

Project Design Phase-II Technology Stack (Architecture & Stack)

Date	03 October 2022
Team ID	Team-593144
Project Name	TrafficTelligence: Advanced Traffic Volume Estimation With Machine Learning
Maximum Marks	4 Marks

Technical Architecture:

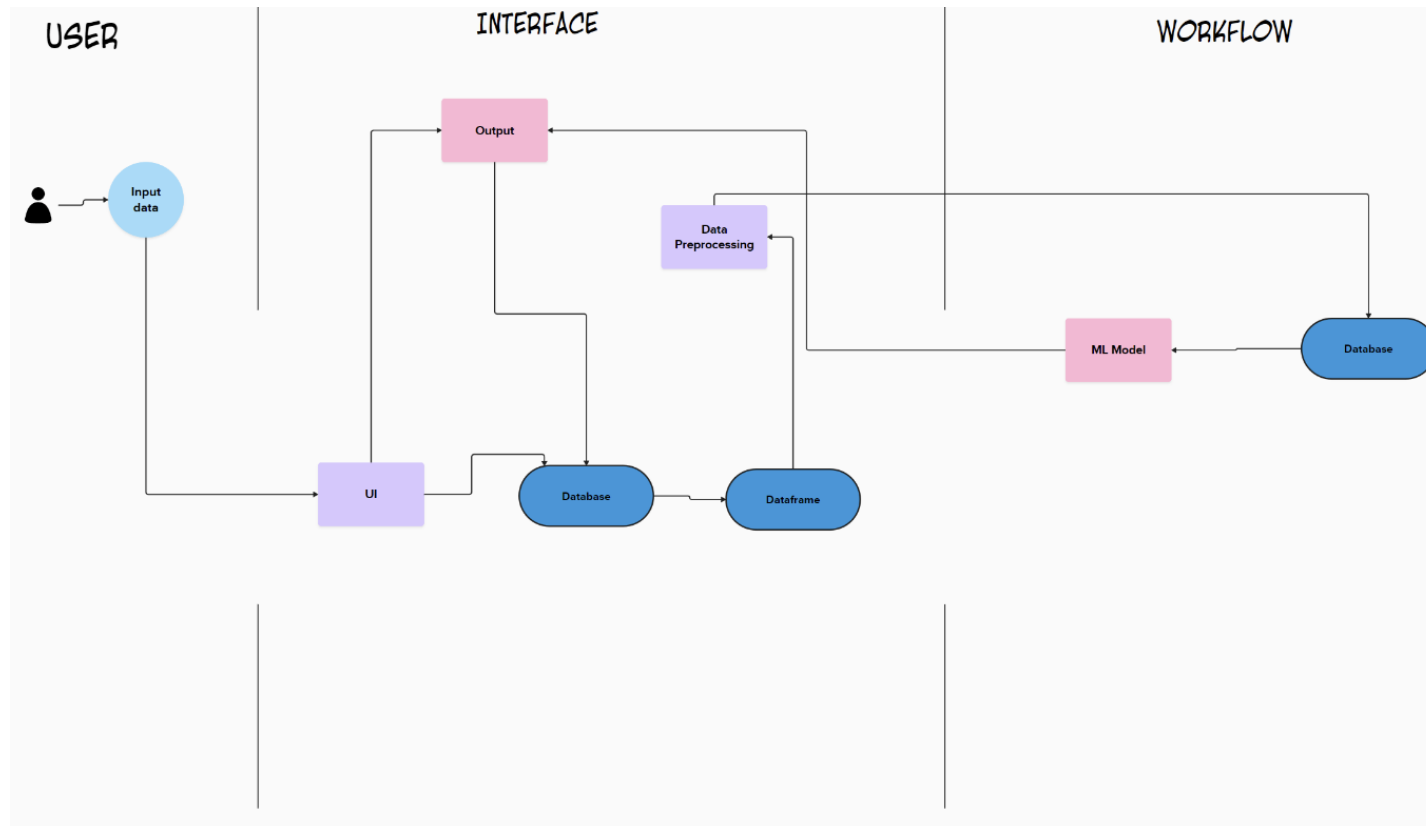


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	Data Collection Systems	Collects traffic data through sensors, cameras, and other devices at various locations.	IoT, Cameras, Sensors
2.	Data Preprocessing	Cleans and preprocesses the collected data, handling missing values and noise.	Python (Pandas, NumPy)
3.	Machine Learning Models	Develops and trains models to estimate traffic volume and identify traffic rule violations.	Python (Scikit-Learn, TensorFlow, PyTorch)
4.	Real-Time Data Streaming	Streams real-time traffic data to the ML models for continuous analysis.	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	Apache Kafka, MQTT.
6.	Traffic Volume Estimation	Utilizes ML algorithms to estimate traffic volume and congestion levels.	Regression Models, Neural Networks
7.	Early Alert System	Provides early alerts to authorities and commuters in case of severe traffic issues.	Mobile App, Push Notifications
8.	Data Storage	Stores historical traffic data for analysis and reporting	Relational Databases, NoSQL Databases

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Real-Time Monitoring	Provides real-time traffic updates and monitoring for commuters and authorities.	Web Dashboard, Mobile App
2.	Predictive Analysis	Predicts future traffic conditions and suggests preventive measures.	Machine Learning, Predictive Analytics
3.	Data Accuracy	Ensures data accuracy and reliability for informed decision-making.	Data Validation, Quality Control
4.	Scalability	Scales to accommodate increasing traffic data and new monitoring points.	Cloud Computing, Load Balancing
5.	User-Friendly Interface	Offers an easy-to-use interface for both traffic operators and the public.	UI/UX Design, Human-Computer Interaction
6.	Alert System	Notifies users of severe traffic conditions and rule violations.	Push Notifications, Email, SMS
7.	Privacy and Security	Ensures data privacy and security for all users and stakeholders.	Encryption, Access Control

