Aapda Sanketak (Asaan) App

Introduction

Aapda Sanketak or the Asaan mobile app is a revolutionary mobile application designed to address various disasters by harnessing the power of **crowdsourcing and open data**. This app empowers communities to report to a community-driven forum and there they can report their grievances varying from a **simple broken drainage to a flood**.

Reporting disasters has never been easier, instead of calling a helpline or reaching an online complaint/reporting portal, users can just click pictures and straightaway report any disaster or water-related problem swiftly.

With easy-to-use UI users will enjoy convenience when it comes to reporting a disaster without knowing or even mentioning the address of the place of mishap. With **geo-referenced multimedia** eliminates much of the error faced in describing the precise location of the disaster stuck area.

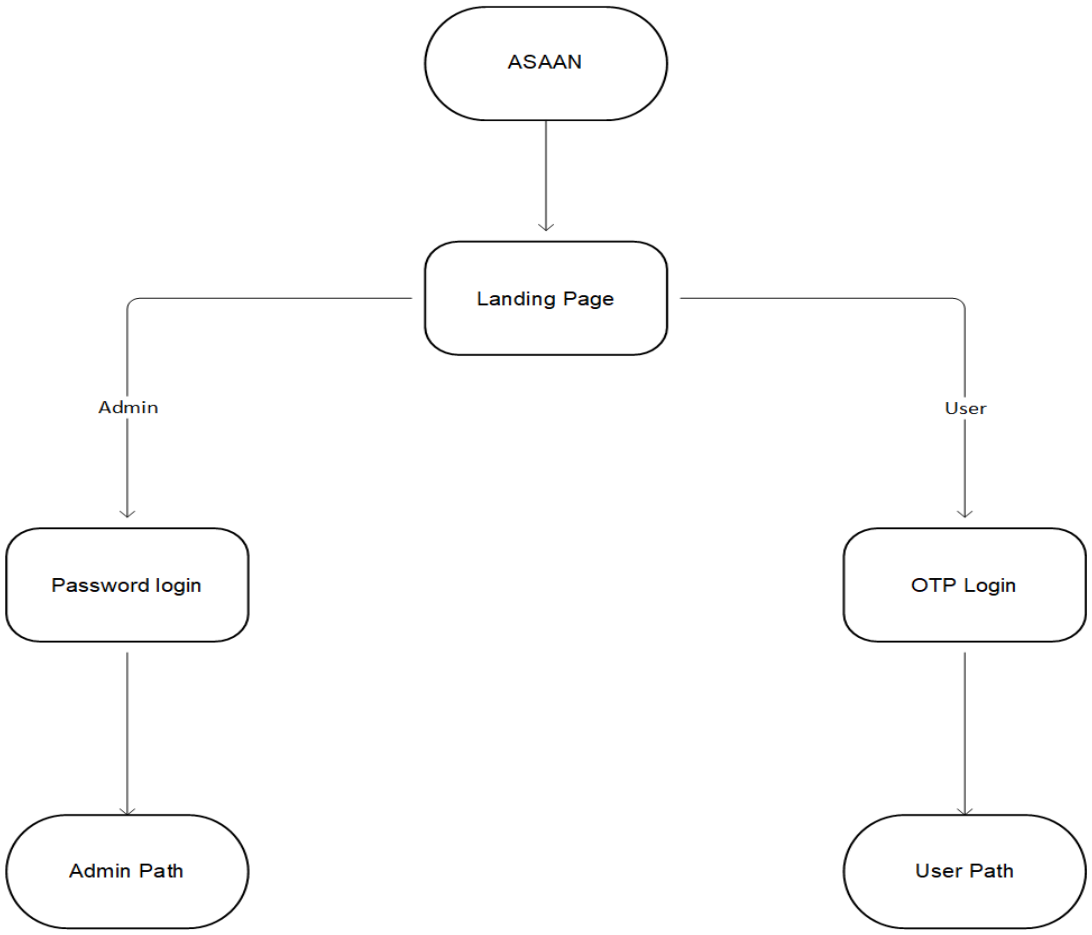
Leveraging clever machine learning algorithms, this mobile app will be able to eliminate a lot of paperwork and human intervention hindering the communication between the reporter and the responder.

Working

1. Authentication

The app will feature a landing page which then will be branched to **two different modes** of authentication depending on the role of the user.

- User – OTP (One time password) authentication
- Administrator – Password Login



2. Administrator

The administrator is going to be responsible for the management of everything in their locality. The layout of the map display is going to follow along the same lines as the wireframe given below.

- The admin has the option to overturn the classification by the model and report the false positive.
- The admin also has to power to **delete posts, and even ban repeat offenders** of falsification or any other guideline violation
- To get a bird's eye view of the area, the **dashboard be will list all the disasters in the locality** with their description.
- Similar/Same reports of a disaster are going to be clubbed together so as to reduce redundancy

- Further explaining the previous point above, multiple users may upload different versions or angles of the same disaster, to address this redundancy we are going to club similar and nearby disaster reporting using the popular **K means clustering** algorithm.

