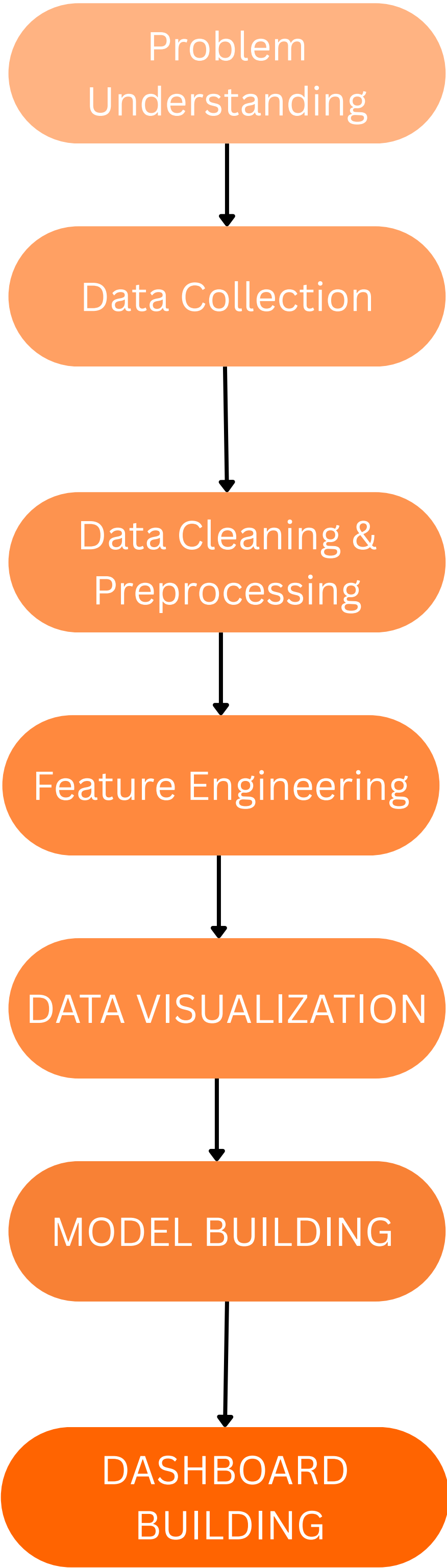


ROAD MAP FOR POS-5



Rapid urbanization in India causes severe traffic congestion and rising road accidents (1.5L+ deaths/year). Traditional reactive systems identify risks only post-incident. Authorities lack predictive tools for proactive safety measures.

Extracts accident data from data.gov.in using requests+BeautifulSoup for HTML tables.Downloads MoRTH PDF reports via Tabula-py for structured extraction. Pulls IMD weather data and OpenStreetMap road networks programmatically. Handles anti-bot measures with headers, delays, and session management.

Identifies missing values using df.isnull().sum() and imputes with median/forward-fill.Removes duplicates via df.drop_duplicates() and outlier detection with IQR method.Standardizes datetime formats using pd.to_datetime() for temporal analysis.Normalizes location names through fuzzy string matching for district mapping.

- 1 Time-Based FeaturesExtracts hour (0-23), day_of_week, month from datetime columns using .dt accessor.
- 2 Environmental & Risk FeaturesCreates rain_flag from weather strings using regex pattern matching.
- 3 Target Variables Creationaccident_occurred: Binary target (1 if accident, 0 if safe segment).

- 3.1 Accident Hotspot Map
- 3.2 Temporal Patterns Analysis
- 3.3 Weather Correlation Matrix
- 3.4 Traffic Density Impact
- 3.5 Feature Correlation Heatmap

- 4.1 Model 1: Accident Risk Prediction
- 4.2 Model 2: Traffic Congestion Prediction
- 4.3 Model Validation Framework

- 5.1 Interactive Dashboard Architecture
- 5.2 Key Interactive Components
- 5.3 Decision Support Engine