Police Man-Power Mobility and Control

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ABSTRACT

In our era of lighting speed communication and short texts, our generation is moving ahead with great speed. But with the advance in the tech even the crimes have increased. This paper proposes a mobile system which will help increase the efficiency of the traditional system. The proposed system will be centrally administered and using cloud the application will be all time available. The police personal will have this application on an android based phone & will be using the GPS of the phone for location updates. This system will increase the work force and man-power mobility during times like riots, agitations, or even the worst conditions like terrorist attacks.

General Terms

Citizen security, Smart city

Keywords

Cloud, GPS, Android.

1. INTRODUCTION

The current telecommunication providers have started proving services in even the most isolated areas, and with the recent launch of 4G [12] in many mobile phones, the communication network has exponentially increased. In the meantime the traditional police system is facing a hard time to manage its work force, and also be efficient and convenient for the public [1]. Nowadays since the Android phone have become quite a common sight, we will be implementing the system on an android phone. In this system a private & secure cloud [4] platform to store and process the data of the police officials, also will be using the GPS [5] to keep track of the location for the complaint.

In the proposed system's application, when a police installs the application, he/she will be given a specific credential unique only to him. The credential will be provided by the system administrator .Once logged-in his application will remain online in the back ground. The police official's data, like his police station, his rank, posting & etc. are all stored on the cloud. The station's in charge of the attendance periodically updates the number of men available in the station. The java application and the database will be stored in the cloud [7], because of which the data is available centrally.

In another scenario, wherein a police officer raises an alert and requests for backup. Here, the request is forwarded through the cloud to the authorized senior official [2]. The official will see the alert and using the same application he will assign certain task force from each station for that certain alert.

The other scenario, wherein specific officials have to be sent on the field to respond to an alert. Once the senior official has passed the number officials to be sent from a certain station, the station's officer in charge will use the application and

select the men to be sent to respond to the alert. Once the men are assigned the mobile application informs the users as to where they have been told to report.

Prior to all of these scenarios, an official in charge if the attendance [2] keeps periodically updating the attendance of the police officials in a certain station. If a police official has not marked his attendance before a certain time limit, the official will get a notification as to report and mark his attendance.

This paper proposes a system which overcomes the cons of the current traditional police system with the use of Cloud computing, android & GPS. These technical features will be the key players in the proposed system.

This paper's structure is as follows: - Section 2 will be based on the different functional modules of prime importance, Section 3 will be specifying the different personas who will use the application, Section 4 will contain the detailed scenarios of how the personas will function. Section 5 will contain the comparison between the traditional system and the proposed system, Section 6 contains basic dataflow, and Section 7 will contain the conclusion.

2. POLICE WORKFORCE MOBILITY SYSTEM

In this system the users will be connected to the database through a java application. The REST API will be used to communicate between the user's app and the Java app on the cloud. A figure ("Figure 1") representing the basic scenario is given below,
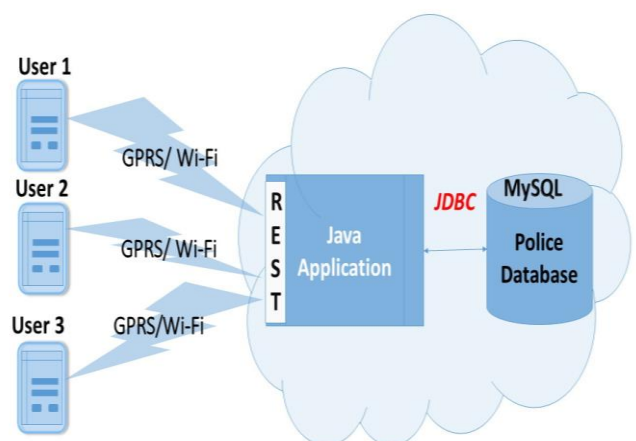

Fig :- 1 Basic Scenario of PoliceWorkforce Mobility System

2.1 Alert / Backup Force Module

This is the most important module in the application. This module will be responsible for requesting immediate backup,

or for sending out an alert and mention the work force that will be required to curb that alerted problem. The alert button will be present in every police official's phone. Where ever an official spots a situation that might escalate to a riot, or a situation that requires more force to solve, or even at the most crucial conditions when an official spots a terrorist activity, he will immediately enter the number of men required to take action against the problem and hit send. This will put out an alert notification on the senior officials phone, who will then sent the required amount of men to calm down the uneased situation. If in cases of a terrorist attack or any other major alert, the notification will be pushed to the main Head of the Police Dept. [2] in the respective city, he will then respond to the alert by assigning the number of men required for the job and even send additional forces from nearby areas.

