TAABI FUEL MANAGEMENT SOLUTION- CASE STUDY

CONTENT

1) PRODUCT REQUIREMENTS DOCUMENTS

PRODUCT TITLE	Taabi Fuel Management Platform
AUTHOR	Product Manager Name
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ADDRESS	123 Mumbai, Maharashtra, 400078
DATE	MM/DD/YY

OVERVIEW

Purpose

Taabi Fuel Management Dashboard is a comprehensive solution designed to provide real-time fuel tracking, analysis, and optimization for large transportation fleets.

Business Goals

Deliver fuel savings of 5-10% for customers

Provide actionable insights into fleet fuel consumption

Enhance operational efficiency for transportation companies

PRODUCT OBJECTIVES

OBJECTIVE 1	Provide real-time tracking of fuel levels for all vehicles.
OBJECTIVE 2	Identify and classify events causing sudden changes in fuel levels (e.g., refueling, theft).
OBJECTIVE 3	Enable comparative analysis of fuel efficiency (KMPL) across vehicles and time periods.

OBJECTIVE 4	Facilitate access to detailed data for specific fuel events.
OBJECTIVE 5	Showcase Return on Investment (RoI) from Taabi's fuel solutions.

STAKEHOLDERS IDENTIFICATION

NAME	ROLE	RESPONSIBILITY	INTERESTS IN THE PRODUCT
Fleet Managers	Primary Users	Monitor fuel levels, detect anomalies, track RoI.	Enhance operational efficiency, reduce costs.
Full-Stack Developers	Technical Team	Develop and implement dashboard features.	Deliver a scalable, user-friendly product.
QA Lead	Quality Assurance	Ensure the feature meets functional specifications.	Minimize bugs, ensure reliability.
IoT Hardware Vendors	External Stakeholders	Provide reliable fuel sensor hardware and support.	Ensure accurate data delivery.

FUNCTIONAL REQUIREMENTS

Feature 1: **Real-Time Fuel Tracking**	Display current fuel levels for all vehicles in the fleet. Support historical time period selection (daily, weekly, monthly, custom range)
Feature 2: **Fuel Event Analysis**	Detect sudden changes in fuel levels (ex- theft, refueling). Classify and segregate events by type (ex- Refueling Events).
Feature 3: **Vehicle Performance Comparison**	Mileage comparison KMPL data across vehicles by make and model. Best and worst-performing vehicles, average fuel consumption by vehicle type.

Feature 4: **Event Information Access**	Enable users to drill down into event details, including time, location and type.
Feature 5: **RoI Dashboard**	Calculate and display RoI for Taabi's fuel solutions, Including: (Total fuel savings over time, Savings per vehicle and fleet-wide)
Feature 6: **Alerts and Notifications**	Provide automated alerts for anomalies, such as unexpected fuel depletion or irregular refueling. Support SMS and email notifications.

NON-FUNCTIONAL REQUIREMENTS

Scalability	Support up to 500 vehicles per fleet.
Performance	Real-time updates with <5-second latency
Usability	Ensure a simple, intuitive interface suitable for non-technical fleet managers.
Security	AES-256 encryption for sensitive data. Compliance with GDPR for data privacy.

IOT-INTEGRATION REQUIREMENTS

Fuel sensors must communicate data via MQTT or HTTP protocols
The system must handle real-time data streams with 99% accuracy
Sensors should transmit data every 30 seconds to ensure timely updates

GEO-DATA ANALYSIS

Integrate mapping APIs to visualize fuel events geographically.
Use GIS tools for location-based fuel efficiency analysis.

PREDICTIVE MAINTENANCE

Utilize fuel data to provide insights into maintenance schedules
Flag potential anomalies that may indicate hardware or vehicle issues

ASSUMPTIONS AND CONSTRAINTS

ASSUMPTIONS
Fuel sensors are pre-installed and functional.
The IoT infrastructure is stable and reliable for data transmission.
CONSTRAINTS
Development budget: Limited to $250,000, must be completed within 4 weeks.
Limited team capacity: 3 developers and 1 QA lead.

DEPENDENCIES

DEPENDENCY 1	Integration with IoT fuel sensors and telematics devices.
DEPENDENCY 2	Mapping API for event visualization (e.g., Google Maps or OpenStreetMap).
DEPENDENCY 3	Cloud storage for historical data analysis.

ACCEPTANCE CRITERIA

FUEL LEVEL TRACKING	Real-time fuel tracking updates within 5 seconds of changes.
EVENT CLASSIFICATION	Event classification achieves 95% accuracy.
COMPARISON	Comparative analysis reflects KMPL trends across vehicles and time periods.
ROI	RoI calculations provide actionable insights for users.
EVENT ALERTS	Alerts and notifications are delivered promptly for critical events.

RISK ANALYSIS

RISK	MITIGATION
Delays due to sensor data inconsistencies.	Build robust error-checking and data validation mechanisms.
Time constraints for feature delivery.	Focus on critical features first, with secondary features planned for future releases.
Network downtime impacting real-time updates.	Implement edge computing to cache and process data locally in case of network issues.

PRIORITY AND EFFORT

REQUIREMENT	PRIORITY LEVEL	EFFORT REQUIRED
Real-time Fuel Tracking	**High**	Estimated effort - 2 Weeks
Event detection and classification	**High**	Estimated effort - 1.5 Weeks
Event Alerts	**High**	Estimated effort - 0.5 Week
Comparative Analysis	**Medium**	Estimated effort - 1 Week

ROI Dashboard	**Medium**	Estimated effort - 1 Week
Geospatial Tracking	**Low**	Estimated effort -0.5 Week

VERSION HISTORY AND CHANGE LOG

VERSION	EDITS COMPLETED BY	DATE	DESCRIPTION
1.00	Utkarsh Singh	MM/DD/YY	Initial PRD draft
1.10	Sasha P.	MM/DD/YY	Added stakeholder details

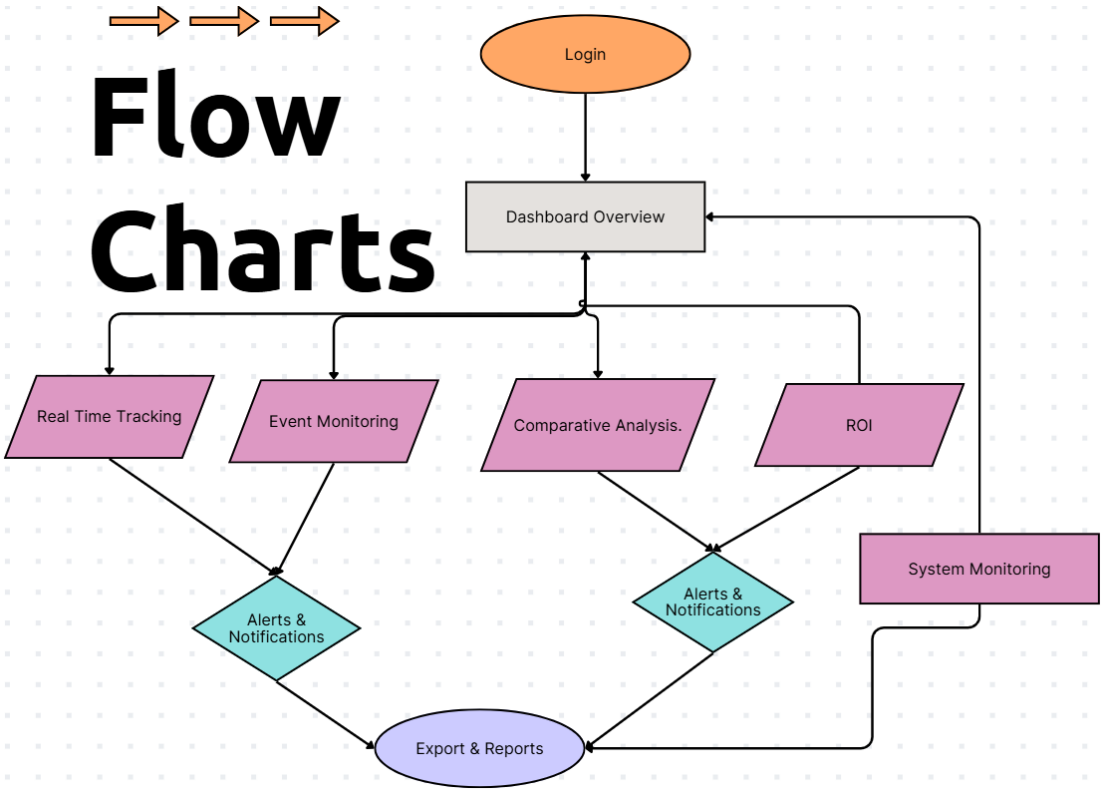
USER

WIREFRAMES

Web Platform User Journey:

