in IAM to NOT allow use of the public folder by unauthenticated identities.

- **Google Vision API**[2] and **Google Cloud Speech API**[3] detects inappropriate content. Powered by Google Safe Search[4], Vision API enables users to detect different types of inappropriate content from adult to violent content. So, this was already handled for the application.

- **IBM Watson Natural Language Classifier**[5] is trained with proper datasets involving objects retrieved from Google vision API providing confidence levels and bypassing the inappropriate or trivial text in description.

VI. BENEFITS

The application has following merits on traditional modal:

- Today in this fast moving world, no one has ample time for filling tedious forms to log a complaint. By using "On The Spot", one can easily log a complaint by clicking the picture of the object with one line description.

- Secondly, this app eliminates the need of the single team which gets all the complaints and routes the complaint to outbound teams

- The applications UI is interactive and engages user better than legacy system.

- The modal has another variation which could be used for Lost and Found scenario.

VII. ACKNOWLEDGMENT

VIII. REFERENCES

[1] https://forums.aws.amazon.com/thread.jspa?threadID=253406&tstart=0
[2] https://cloud.google.com/vision/
[3] https://cloud.google.com/speech/
[4] https://support.google.com/websearch/answer/510
[5] https://www.ibm.com/watson/developercloud/nl-classifier.html