2.2 Workforce Mobility
In every police station the attendance is taken periodically, and uploaded in the cloud sever [7]. This information of the available men in a certain police station is displayed when an alert is raised or when a backup force is called upon. When an alert is raised the required men is also specified in the alert, when the Senior Official [2] is responding to the alert, he/she will see the number of available men in the nearest stations and if those men aren't satisfying the requirement put forward, he can see the number of men in the neighboring stations, and assign those men too. He/she won't need to enter a specific number of men to be assigned, our system would be smart enough to see the requirement and send the complete force from a station with just one touch, and similarly if men from one station aren't fulfilling the requirements then the next nearest station's men are also sent, this continues till the requested number isn't reached. Here the senior official just has to select the station and the men from the station will be assigned. This way the workforce of the police force is maintained and the time spent in assigning the police force is lessened and, even the time required to gather information about current available men in a station is lowered.

3. DIFFERENT PERSONAS IN THE SYSTEM
3.1 Police Personal
A police personal is the persona which will comprise of the constables and the ranks below a sub-police inspector [2]. Their functions are primarily to send out an alert if any unwanted situation is encountered or send a request for men in a certain situation. The other function is to follow the order laid down by the senior official. The senior official will get a position update [10] once the police personal has reached the required place as ordered.

3.2 Police attendance in-charge
This group of personas comprises of only the Duty Officers (DO) [2]. Their primary and main function is to upload the attendance of the Police personas working in the station at a given time. The DO checks the number of men available in his station at the current day and feeds the data in his end of the application and posts that in the database. This data is then shown to the Senior Official at the time when, he has to assign men for a certain task or in response to a certain alert.

3.3 Police officer
These are primarily those personas who are allowed to give orders to the Police personals and duty officers. At times of alerts or requests for task force these officers are allowed to assign the men from the station(s). This group of personas comprises of the SPI, ASP, DSP and the top most CP [2].

3.4 Database admin
These are primarily database experts who will administer the database. They are the technical people who are associated with maintenance and services of the database. They are even responsible to assign valid credentials to every new police official.

4. MAIN SCENARIOS
4.1 Situation alert
This scenario is when a police official (Police personal, police attendance in charge or police officer) reports a certain situation with the location [3] and requirement of men to handle that certain situation. An alert can be raised by any of the police personals.

When an alert is raised, it will contain the location of the alert, the severity, the required personal to handle the situation, and the police personal's station ID. The station ID will be searched by the Java app and will thus forward the request for officials to the respective official or police officer in charge of station [2]. The police officer immediately gets the notification for the alert. Once the alert notification is received by the police officer, the personal who has raised the alert will get a notification that his request has been escalated.

4.2 Task force mobility
After the alert has been escalated to any of the police officer, they will initiate the movement of men using our proposed application. Upon receiving a request for task force, the police officer will forward the manpower availability request to all the stations under his jurisdiction. The Java app will collect the responses and display them on the android app. Now, the police officer will select the station with respect to the nearest ones from the alert site, from where the task force will be initiated. Once the movement is initiated the java app forwards the movement order to the respective station's in-charge. The in-charge then allocates the officials from his station. Once the officials have been assigned task, the java app fetches the current location and send it to the senior or police officer who had initiated the request. Once the official reaches the destination where the task force was require, the GPS location [3] will be sent to the officer stating that the official assigned has reached, this is followed for all the assigned police officials. Eventually when all the officials have reached the location specified the police officer's application will notify them that all the assigned officials have reached.

4.3 User login and attendance
This scenario is common to all the personas. The user login [11] is the scenario wherein as soon as the app is launched the user is presented with a login page. When the credentials are entered, they are checked with the credentials in the database, if the credentials come out as false then a failure message is displayed. If the credentials match then a successful login is shown and the user's home page is shown. The home page will have the user's rank, name, his police station ID & depending on the rank the UI will vary. The home page will have a common message box and an alert button, so as to ease the informing of alerts or request of men.

The other part i.e. attendance is a periodical scenario. This scenario will be run every day by the Duty officer so as to remind the official to register their availability for that period of time at his/ her station.

5. COMPARISON OF PROPOSED AND TRADITIONAL SYSTEM

In the traditional system [2] when a certain alert is raised, the personal had to either call [12] for backup or use radio chatter. But even when a call is forwarded, it takes at least 3 second to connect our call to the other person. Now, when our requirement is put through the Officer will have to call each and every official that he wants to send to respond to the alert, thus, this complete scenario will take up at least 15 to 20 minute just for the officials to be sent to the site of alert. In comparison to the traditional system, in the proposed system the whole scenario of raising an alert and assigning the officials to respond, will take not more than 5 minutes. This decreases the reaction time for a certain alert thus making the police force much more effective and efficient.