1. Login/Authentication
2. Vehicle Selection
3. Real time fuel graph
4. Fuel Event Analysis
5. Comparison and Analysis
6. RoI Tracking

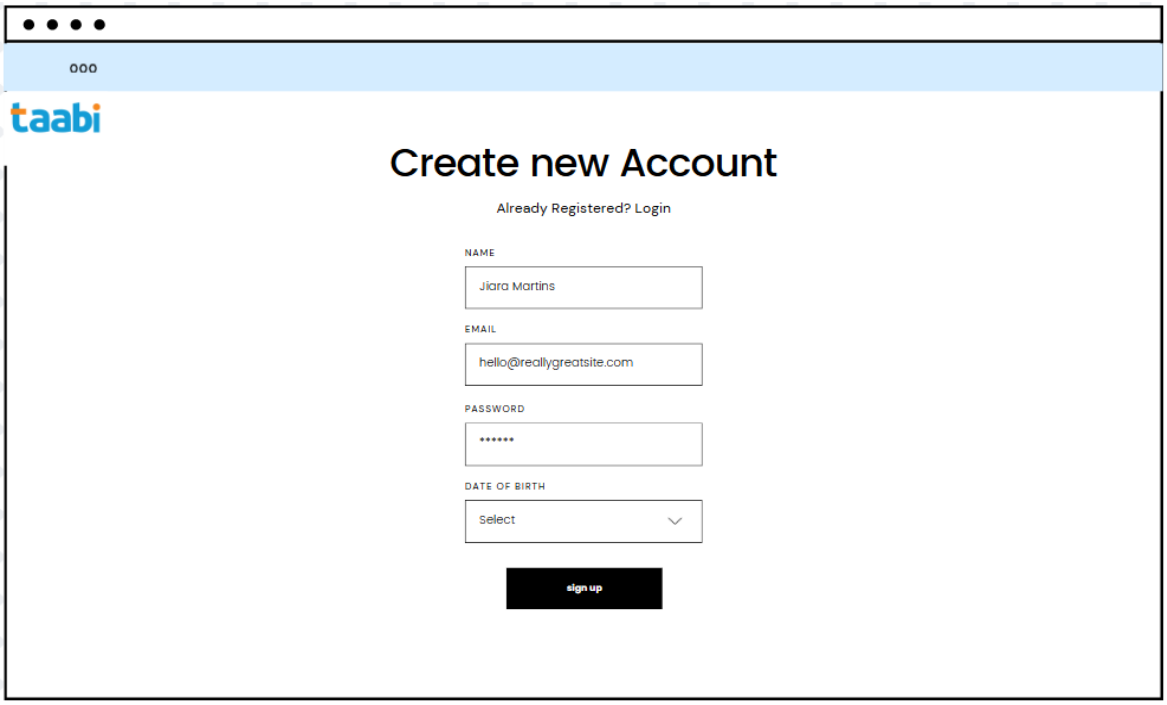
User Flow Diagram for Fuel Dashboard Feature



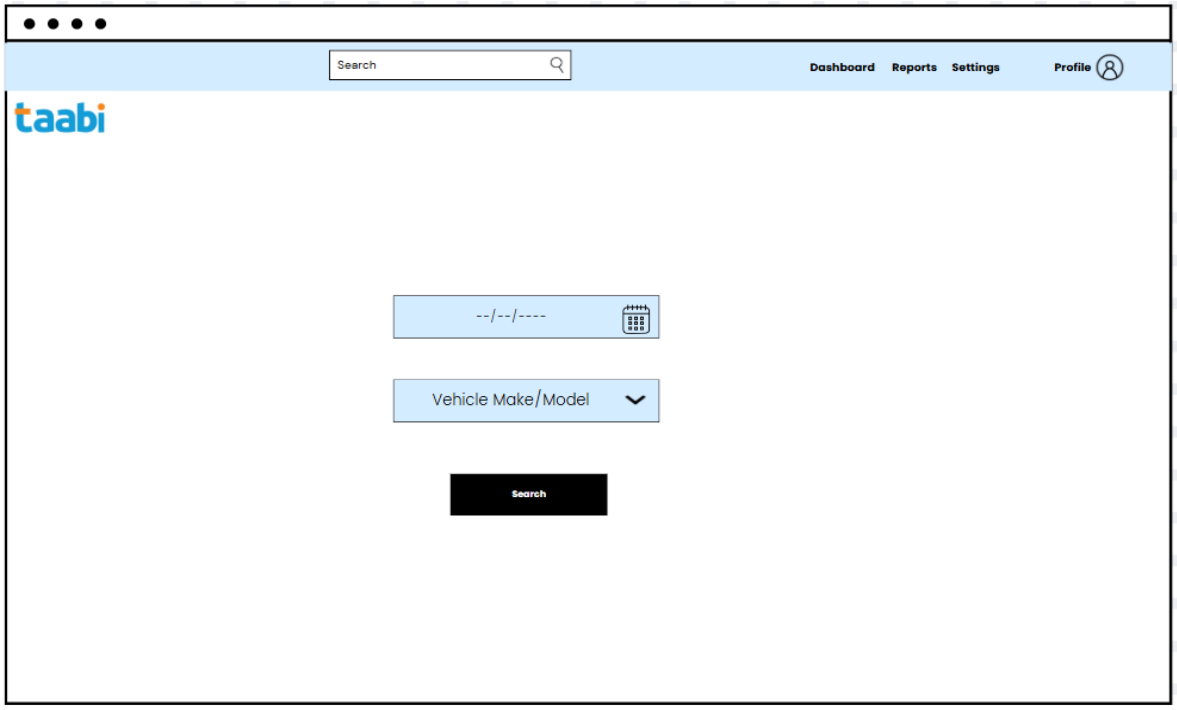
Web Platform Wireframes:

Link of the Design:
https://www.canva.com/design/DAGYuH5xTA8/1f6KepF9NvavcnrqiiAERg/view?utm_content=DAGYuH5xTA8&utm_campaign=designshare&utm_medium=link2&utm_source=uniquelinks&utlId=h90a118e63e

