Karnataka State Police
Government of Karnataka

DATATHON 2024

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Team Name: Radiant Ranger
Theme: Police Performance and Resource Management

Title:

Harnessing AI and Social Media for Early Crime Detection and Efficient Personnel Management.

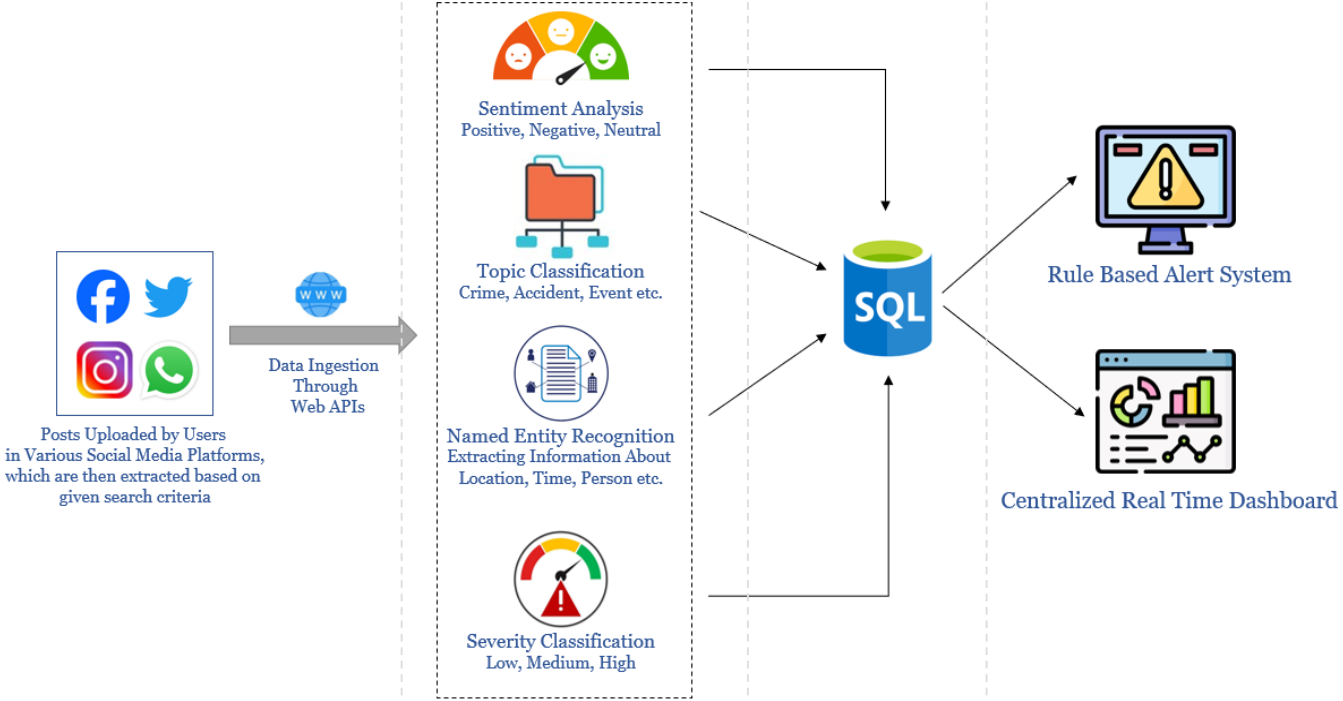
Problem Statement	Solution Brief
• Law enforcement agencies need to **gather information effectively** to **respond to incidents** and **allocate their resources.** • However, the existing methods of **information gathering** have several drawbacks. • They depend on **direct reports from people** who witness or experience the events, or **from police personnel** who communicate through internal channels. • These methods are **slow and inefficient**, as they **do not cover all the possible sources of information** and **analyzed manually**. • As a result, law enforcement agencies face **challenges in planning their actions effectively**.	• To solve this problem, we propose to **utilize social media as a source of information for law enforcement**. • Social media platforms generate a lot of data that can be relevant for detecting and responding to incidents, such as posts, comments, images, videos, hashtags, locations, etc. • However, these **data being unstructured**, makes it **hard to analyze and use**. Therefore, we will **apply AI enrichment techniques** to **automatically process and transform the unstructured data into structured and meaningful data points**. • These data points will help us **create KPIs and Metrics along with an alert system** that will enable law enforcement agencies with **efficient resource planning and management**.

Solution Overview

- Collect posts and comments from various social media platforms regarding relevant events, through their respective web APIs
- Analyze sentiments of the collected data as Positive, Negative and Neutral.
- Classify the data as related to any particular relevant topic, like Crime, Accidents, Riots, etc.
- Extract the named entities mentioned in the data to collect information about Location, Person, Time, etc.
- Classify the severity level of the mentioned events as Low, Medium or High
- Store the collected unstructured data in a data lake and transformed structured data in a centralized sql database
- Develop KPIs and Metrics to be displayed in a real time dashboard which is updated continuously.
- Set up rules to monitor the incoming data points and trigger alerts to concerned officials immediately.
- Use the dashboard to see the real time incidents and corelate with the personnel data, to plan and deploy resources in the affected area.
- Use the historical data points in the database to train custom models of your own for predictive analytics.

Architecture Design (High Level)

Assumption:
Police Personnel Details and Deployment Information is already recorded in a separate database

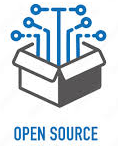


Value Proposition

- ✓ The solution enables law enforcement agencies to **gather and analyze large amounts of data automatically**.
- ✓ The solution uses **machine learning and real time data analysis** to identify the locations, types, and severity of disturbances. It also **correlates this data with the data of deployed and available personnel**. This helps law enforcement agencies **plan how to deploy their personnel effectively** and control the situation as soon as possible.
- ✓ This solution also helps law enforcement agencies **control and mitigate fake news** on social media by **automatically identifying the trending topics**.
- ✓ Moreover, the **data collected** by the system will enable the agencies to **train their own custom models** for predictive analytics purposes.
- ✓ By using this solution, law enforcement agencies can act proactively even before complaints reach them, and thus build trust with the public.

Our Edge / Uniqueness

Relevant information are gathered through **crowdsourcing**, and **automated processes extract meaningful insights** from unstructured source data



The solution is designed using **open-source** technology, which means it can be **easily developed and modified** as per future requirements, and can be deployed **both in cloud or on-prem server** as well.

The solution architecture is **modular and service-oriented**, each module can be modified and upgraded without disturbing the rest of the processes.

This solution grants users **full control and ownership of their data**, enabling its use for both diagnostic and predictive analytics in the future.

Tech Stack

- Programming Language: Python
- AI Based Text Processing: Transformer Models (BERT, GPT-3 etc.)
- RDBMS: SQL Server Management Service
- User Interface: HTML, CSS, Bootstrap, JavaScript
- Dashboard: Power BI

* The above tech stack mentioned is for developing the prototype only. Final solution may require additional or different resources as per the exact requirement.

Thank You

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