3. User

The layout of the user side will follow a similar layout to platforms like reddit, stack overflow and other social media platforms. Below are some of the features for users.

- Disaster Reporting:
    - Users submit their disaster reports, which include the geo-referenced, image, and description.
    - The app stores the report in a database for review and action.
- Upvoting and Downvoting:
    - Users can browse through the reports submitted by others.
    - They have the option to upvote or downvote reports based on their severity or relevance.
    - Voting helps prioritize reports and gives a sense of urgency to authorities.
- Reporting Users:
    - Users can flag reports that they believe are false, misleading, or spam.
    - Flagged reports are reviewed by moderators or automated systems to maintain data integrity.
- Reaching Authorities:
    - When a report is submitted, the app automatically notifies the concerned local authorities.
    - Users can track the status of their reports and any actions taken by authorities.
- Receiving Warnings and Alerts:
    - Users receive real-time warnings and alerts from authorities about potential disasters in their area.
    - These warnings can include instructions on evacuation, preparedness, or safety measures.

4. Database

The app uses a Key-Value **NoSQL database** on Firebase called **Firestore** as opposed to the conventional Rows and Column SQL database, since a key to value structure is very appropriate for social media like platforms where users post, reply, comment, upvote and downvote to various posts.

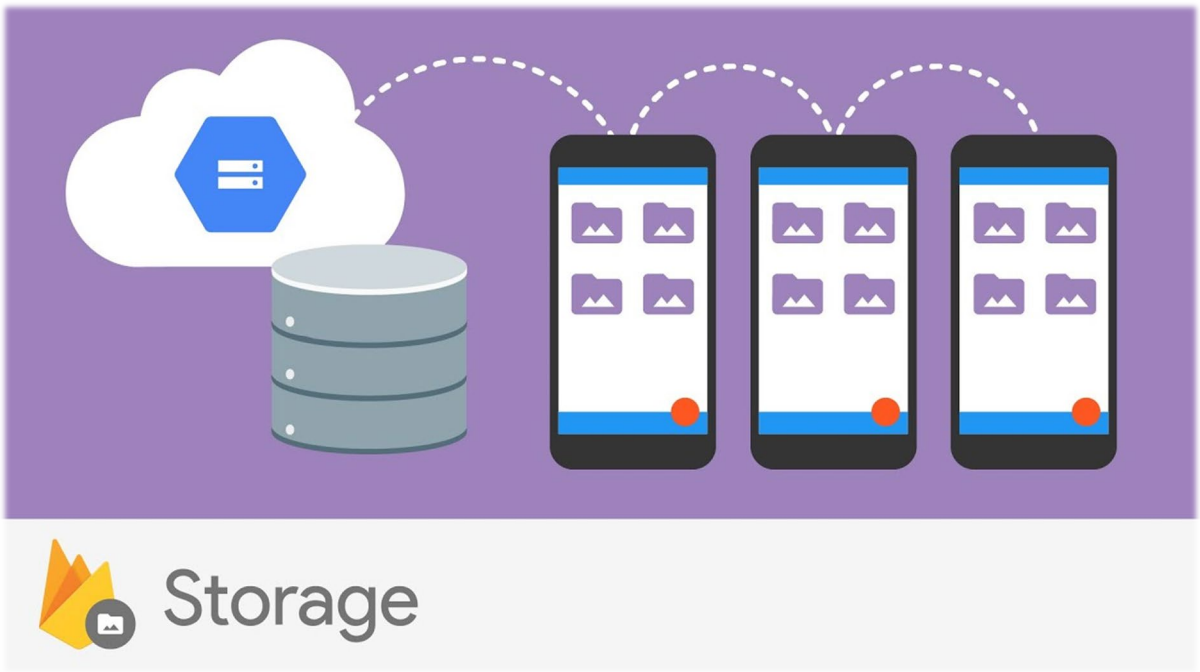
Here is a representation of the schema:


```
{
  "id": "unique_post_id",
  "latitude": 37.7749,
  "longitude": -122.4194,
  "imagePath": "path_to_image.jpg",
  "commentThreadId": "comment_thread_id",
  "nature": "post",
  "timestamp": "2023-10-26T10:00:00Z",
  "username": "example_user",
  "message": "This is the post message.",
  "upvote_count": 10,
  "downvote_count": 2
}
```