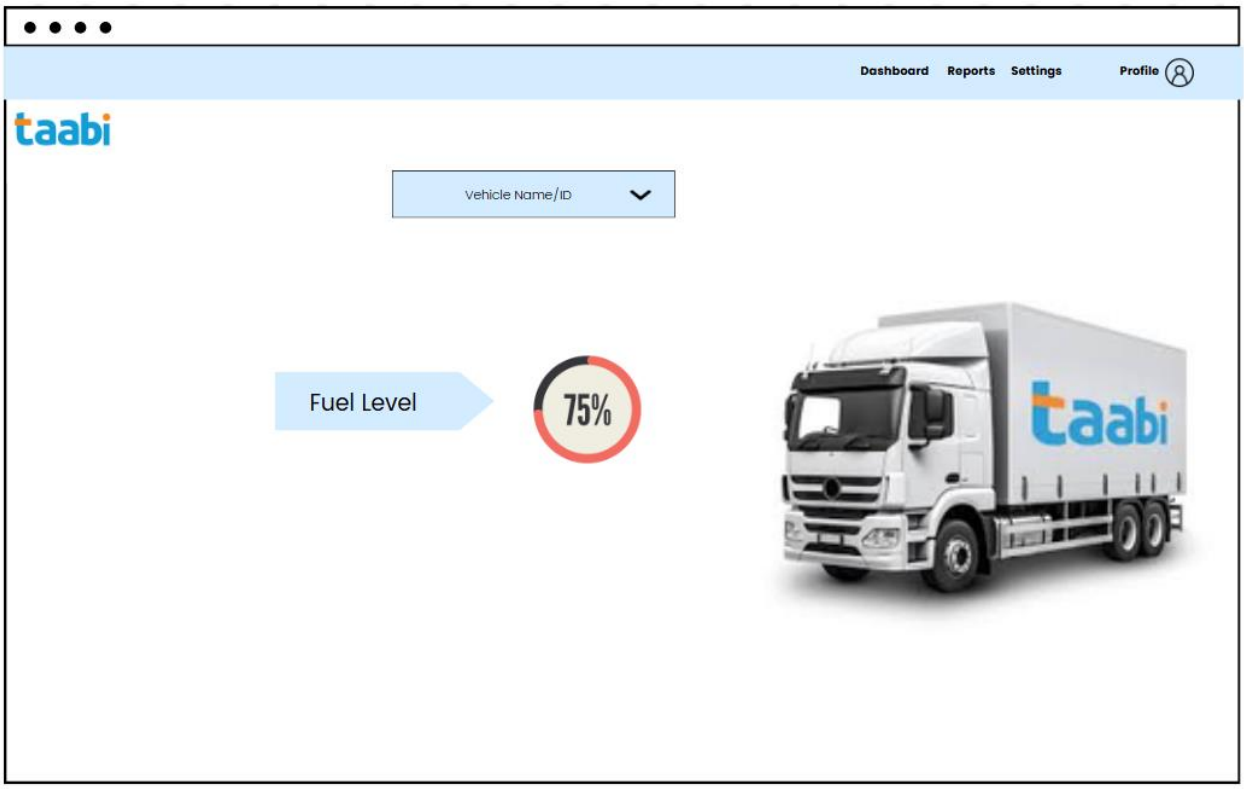
1. Login/Authentication



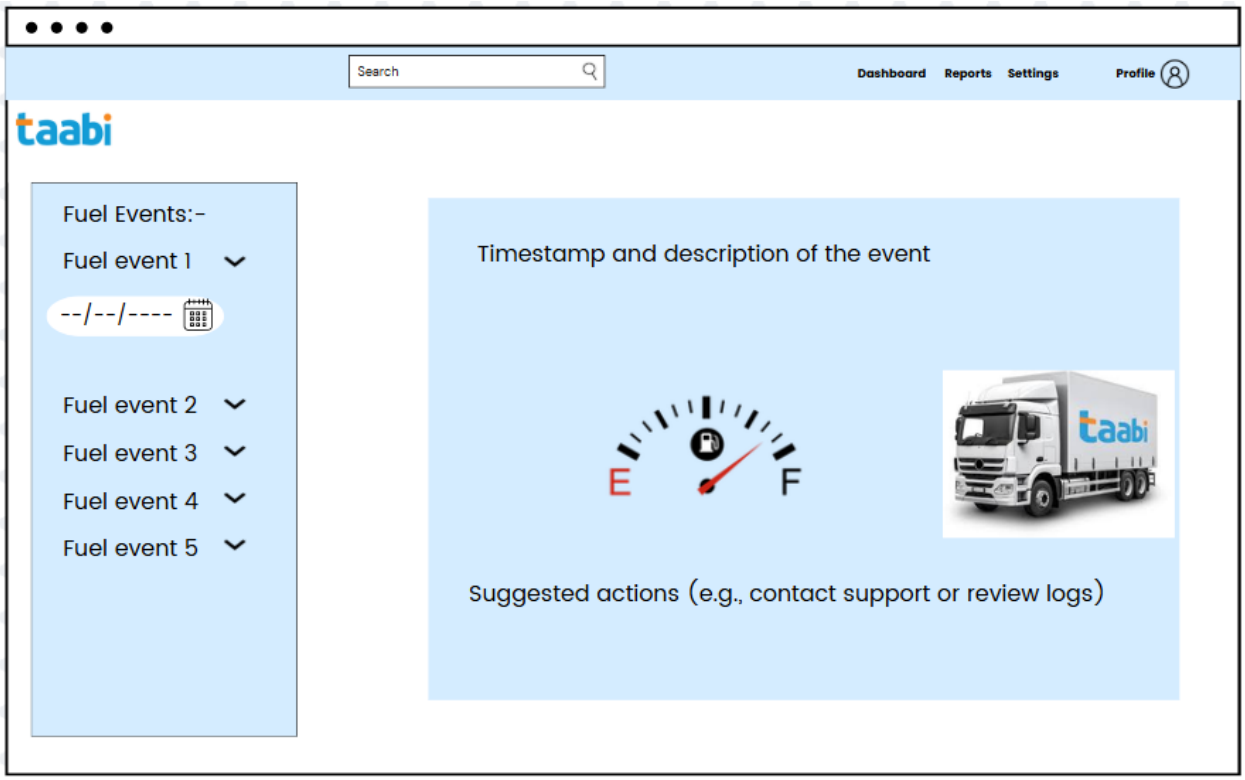
2. Vehicle Selection



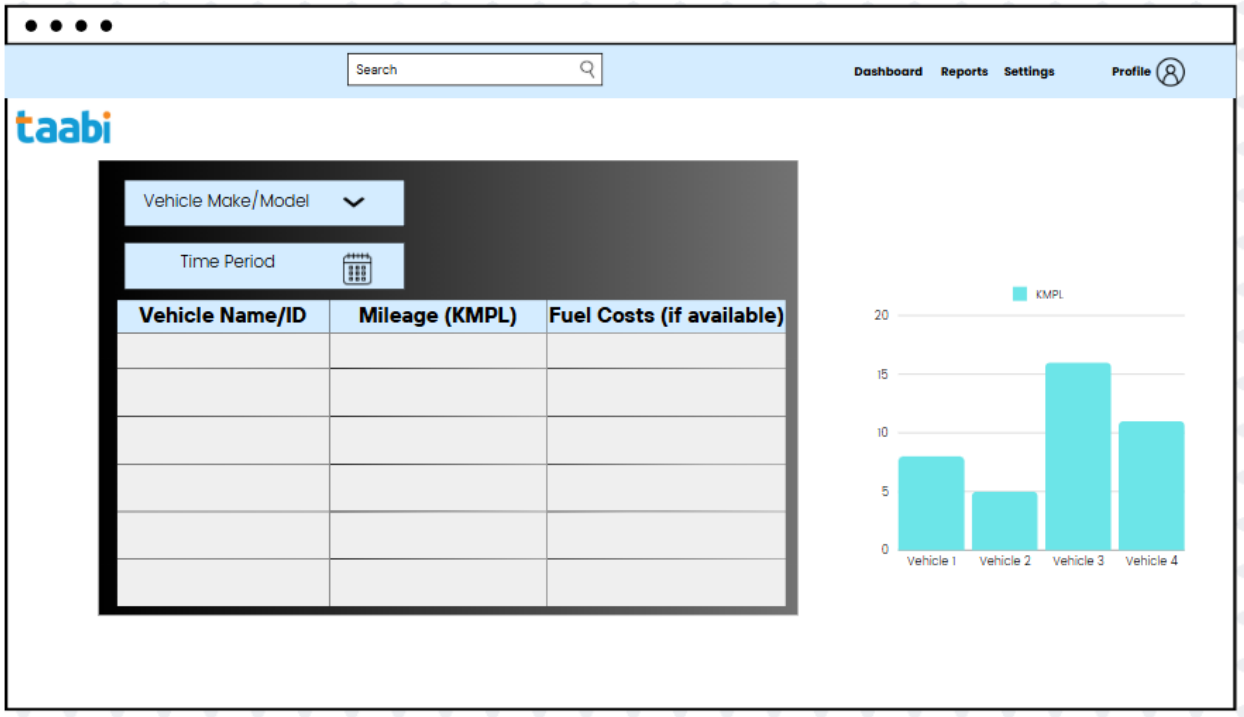
3. Real time fuel graph



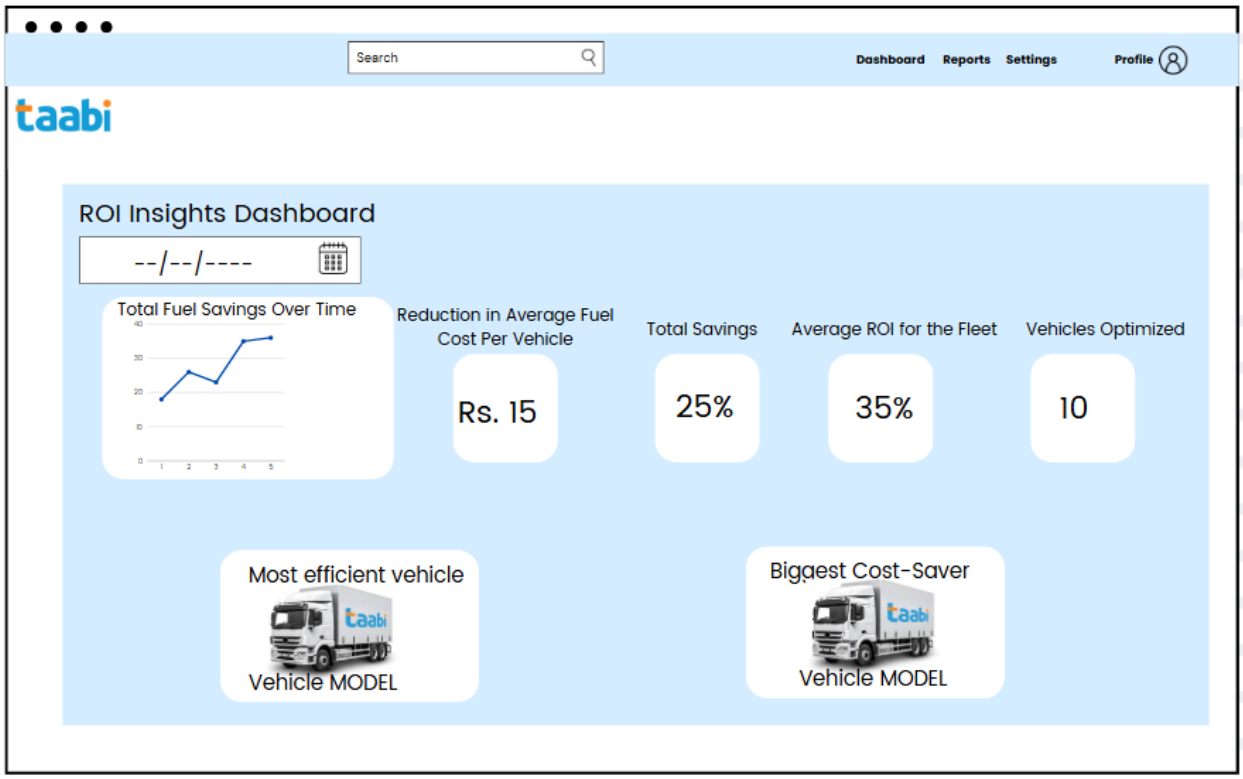
4. Fuel Event Analysis



5. Comparison and Analysis



6. RoI Tracking

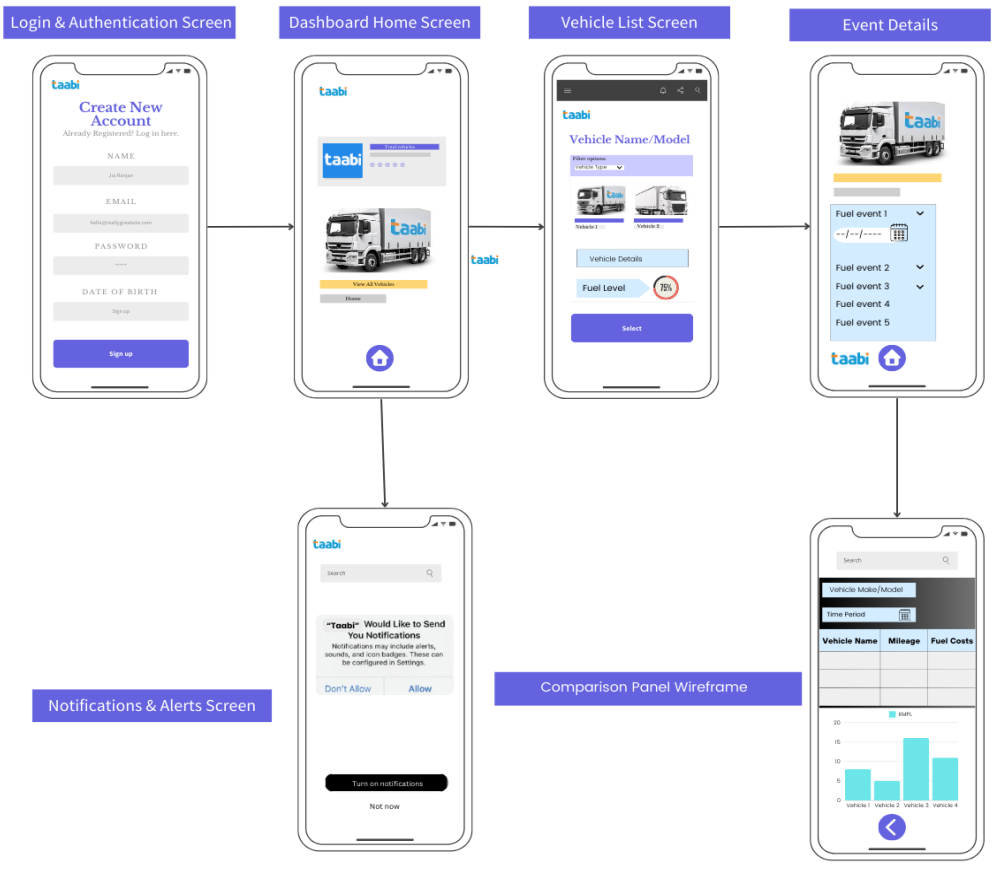


MOBILE WIREFRAMES

Mobile Platform User Journey:

1. Quick Login
2. Fleet Summary
3. Notification Center
4. Event Details
5. Basic Comparison View

