Kumbh Mela Missing People Location using Geo-Fencing

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Abstract: *Millions of people visit the kumbha mela every year and with the enormous crowds of attendees at the event it is quite easy for someone to get separated from their group of friends or family members. This paper will discuss using Geo-fencing and GPS tracking to assist in locating missing individuals as quickly as possible. Geo-fencing involves creating virtual barriers around specific locations and when an individual crosses these barrier lines, the system automatically sends out alerts to the organizers of the event as well as to a family member of the missing person. The intention of the Geo-fencing based system will be to provide a quicker and easier method to find the lost person, which will increase the overall level of safety during the kumbha mela event. Furthermore, this paper will discuss the positives and negatives of using Geo-fencing technology in addition to the privacy implications of its use.*

Keywords: Geo-fencing, Missing persons tracking, GPS tracking, Location-based services, Crowd management.

I. INTRODUCTION

The Kumbh Mela is one of the biggest religious festivals in the world. Millions of people travel across India to take part, which makes it easy for people to get lost or separated from their groups. This can cause stress and sometimes even dangerous situations. Keeping everyone safe in such a huge crowd is a major challenge for organizers.
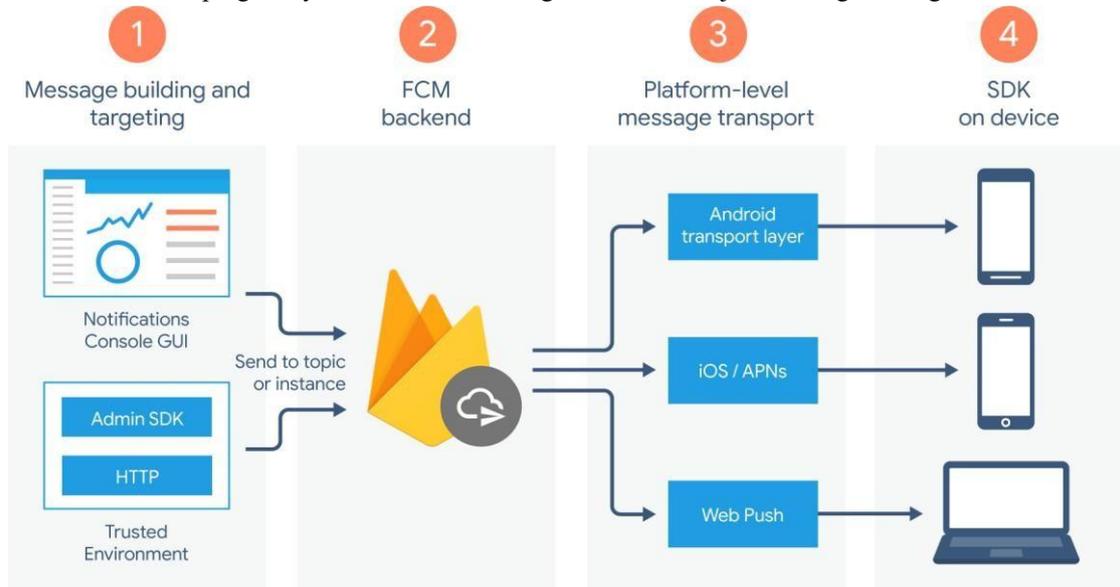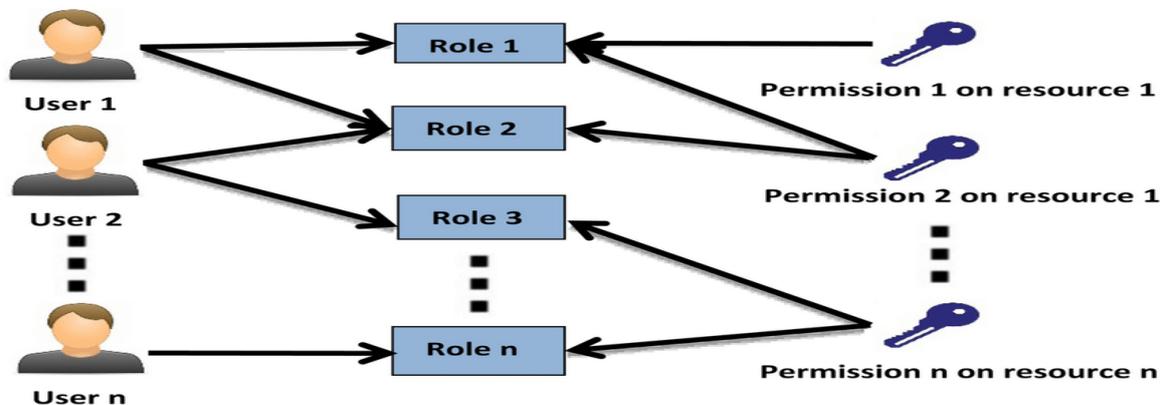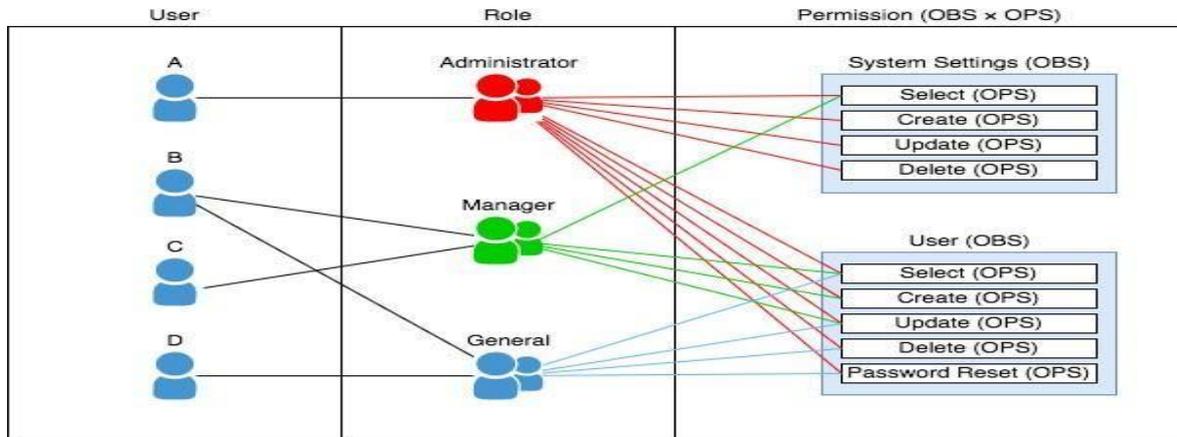
FIG 1. DFD1