5. Blob Storage

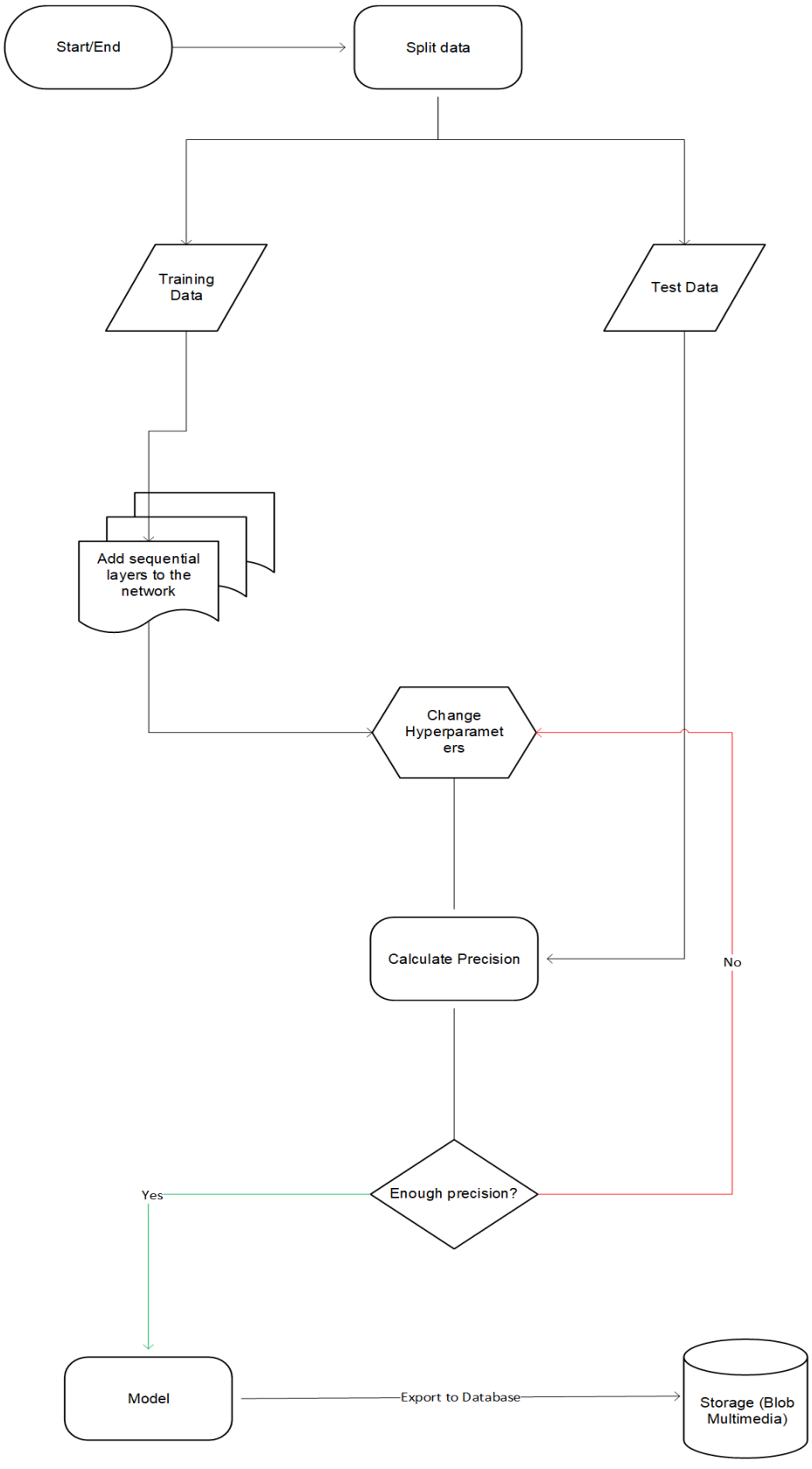
The blob storage will be responsible for the storage of the following items:

- **Multimedia –** All the multimedia uploaded by the users will be stored here.
- **Model –** The trained model is then stored on the firebase storage and then fetched locally on the phone. The model is already trained therefore it on behaves like a function where it takes input in form of an image and outputs an array of the form:
  [disaster type, severity, concerned authority]



6. Model

The Disaster classifier model will have the following workflow



7. Conclusion

- Asaan App

  It is a user-centric approach ensures that the app serves as a comprehensive platform for disaster reporting, communication with authorities, and community engagement, ultimately contributing to improved disaster management and user safety.

- Potential solutions to Potential Show Stoppers

  Awarding digital badges on certain milestones could be a huge morale booster to the users to keep them on the app, also when users share these badges to within their friend circle, they are also motivated join in on the app.

  As far as network dependencies are concerned, we can send in post as a SMS without network as the trained model is stored on the device itself which doesn't need internet or network to run, the SMS is converted to a post through a hosted script and pushed to the app for the authorities and people to see. In case of no network and internet the post will just cached until a sending medium is available.

- Why Asaan app?

  While we are aware of the other alternatives like disaster helplines, online grievance portals and social media websites like twitter, our app aims to report disasters related problems faced by locals which often go unheard by the authorities or just take too much time to address. With geo referenced multimedia attached to posts so that the authorities have the exact coordinates and a general idea of what kind of equipment and the amount of personnel they need to take with them so that the situation is handled swiftly.

- Our Impact

  Assist organizations to effectively manage water related disasters, bridge the gap between public and authority. And potentially remove the extra layer of bureaucracy and first responder delays which increases the time taken to address the disaster at hand.