Now, in the traditional system [2] when a certain arrangement is to be done and it requires a certain amount of task force, then the traditional method is to call up each station and check their availability of officials. Because of this there may sometimes be some miscommunication and lead to a shortage or excess of officials in one place, thus, the man power is not being utilized efficiently. In the proposed system when the assignment of task force is to be done, the officers get to see the number of men in the stations at a glance, this reduces the workload and helps in easily assigning men to a certain task. Because of this, the number of officials assigned to a certain task aren't assigned in excess or less then the required amount. Thus, improving the efficiency and man power mobility of the police work force.

6. PROPOSED SYSTEM

In the overall workflow of the system, there are three personas, out of which the log-in scenario is common for all of them. In the Figure 2 we can see the complete workflow with the sequence of the functions of each personas,

After the log-in, the next function is the attendance update wherein the attendance of the officials is updated in the database. When an alert is raise or a request for workforce is placed, the request is logged for future reference and to ensure keep record. This alert or request is then forwarded to the police officer so that he can assign officials for the task. The officer's respond is by allocation of the police officials for the requested task. This response updates the database and send out a notification to the officials who have been summoned to a certain location. The database update will now ensure that the same officials aren't assigned to another assignment while they are already assigned to one.

7. CONCLUSION

In today's times with the increase in technology, and due to affordable handsets/mobile phones almost everyone has a smart phone. Issuing expensive electronic gadgets like a GPS locator, Walkie-Talkie & etc. to each and every police official on field can be a bit expensive. Instead of multiple different gadgets one smart phone assigned to one official should suffice. With this, our proposed system focuses on developing a system based on these smart phones that will not only decrease the cost for new gadgets but also increase the efficiency of the work-force.

Based on different assumptions, the proposed system can be modified to and brought to use in different sectors of the society, like Management of Doctors in times of epidemic, managing the soldiers depending on request of the Officer.

Based on the survey of the traditional police system and its comparison with the proposed system we can see the following conclusions: -

- The efficiency of the traditional police system is less as compared to the proposed system as it decreases the reaction time to an alert.

- The proposed system will make the police force's task force a lot more effective in managing their man power.

- The proposed system will help increase the communication amongst the officials in times of alerts and help to avoid miscommunications during unease situations.
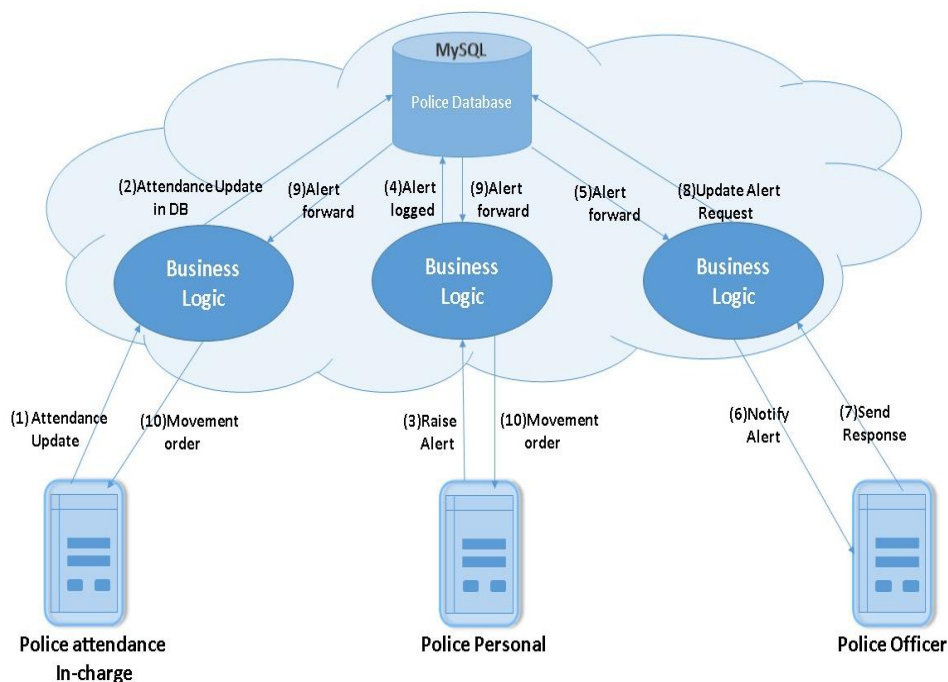

Fig 2: Workflow and sequence of operations

8. ACKNOWLEDGEMENTS

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