**Hailstorm Prediction Mechanism**

**Objective:**

The main objective of this manual predictive system is to identify the possibility of Hail to occur in a particular location based on analyzing the historical data of hails collected from previous years.

**Purpose:**

Business analyst, Field Technician or operational manager can plan to move and place the Rig in an efficient manner to overcome the possible impacts due to Hail.

**High Level Solution:**

Historical data of hails for the past 5 years has been collected in raw files.

Then, cleansed data has been uploaded in cosmos Db.

Reports of different types : Month wise, state wise and location wise has been generated.

Generated Reports are plugged into a Single Page web application.

End user can use this UI to see reports then analyze and plan his business needs.

Diagram

Description automatically generated

Technologies used: cosmos, Power BI and angular with .net 5.0.

**Low Level Solution:**

Extract, Transform and Load: Historical data for a period around 5 years has been collected in csv format. Then, processed those data by removing additional fields, formatting data in required format and consolidate all data finally loaded in cosmos DB.

Reports:

Using the historical data, certain queries has been written to fetch data from cosmos DB and used in report generation. Reports has been generated using Power BI tool. Reports represented in the form of Bar graph with magnitude in y-axis and state, month, location in x-axis respectively. Hail threshold has been set to 1.5 and is differentiated in various colors.

UI:

An angular webpage has been designed for end users. Generated power BI reports have been integrated in a page. End users are provided the flexibility to view reports in any one of the below forms.

1. State wise
2. Month wise
3. Location wise

Each report is having different filters to choose from and to year, month, state and location respectively.

End User can select any report for analysis and based on chart data, user can predict and plan RIG movement accordingly.

**Problems solved:**

**Scope for Improvement:**

1. Collect population information for a state or location, based on that RIG movement can be done further. Though magnitude is high and with lesser crowd, opportunity to solve business problem for many people is less. If population information is also in-hand, then possibility to benefit more people is slightly higher.
2. Collect Vendor information who supplies RIG, so that RIG’s can be hired in-advance to manage the hail.
3. Collect information about technicians who handles RIG, so that manpower / staffing can be handled better.
4. Prediction algorithms can be designed to intimate the end Users automatically about Hails.