Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	28 June 2025
Team ID	LTVIP2025TMID40374
Project Name	TrafficTelligence: Advanced Traffic Volume Estimation with Machine Learning
Maximum Marks	4 Marks

Technical Architecture:

The system architecture for TrafficTelligence is designed for real-time traffic monitoring using data from IoT sensors and surveillance feeds. It integrates a machine learning model deployed in the cloud to analyze and predict traffic volume. Users and traffic authorities can interact via a dashboard or mobile interface.

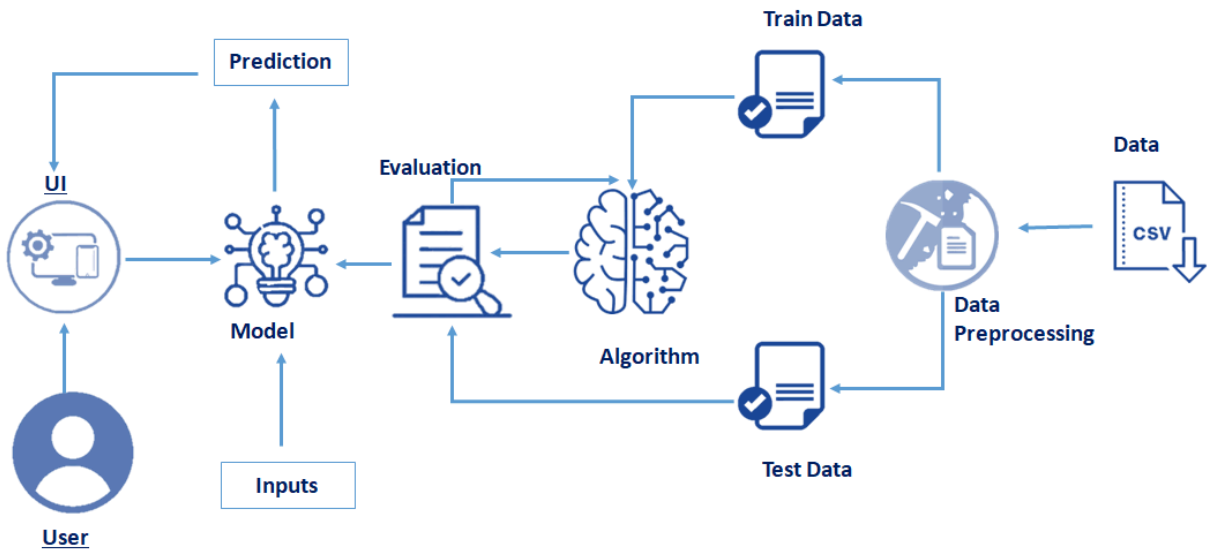

Table 1: Components & Technologies :

S.No	**Component**	**Technology Used**

1	User Interface	ReactJS Web App / Android App using Kotlin/Flutter
2	Application Logic-1	Traffic data preprocessing using Python
3	Application Logic-2	ML model inference logic using Flask API
4	Application Logic-3	Traffic alert generation & route recommendation
5	Database	MongoDB (local test)
6	Cloud Database	MongoDB Atlas / Firebase Firestore
7	File Storage	AWS S3 / Google Cloud Storage (video/image)
8	External API-1	Google Maps API for live routing
9	External API-2	Government Traffic Feed API
10	Machine Learning	Model XGBoost or CNN model (deployed using Flask/FastAPI)
11	Infrastructure (Server/Cloud)	IBM Cloud / AWS EC2 / Google Cloud Run

Table 2: Application Characteristics

S.No	Characteristics	Applied In TrafficTelligence
1	Source Frameworks	Python, Flask, React, MongoDB
2	Security Implementations	Token Authentication (JWT), API Gateway
3	Scalable Architecture	Microservices + Cloud Deployment

4	Availability	24x7 Cloud Hosting with Auto Scaling
5	Performance	Optimized ML inference, Lightweight Frontend

References:

https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/

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