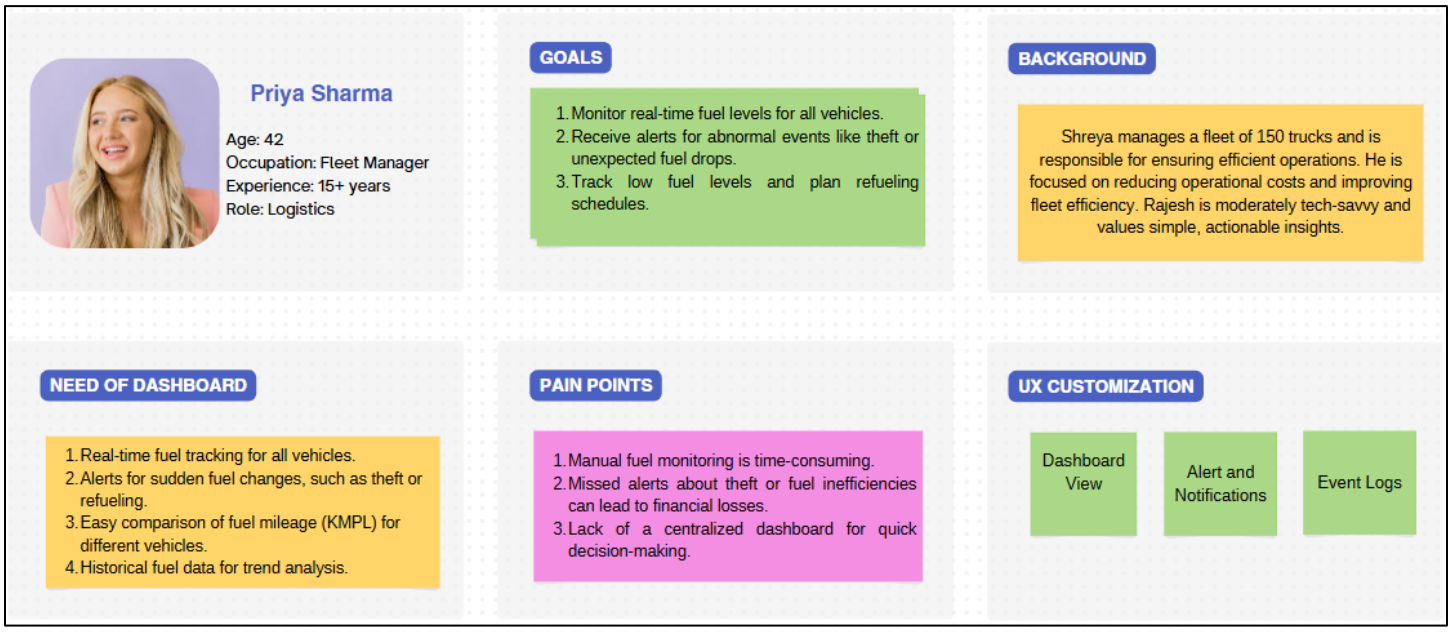
Mobile Platform Wireframes:
Link:https://www.canva.com/design/DAGY8fbPznU/f4fm9mYByzhZe9cw87CguQ/edit?utm_content=DAGY8fbPznU&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton



2) TAABI FUEL MANAGEMENT DASHBOARD- USER PERSONAS

These are the key personas that will use the **Fuel Dashboard** feature on the **Taabi platform**. Each of the personas has specific goals, needs and pain points to be addressed so that the feature will add value to all stakeholders.