One possible solution is to use geo-fencing and GPS tracking. Geo-fencing sets up invisible boundaries around certain areas, and if someone crosses them, an alert is sent to the authorities. With the help of mobile phones and smart devices, this system can track people in real time. This means missing persons can be found faster, and communication between organizers, police, and families can improve.

Although setting up geo-fencing for such a massive event is technically difficult, it could greatly improve safety. The idea could also be used at other large gatherings, like concerts or sports events, with proper planning and coordination.

II. RESEARCH METHODOLOGY

The purpose of this study is to design a system that can assist with locating missing persons at the Kumbh Mela using GPS tracking and geo-fencing. The following steps outline the way we will design, build and test the system to achieve this goal.

1. Design the System This system will use geo-fencing and GPS tracking to develop a system that allows for real time tracking of individuals that attend or volunteer at the Kumbh Mela in order to locate any participants that go missing in a timely manner. To do this we will establish virtual boundaries (geo-fences) around key locations at the Kumbh Mela, including entrances and other heavily populated areas, and use GPS devices (smartphones and/or wearables) to track participants in real time.

2. Create Geo-Fences We will create virtual geo-fences around selected locations at the event by identifying GPS coordinates for those locations. If a participant crosses a geo-fence (i.e., leaves a designated safe location), an alert will be sent to event coordinators and family members of that individual automatically. Geo-fences will be modified throughout the event based on crowd density in these areas.

3. Data Collection We will gather location-related information from the following sources:

• Mobile Applications: Attendees and volunteers will be able to share their real-time location by using an app.

• Internet of Things (IOT) Devices: Some participants will also be fitted with wearable GPS devices.

