Problem Statement : Crime Investigation System

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Develop a cyber crime mapping system that will co-relate repetitive crime incidents, and criminal patterns & and track repeat offenders, by integrating data from various sources and utilizing data analytics to track various crime incidents. It will provide useful insights into crime mapping that can help in implementing preventive measures accordingly. It can also ensure efficient monitoring of repeat offenders.

Solution:

1. User Authentication:

- Secure login system for authorized law enforcement personnel.

2. Case Management:

- Create, manage, and track individual crime cases with detailed information.
- Assign cases to investigators and track progress.
- Access and update case information throughout the investigation process.

3. Data Integration:

- Integrate data from various sources, including police reports, crime databases, social media, and surveillance footage.
- Normalize and harmonize data from diverse sources for consistent analysis.

4. Crime Mapping and Visualization:

- Visualize crime incidents on interactive maps, pinpointing locations and timestamps.
- Identify crime hotspots and patterns based on location, time, and type of crime.
- Create heatmaps and trend charts to illustrate crime patterns over time.

5. Predictive Modeling:

- Utilize machine learning algorithms to forecast future crime incidents based on historical data and identified patterns.
- Alert investigators to potential crime hotspots and high-risk areas.
- Generate predictive insights to guide proactive policing strategies

6. Repeat Offender Monitoring:

- Create profiles of repeat offenders, including their criminal history, modus operandi, and personal information.
- Track the movements and activities of repeat offenders using GPS data, social media monitoring, and other available sources.
- Assess the risk of reoffending and inform targeted interventions.

7. Evidence Management:

- Securely store and manage digital evidence, including photos, videos, and documents.
- Tag and organize evidence for easy retrieval and analysis.
- Integrate with evidence management systems for seamless case management.

8. Investigation Tools:

- Provide investigators with tools for data analysis, pattern recognition, and hypothesis testing.
- Facilitate collaboration among investigators, analysts, and other stakeholders.
- Support the creation of comprehensive investigation reports.

9. Mobile App Integration:

- Develop a mobile app version of the crime investigation system for on-the-go access.
- Enable investigators to access and update case information, view crime maps, and receive alerts from anywhere.
- Facilitate real-time collaboration and information sharing among investigators.

10. Data Security and Privacy:

- Implement robust security measures to protect sensitive data, including encryption, access controls, and intrusion detection systems.
- Comply with data privacy regulations and ensure responsible data handling practices.
- Maintain transparency regarding data collection, usage, and sharing policies.

Software and Technology:

1.Front-end (Mobile App):

- Flutter for cross-platform mobile development
- Dart for programming logic
- Figma for UI/UX design and prototyping

2.Back-end (Server-side):

- Node.js for the server-side framework
- Express.js for creating RESTful APIs
- Azure App Service or Azure Kubernetes Service for hosting the back-end application
- Azure Cosmos DB or Azure SQL Database for storing and managing crime data

3.Machine Learning:

- K-Nearest Neighbors (KNN)
- Support Vector Machines (SVMs).
- Random Forests (RFs)
- Gradient Boosting Machines (GBMs)
- Long Short-Term Memory (LSTM)
- Hidden Markov Models (HMMs)
- Social Network Analysis (SNA)

4. Cloud Infrastructure:

- Azure for cloud hosting
- Azure Blob Storage for storing large files like images and videos
- Azure Active Directory for user authentication and authorization

5. Additional Tools:

- Android Studio or IntelliJ IDEA for Flutter development
- Visual Studio Code for Node.js development
- Postman for testing RESTful APIs
- Git for version control

Team Members & Responsibilities:

- **Sahil Panwar -** UI/UX Designer, Cloud Security
- **Dhruv Sharma -** Front end, Backend
- **Ankit Singh -** ML Integration and Data Collection
- **Shine Gupta -** Ml Integration and Data Analytics

Flow Chart / Graphical Representation:

1. Start
- User enters provided credentials.

2. Menu Options
The user chooses from three options:
- A. Enter a new case
- B. Search the criminal
- C. Investigate a case

3. Investigation Option (C)
- If the user selects option C for investigation:
- Proceed to the next step.

4. Questionnaire
- The model prompts the user with certain questions related to the investigation.
- These questions aim to gather information and details about the case.