A) FLEET MANAGER-PRIYA SHARMA



B) LOGISTICS ANALYST- SURESH KUMAR

Description:
The Logistic Analyst is responsible for analyzing data trends to enhance fleet efficiency, optimize fuel usage, and pinpointing underperforming vehicles.

GOAL	Compare fuel efficiency (KMPL) across vehicles and time periods. Analyze historical data to identify long-term fuel usage patterns. Generate actionable insights for operational improvements.
PAIN POINTS	Difficulty in identifying trends from raw data. Lack of accessible reports to share with management. Inconsistent or incomplete historical data.

UX CUSTOMIZATION	**Comparative Analysis**: Interactive graphs for KMPL trends across make, model, and vehicle. Filters for weekly, monthly, and custom date ranges. **Export Options**: Downloadable reports in Excel/CSV formats for data sharing. **Historical Data View**: Easy toggling between time periods for identifying consumption trends.

C) MAINTENANCE MANAGER- AMIT PATEL

Description:
The Maintenance Manager ensures that vehicles are functioning efficiently and addresses issues like fuel theft or inefficiencies caused by poor maintenance.

GOAL	Detect and address fuel theft or unauthorized usage. Monitor fuel consumption patterns to predict maintenance needs. Reduce downtime caused by vehicle inefficiencies.
PAIN POINTS	Limited visibility into event causes like fuel theft. Inefficient maintenance planning due to missing insights. Difficulty correlating fuel usage with vehicle health.
UX CUSTOMIZATION	**Alerts and Logs**: Detailed theft alerts with geolocation and driver info. Event logs with annotations for future reference. **Predictive Maintenance**: Insights on abnormal fuel usage tied to vehicle issues. Notifications for potential maintenance based on fuel trends.

D) IT SUPPORT- VISHNU GOPI

Description:
The IT Support Lead monitors the system's technical performance, resolves issues, and ensures data consistency.

GOAL	Detect and resolve issues like sensor malfunctions or data flow disruptions. Maintain system uptime and accuracy for seamless operation. Troubleshoot anomalies quickly using system logs

PAIN POINTS	Reactive issue resolution leads to downtime. Insufficient monitoring tools for tracking system performance. Inconsistent data from IoT sensors complicates troubleshooting.
UX CUSTOMIZATION	**System Monitoring Dashboard**: Real-time view of sensor status and data transmission. Alerts for offline sensors or delayed data updates. **Error Logs**: Detailed logs for quick troubleshooting. Notifications for critical system issues requiring immediate action.

SUMMARY OF UX CUSTOMIZATION

Persona	Key Features for UX Customization
Fleet Manager	Real-time dashboard, anomaly alerts, quick-access event logs
Logistics Analyst	KMPL comparative analysis, historical trends, exportable data
Maintenance Manager	Theft detection, predictive maintenance insights, annotated event logs
Senior Management	ROI visualizations, high-level summaries, tailored executive reports
IT Support	Real-time system monitoring, detailed error logs, alerts for system malfunctions

3) TAABI FUEL MANAGEMENT DASHBOARD- USER STORIES

These user stories define the core functionality for the **Fuel Dashboard** feature, addressing the unique needs of different stakeholders. The acceptance criteria ensure that the product delivers value, is user-friendly, and provides actionable insights to all involved users.

A) EPIC 1: REAL TIME FUEL TRACKING

User Story 1: Dashboard Overview Visualization

DESCRIPTION	**As a** Fleet Manager, **I want** to see the real-time fuel levels of all my vehicles, **so that** I can monitor the fuel usage of the entire fleet and take action if any vehicle is using fuel inefficiently.
ACCEPTANCE CRITERIA	1. The system should display the current fuel level for each vehicle. 2. Categorize fuel events into: Refueling Events, Sudden Fuel Level Changes, Idle Time Fuel Consumption 3. Highlight vehicles with low fuel levels 4. Refresh data every 5 minutes 5. Support filtering by vehicle type/location

User Story 2: Historical Fuel Level Tracking

DESCRIPTION	**As a** Transportation Company Owner, **I want** to track fuel levels for any historical time period, **So that** I can analyze long-term fuel consumption patterns
ACCEPTANCE CRITERIA	1. Date range selector with preset and custom options 2. Ability to select: Daily, Weekly, Monthly view and Custom date range 3. Graphical representation of fuel levels 4. Ability to compare multiple time periods 5. Export functionality for selected data

B) EPIC 2: FUEL EVENT MONITORING

User Story 3: Event Detection and Automation

DESCRIPTION	**As a** Fleet Manager, **I want** to be notified about any sudden changes in fuel levels and have these changes categorized by event type (e.g., refueling, theft), **so that** I can quickly identify and address any irregularities
	1. Automatically classify fuel events 2. Event types: Refueling, Fuel Drop, Potential Theft

ACCEPTANCE CRITERIA	3. Provide detailed event information 4. Generate alerts for suspicious events 5. Support manual event annotation

User Story 4: Event Alerts

DESCRIPTION	**As a** Fleet Maintenance Manager **I want** to be alerted about potential fuel theft or unauthorized fuel usage **So that** I can quickly investigate and prevent financial losses
ACCEPTANCE CRITERIA	Alerts are triggered for: 1. Theft indicators (unexpected fuel drop >10%). 2. Refueling anomalies (unregistered locations). Alerts include: 1. Vehicle ID, Geolocation, Timestamp. 2. Notifications are sent via: Email, SMS

C) EPIC 3: COMPARATIVE ANALYSIS

User Story 5: Vehicle Efficiency Trends

DESCRIPTION	**As a** Logistics Analyst, **I want** to compare the fuel efficiency (KMPL) of different vehicles, **so that** I can identify underperforming vehicles and recommend optimizations.
ACCEPTANCE CRITERIA	1. The system should allow the Logistics Analyst to compare the fuel efficiency of vehicles by make, model, and time period. 2. The comparison should display a graphical representation (ex- bar chart) of fuel efficiency trends. 3. The Analyst should be able to filter data by date ranges (ex- weekly, monthly).

User Story 6: Comparative Cost Analysis

DESCRIPTION	**As a** Financial Controller **I want** to understand the financial impact of vehicle fuel efficiency **So that** I can make data-driven decisions about fleet management
ACCEPTANCE CRITERIA	1. Calculate and display: ➢ Fuel cost per vehicle ➢ Potential savings by replacing inefficient vehicles ➢ Comparative cost analysis 2. Projection of annual fuel expenses 3. ROI calculations for fuel management solution 4. Exportable financial summaries

D) EPIC 4: ROI DASHBOARD

User Story 7: ROI Summary

DESCRIPTION	**As a** Senior Management **I want to** understand ROI of fuel management solution **So that** I can justify technology investment
ACCEPTANCE CRITERIA	1. Calculate projected and actual fuel savings 2. Show visualizations (Line graph, pie chart) 3. Reports can be exported for stakeholders.

E) EPIC 5: USER ACCESSIBILITY

User Story 9: Mobile Access

DESCRIPTION	**As a** Mobile-First User

	I want a consistent and intuitive experience across web and mobile platforms **So that** I can access critical fleet information from any device
ACCEPTANCE CRITERIA	1. The dashboard should be mobile-responsive and work across devices. 2. Support key functionalities like Real time tracking, Trends etc. 3. Push notifications for critical alerts.