• Crowd Sensors: Crowd sensors used throughout the event will provide information about how the crowd is moving (i.e., crowd density) in real time. This information will allow for the updating of geo-fences based on the movement of the crowd.

FLOW CHART
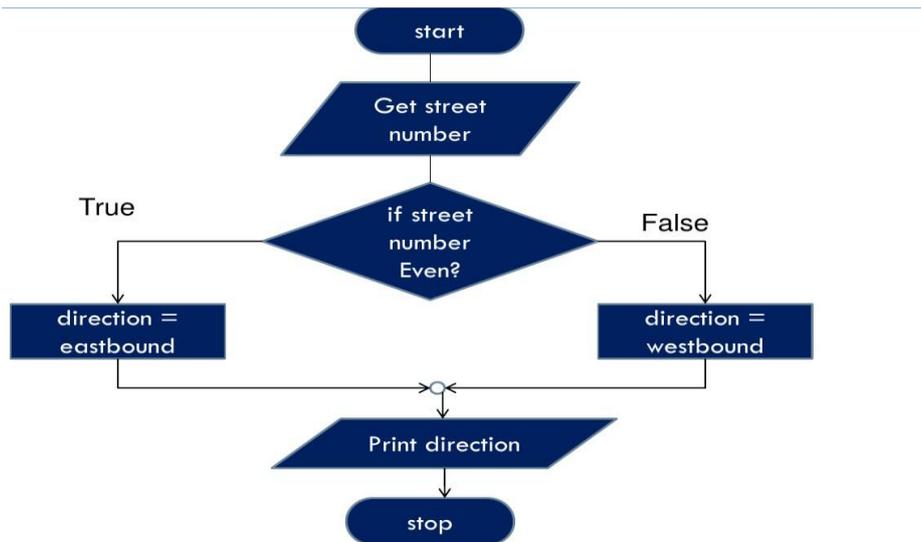
III. IMPLEMENTATION OF THE KUMBHSAARTHI APP

The purpose of the missing person location system at Kumbh Mela to help locate missing people fast in large crowds by using geo-fencing.

1. Geo-fences will be set up around selected locations, such as entrance areas, cultural/historic sites and high density areas, which will be established using GPS coordinates. If a person crosses a geo-fenced area, the system will recognize this activity and send an alert.

2. Participants attending Kumbh Mela will provide geo-location data through GPS-enabled apps or wearable devices. By obtaining geo-data for each participant in real-time, the system will be able to track participants in real time and send alerts when an individual is missing after crossing a geo-fenced area.

3. When a participant crosses a geo-fenced area, alerts will automatically be sent to event organizers and the missing person's family. The system will also indicate the last known location of the missing person on a centralized event control dashboard, to allow security personnel to locate the missing person more efficiently.

4. The event staff will monitor the missing person location system in real-time to locate any missing person, upon finding a missing person, staff will check the dashboard to determine where the individual was last located and where to search for the individual.

5. Prior to the start of the event, the missing person location system will be tested to confirm the geo-fences are set properly.

IV. FUTURE WORK

Adding Face Recognition functionality to enhance the app's capabilities and speed up the identification process when searching for missing people permanently, Enable Live Tracking of individuals via GPS coordinates, Use of AI to match

pictures/reports and identify missing persons, Provide an Analytics Dashboard for event organisers to identify pattern changes such as where the most frequent sites for lost persons would be , Translator capabilities to enable the use of the app in multiple languages., Provide an emergency SOS feature for instant help on location or for family members tracking you , An additional feature will be an offline mode, which will utilise downloaded information, but will retain all data until re- established connection.

BENEFITS

• System bandwidth & processing capacity for providing real time updates: As changes occur, users will always see the latest available information.

• Centralised database: All information for the KumbhMela will be stored centrally enabling easy access, management.

• Role based security within the application will ensure that users of the application are assigned to their respective roles and only have access to data they are able to view by their roles.

V. CONCLUSION

KumbhSaarthi is an efficient, expandable system to help assist with misplaced person reports throughout a big event. The program incorporates an Android application and Firebase database to ensure effective coordination between family members, volunteers, and administrative resources to reduce response times and increase the level of safety.

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