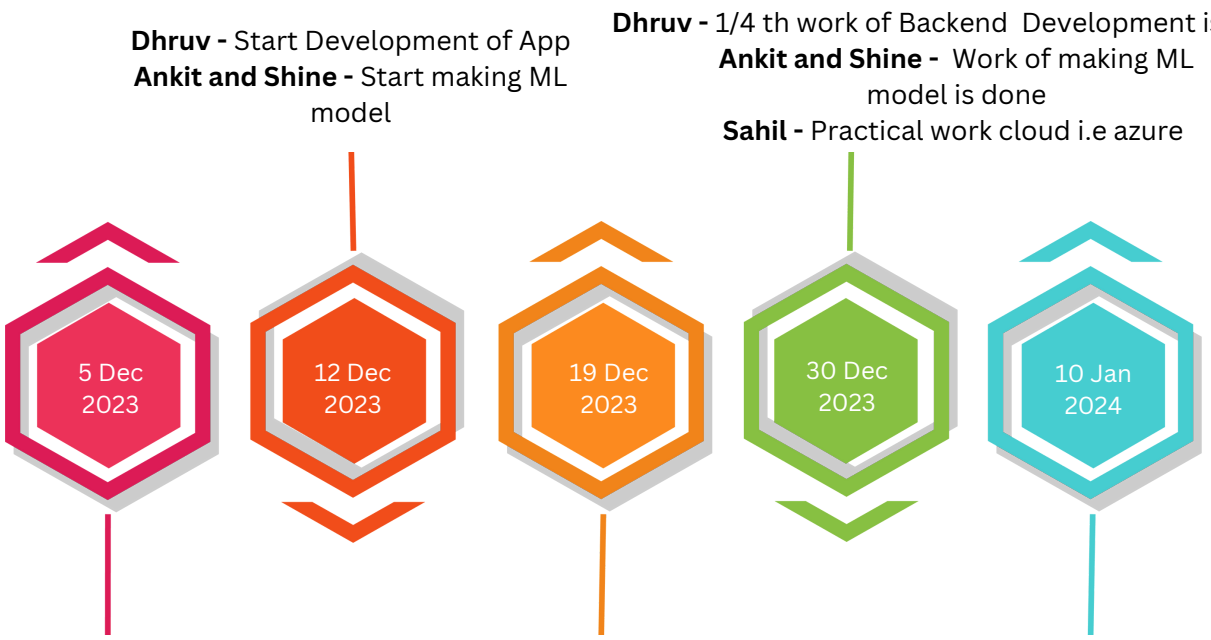
5. Internal Mapping
- The model internally maps the provided information with procedural steps from previous cases.

6. Prediction
- The model predicts the desired output based on the internal mapping and similarities identified.

7. Option for Case Report (Future)
- If desired, there is an option for the user to prepare a report for the entire new case.
- This feature anticipates future functionality for comprehensive case documentation.

8. End
- The process concludes.

Schedule:



Sahil- Start preparing UI
Ankit - Start Collecting Data

Dhruv - Start Development of App
Ankit and Shine - Start making ML model

Dhruv - Continue Development
Ankit and Shine - half work making ML model is done
Sahil - Study for cloud i.e Azure

Dhruv - 1/4 th work of Backend Development is done
Ankit and Shine - Work of making ML model is done
Sahil - Practical work cloud i.e azure

Dhruv - The app is done
Ankit and Shine - making ML model is done
Sahil - Half work on cloud i.e azure

After 10 Jan 2024

Sahil ventures into the domain of cloud security, Dhruv assiduously taps into our college mentor's expertise, and Ankit and Shine systematically enhance their model's effectiveness.