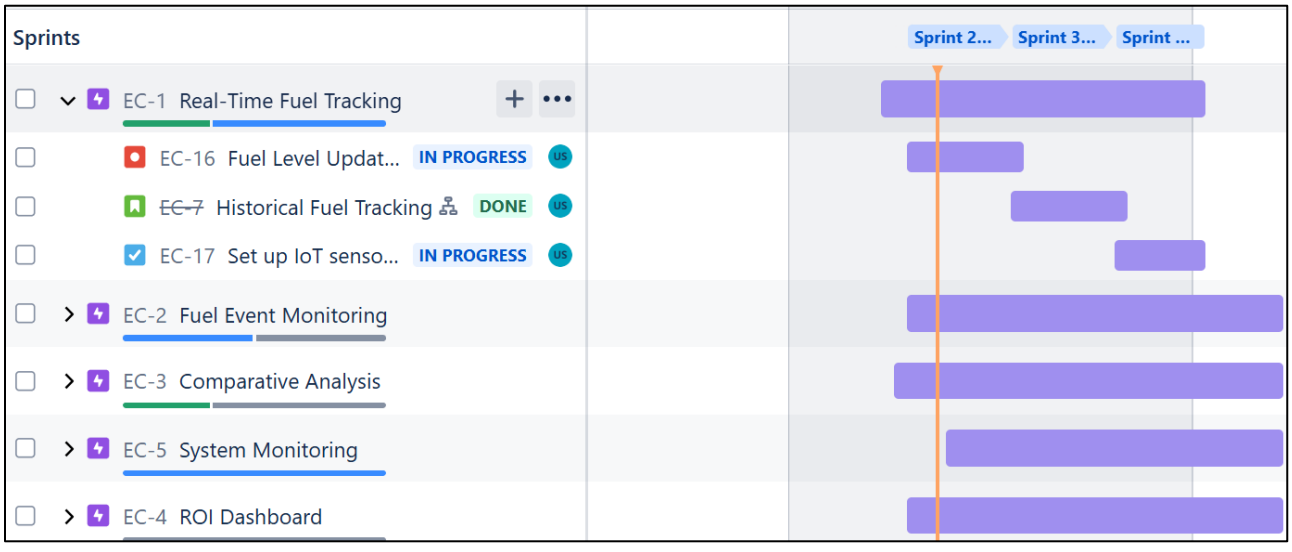
F) EPIC 6: SYSTEM MONITORING

User Story 9: System Performance Dashboard

DESCRIPTION	**As** an IT Support Lead**,** **I** want to monitor the system's real-time performance**,** **so** that I can quickly detect and resolve issues like sensor malfunctions.
ACCEPTANCE CRITERIA	1. Display system health metrics: Data flow latency, Sensor uptime, Error rates. 2. Trigger alerts for: Sensors going offline, Data inconsistencies. 3. Logs are viewable and downloadable for analysis.

Epics, User Stories, Tasks, Bugs (Jira Dashboard Backlog)

JIRA Link: https://iitism-team-puzsvwls.atlassian.net/jira/software/projects/EC/boards/1/timeline



4) TAABI FUEL MANAGEMENT DASHBOARD- SPRINT PLANNING

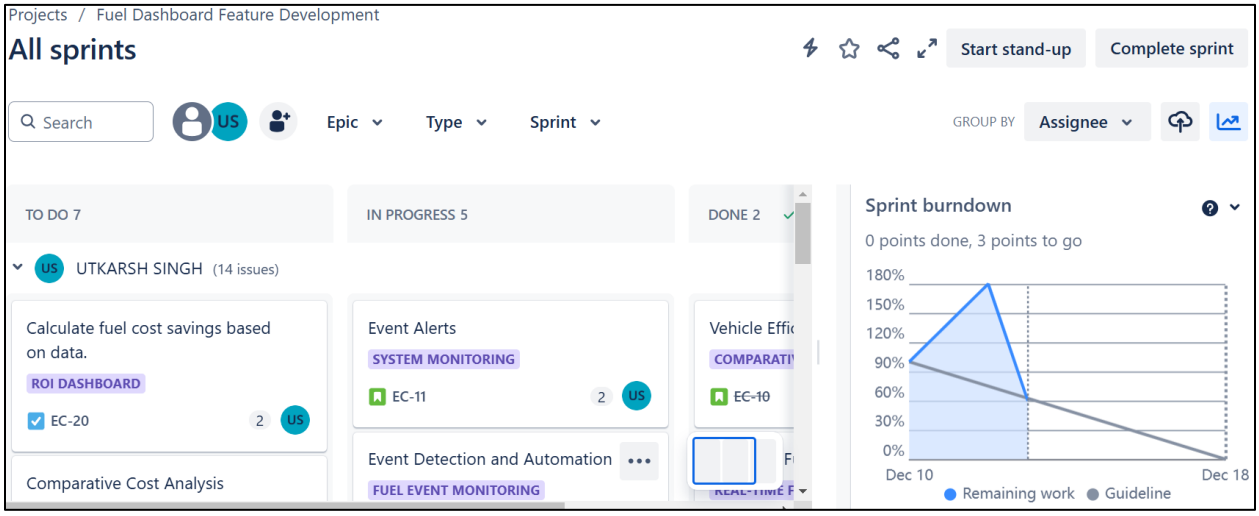
This **Sprint Planning** ensures that the team is focused on delivering specific features within each sprint while also allowing for testing, feedback, and iterative improvements. It also keeps the development within the **4-week timeframe** while maintaining focus on the core functionalities

Overview

DURATION	4 Weeks
TEAM COMPOSITION	3 Full Stack Developers, 1 QA Lead

JIRA Board Configuration

1. Timeline
2. Sprint Backlog
3. In Progress
4. Testing
5. Done



Sprint 1: Core Features Development (Week 1)

Objective:

Develop foundational features: real-time fuel tracking and event detection.

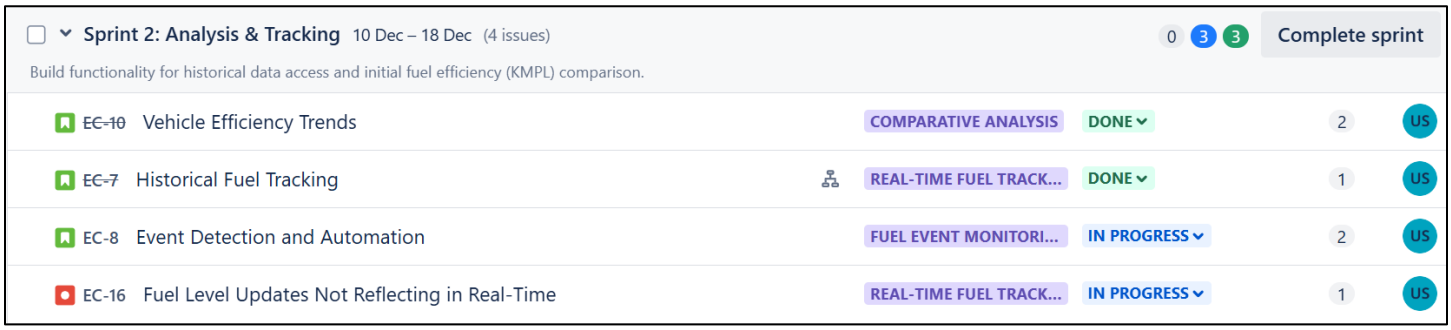
USER STORIES	Real-Time Fuel Overview. Automatic Event Detection.
DEVELOPMENT	Backend: Integrate IoT sensors and handle real-time data streams. (2 days) Frontend: Build a real-time dashboard to display fuel levels (1 day) Event Detection: Implement logic for detecting refueling, theft, and sudden drops. (1 day)
TESTING	Validate real-time updates and data refresh rates (0.5 day) Test event detection logic accuracy (0.5 day)

Sprint 2: Analysis and Historical Tracking (Week 2)

Objective:

Develop foundational features: real-time fuel tracking and event detection.

USER STORIES	Historical Fuel Tracking Vehicle Efficiency Trends
DEVELOPMENT	Backend: Build APIs to retrieve and aggregate historical data (2 days) Frontend: Design graphs and filters for comparative analysis (1.5 days)
TESTING	Validate historical data retrieval accuracy (0.5 day) Test KMPL comparison and trends visualization (0.5 day)

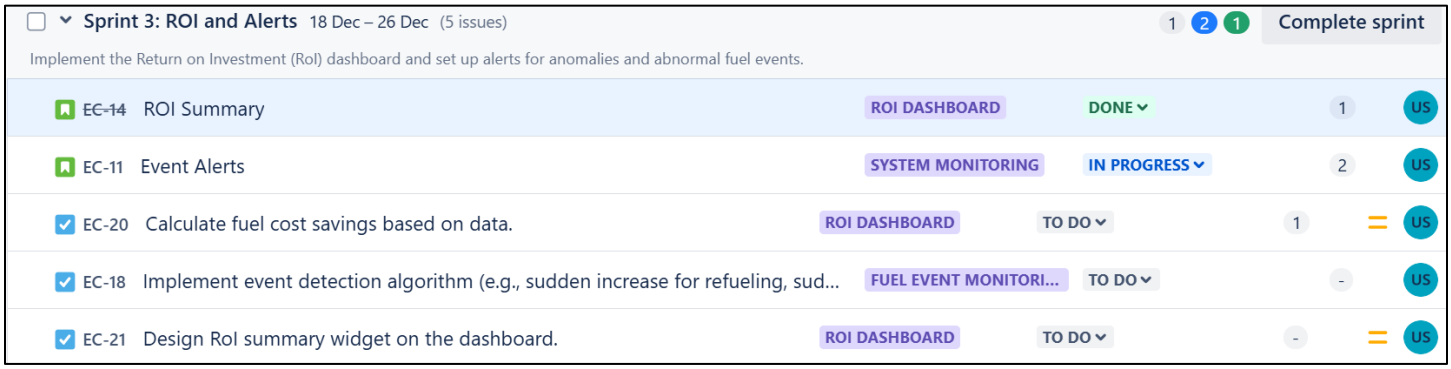


Sprint 3: ROI and Alerts (Week 2)

