

Project Design Phase-II

Data Flow Diagram & User Stories

Date	31 January 2025
Team ID	LTVIP2025TMID38998
Project Name	TrafficTelligence: Advanced Traffic Volume Estimation with Machine Learning
Maximum Marks	4 Marks

Data Flow Diagram (DFD) Description:

Since I can't generate a visual diagram, I'll describe a Level 0 (Context Diagram) and Level 1 DFD for the TRAFIICTELLIGENCE Project.

Level 0 DFD (Context Diagram):

This diagram would show the entire TRAFIICTELLIGENCE System as a single process, interacting with external entities.

- **External Entities:**
 - **User:** Interacts with the system for monitoring, predictions, and reports.
 - **Traffic Sensors/Feeds:** Provides raw traffic data.
 - **External Weather Services:** Provides weather data.
 - **Traffic Authorities:** Receives recommendations and reports.
 - **Email/SMS Service:** Receives notifications for users.
- **Data Flows:**
 - **From User to System:** User Credentials, Query Parameters, Configuration Settings.
 - **From System to User:** Traffic Data (Real-time, Predicted), Alerts, Reports, Confirmation/Notification.
 - **From Traffic Sensors/Feeds to System:** Raw Traffic Data.
 - **From External Weather Services to System:** Weather Data.

- **From System to Traffic Authorities:** Traffic Recommendations, Analytical Reports.
- **From System to Email/SMS Service:** Notification Content.

Level 1 DFD (Decomposition of TRAFIICTELLIGENCE System):

This diagram would break down the main system process into its core sub-processes and show the data stores involved.

- **Processes:**

1. **User Management:** Handles user registration, login, profile management.
 - **Data Flows:** User Credentials, Profile Data.
 - **Interacts with:** User, User Database.
2. **Data Ingestion & Pre-processing:** Collects, cleans, and validates raw data.
 - **Data Flows:** Raw Traffic Data, Weather Data.
 - **Interacts with:** Traffic Sensors/Feeds, External Weather Services, Raw Data Storage, Processed Data Store.
3. **Real-time Analysis:** Processes current data to display live traffic conditions and incidents.
 - **Data Flows:** Processed Traffic Data, Incident Data.
 - **Interacts with:** Processed Data Store, Real-time Traffic Data Store, User, Alerts & Notifications Service.
4. **Predictive Analytics:** Runs ML models to forecast traffic and suggest optimal routes.
 - **Data Flows:** Historical Traffic Data, Real-time Traffic Data, Processed Traffic Data.
 - **Interacts with:** Historical Data Store, Processed Data Store, ML Model Store, User, Traffic Control Recommendations.
5. **Traffic Control Recommendations:** Generates actionable insights for traffic authorities.
 - **Data Flows:** Predicted Traffic Data, Analysis Results.
 - **Interacts with:** Traffic Authorities, Recommendation Log Store.
6. **Reporting & Visualization:** Generates dashboards and reports.
 - **Data Flows:** Real-time Traffic Data, Historical Traffic Data, Analytical Results.
 - **Interacts with:** User, Historical Data Store, Processed Data Store.
7. **Alerts & Notifications:** Manages and dispatches alerts to users.
 - **Data Flows:** Alert Triggers, User Preferences.
 - **Interacts with:** User, Email/SMS Service, User Database.

- **Data Stores:**

- **User Database:** Stores user profiles, credentials, preferences.
- **Raw Data Storage:** Stores unprocessed sensor and feed data.

- **Processed Data Store:** Stores cleaned and standardized traffic data.
- **Real-time Traffic Data Store:** Stores current traffic conditions for quick retrieval.
- **Historical Data Store:** Stores long-term historical traffic data for analysis and ML training.
- **ML Model Store:** Stores trained machine learning models.
- **Recommendation Log Store:** Stores generated traffic control recommendations.

User Stories

Using the provided template and extending for the TRAFIICTELLIGENCE Project.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive a confirmation email once I have registered	I can receive a confirmation email & click confirm	High	Sprint-1

			d for the applicati on.			
		USN-3	As a user, I can register for the applicati on through Facebook .	I can register & access the dashboar d with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the applicati on through Gmail.	I can register & access the dashboar d with Gmail Login	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the applicati on by entering email & password .	I can successf ully log in and access my personali zed dashboar d.	High	Sprint-1
	Dashboar d	USN-6	As a user, I can view real-time traffic condition s on a map for my	The map loads quickly showing live traffic flow (e.g., green/yell	High	Sprint-1

			current location.	ow/red for speed) and any incidents.		
		USN-7	As a user, I can search for traffic conditions in a specific area or route.	I can input a location/route, and the map updates to show traffic details for that area.	High	Sprint-1
		USN-8	As a user, I can receive real-time alerts about traffic incidents or congestion on my subscribed routes.	I get push notifications/SMS/email alerts for relevant incidents; alerts are timely and accurate.	High	Sprint-2
		USN-9	As a user, I can view predicted traffic conditions for a future time.	I can select a future date/time and see the expected traffic flow on the map.	Medium	Sprint-2

		USN-10	As a user, I can find the optimal route to a destination based on current and predicted traffic.	The system suggests the fastest/least congested route, displaying estimated travel time.	High	Sprint-2
	Reporting & Analytics	USN-11	As a user, I can view my historical travel patterns and efficiency reports.	I can access a dashboard showing my past journey details, average speeds, and time saved.	Low	Sprint-3

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web user)	Dashboard	USN-12	As a web user, I can access detailed traffic analytics dashboards.	The web dashboard displays comprehensive charts and graphs	High	Sprint-1

				for traffic metrics (e.g., historical congestion trends).		
		USN-13	As a web user, I can customize the types of data displayed on my dashboard.	I can select which traffic metrics (e.g., speed, volume, incidents) are visible and their display format.	Medium	Sprint-2
	Reporting & Analytics	USN-14	As a web user, I can generate and export detailed traffic reports for specific areas or time periods.	I can specify parameters for a report and download it in formats like PDF or CSV.	High	Sprint-2
	Traffic Control Recommendation	USN-15	As a web user, I can view system-g	The dashboard shows proposed	High	Sprint-3

	s		enerated recommendations for traffic light optimization.	changes to traffic light timings with predicted impact.		
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User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Administrator	User & Role Management	USN-16	As an administrator, I can create, modify, and delete user accounts.	I can manage user profiles, including their registration details and status.	High	Sprint-1
		USN-17	As an administrator, I can assign and modify roles and permissions for different users.	I can grant or revoke access to specific features (e.g., view reports, manage sensors) for each user.	High	Sprint-1
	Data Management	USN-18	As an administrator, I can	I can see a dashboard	High	Sprint-2

			monitor the status of data ingestion from various sources.	d indicating the health and latency of data feeds (e.g., sensor data, weather API).		
		USN-19	As an administrator, I can view system performance metrics and logs.	I can access dashboards showing server load, response times, and system error logs.	High	Sprint-2
Customer Care Executive	User Support	USN-20	As a customer care executive, I can view user registration details to assist with login issues.	I can look up a user's basic registration information to verify their account.	High	Sprint-1
		USN-21	As a customer	I can initiate a	High	Sprint-1

			care executive , I can reset a user's password if they forget it.	password reset process for a user, sending a link to their registere d email.		
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