Objective:

Develop the ROI dashboard and implement the alerts system

USER STORIES	ROI Summary Event Alerts
DEVELOPMENT	Backend: Calculate ROI metrics and integrate alert thresholds (1.5 days) Frontend: Design the ROI dashboard with exportable reports (1 day) Alerts: Implement SMS/email notifications for critical events (1 day)
TESTING	Validate ROI calculations and metrics display (0.5 day) Test alert triggers and notification delivery (0.5 day)

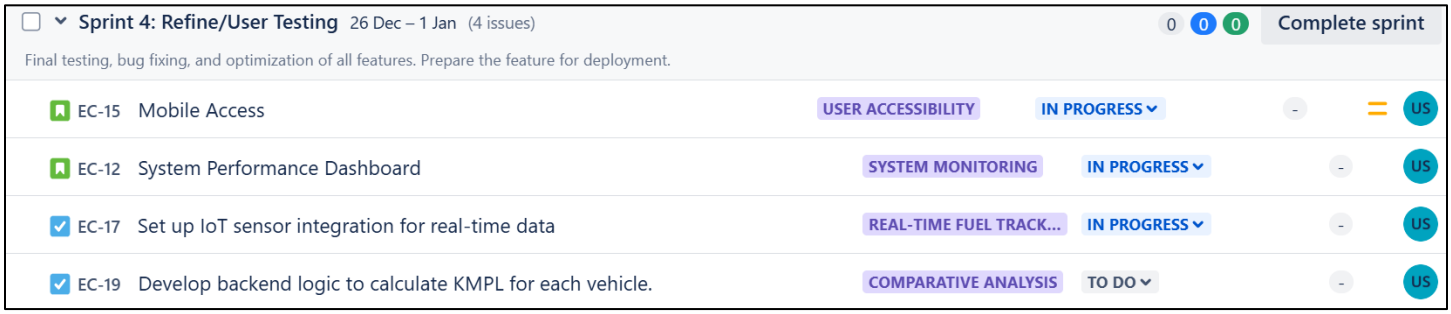


Sprint 4: Final Testing and Deployment (Week 4)

Objective:

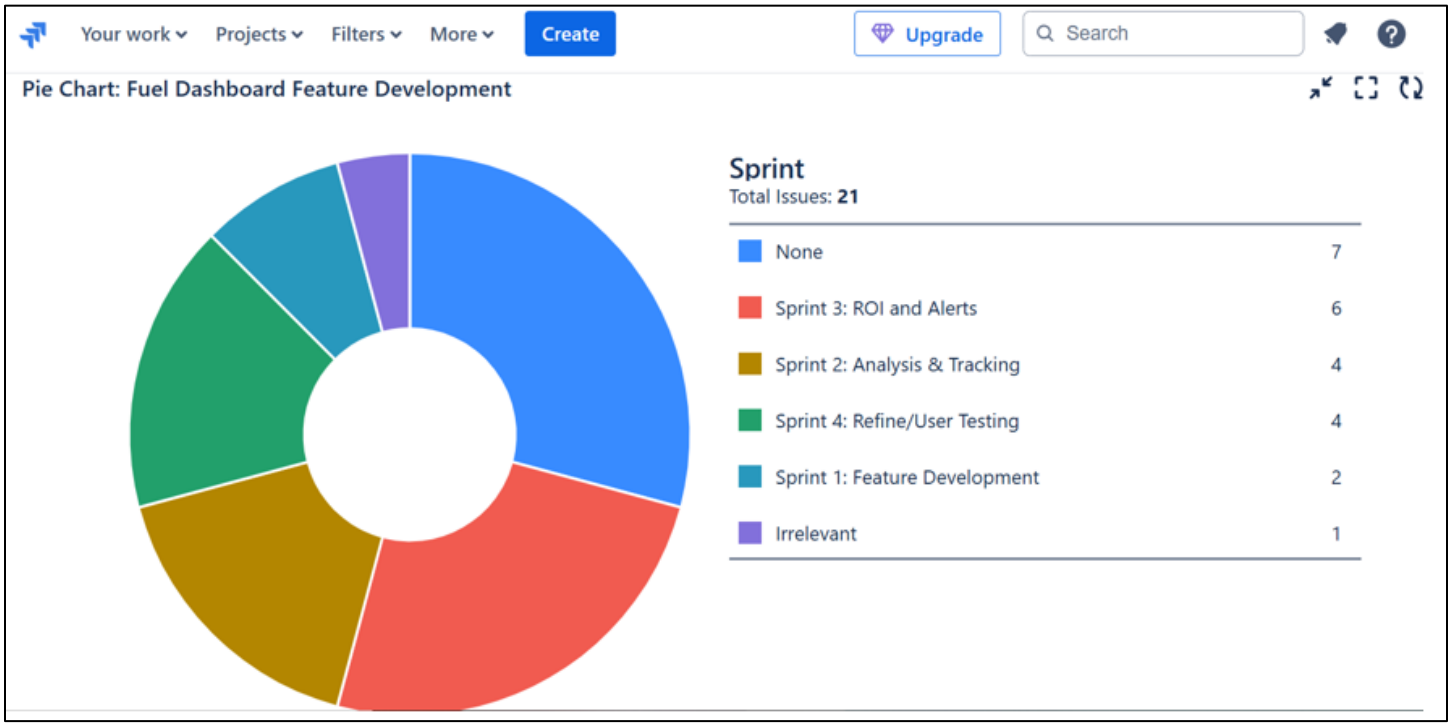
Optimize performance, ensure mobile compatibility, and finalize for release.

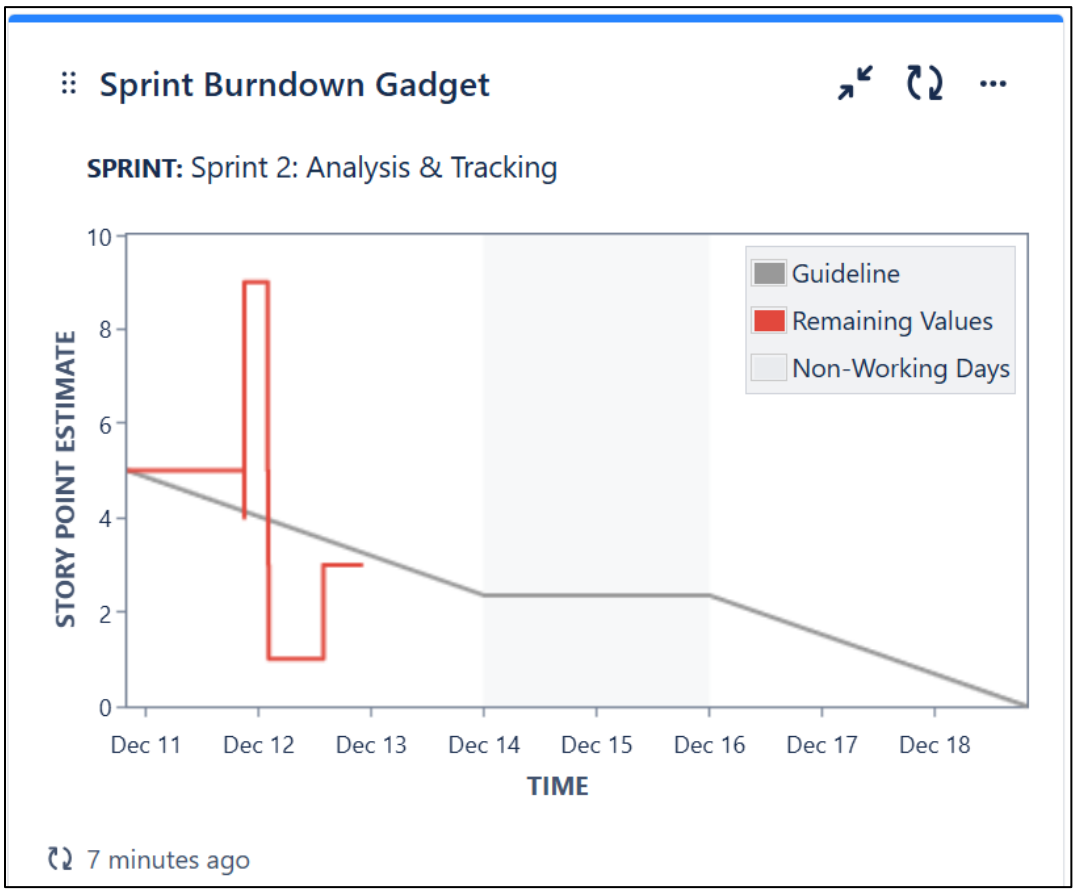
USER STORIES	Mobile Access System Monitoring Dashboard
DEVELOPMENT	Mobile: Make the dashboard responsive for mobile devices (1 day) Monitoring: Develop real-time system performance metrics (1.5 days) Add export functionality (Excel/CSV) (1 day)
TESTING	Perform end-to-end testing, including UAT (1 day) Test load handling for up to 500 vehicles (0.5 day)

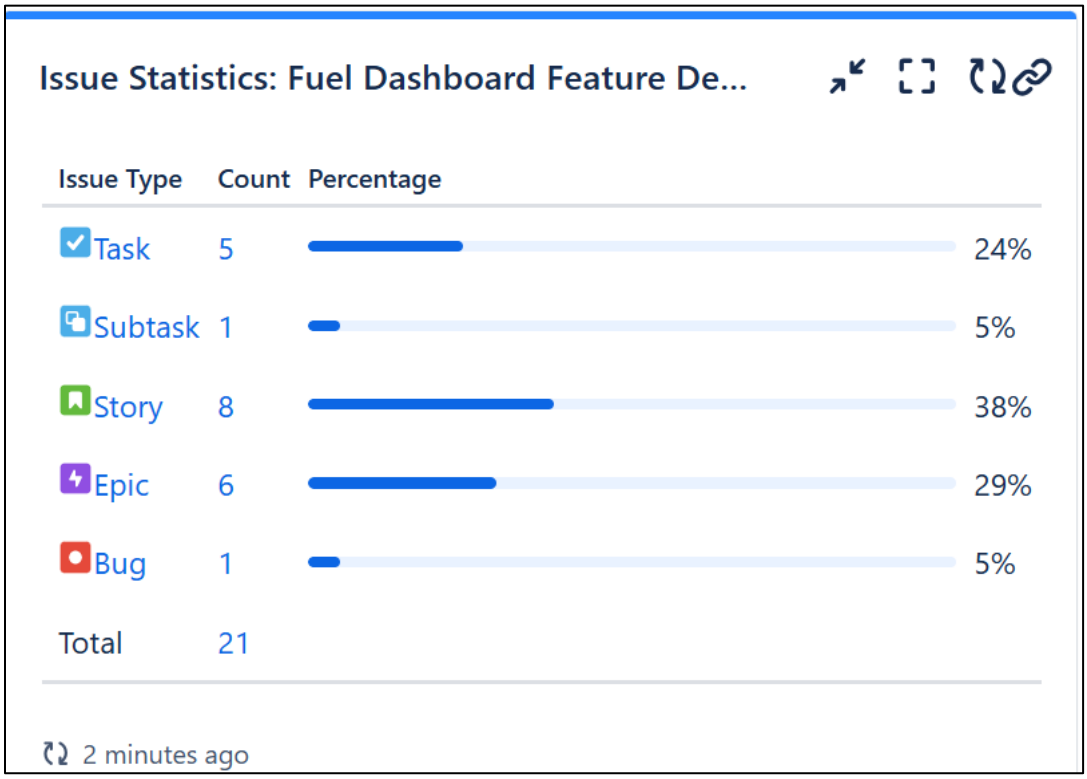


JIRA Dashboard for Tracking

DASHBOARD LINK: https://iitism-team-puzsvwls.atlassian.net/jira/dashboards/10001


Your work
Projects
Filters
More
Create
Upgrade
Search
Pie Chart: Fuel Dashboard Feature Development
Sprint
Total Issues: 21
None 7
Sprint 3: ROI and Alerts 6
Sprint 2: Analysis & Tracking 4
Sprint 4: Refine/User Testing 4
Sprint 1: Feature Development 2
Irrelevant 1

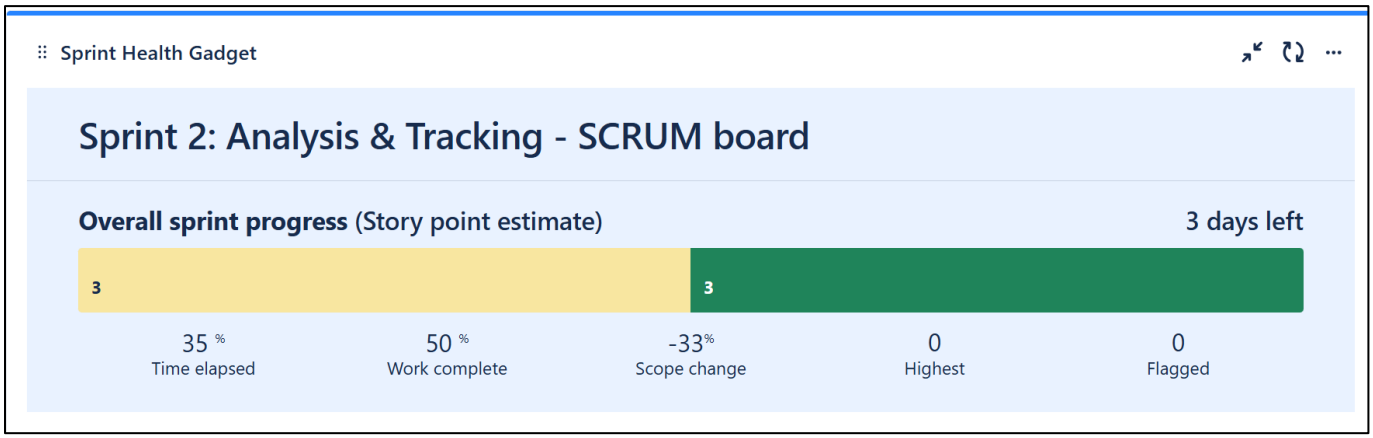

Sprint Burndown Gadget
SPRINT: Sprint 2: Analysis & Tracking
Guideline
Remaining Values
Non-Working Days
STORY POINT ESTIMATE
10
8
6
4
2
0
Dec 11
Dec 12
Dec 13
Dec 14
Dec 15
Dec 16
Dec 17
Dec 18
TIME
7 minutes ago



Issue Statistics: Fuel Dashboard Feature De...

Issue Type	Count	Percentage
Task	5	24%
Subtask	1	5%
Story	8	38%
Epic	6	29%
Bug	1	5%
Total	21	

2 minutes ago



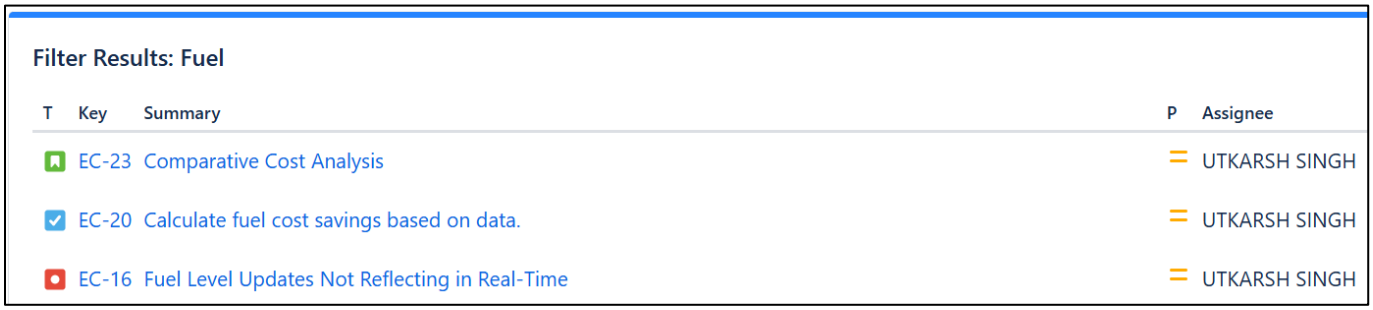
Sprint Health Gadget

Sprint 2: Analysis & Tracking - SCRUM board

Overall sprint progress (Story point estimate) 3 days left

3 3

35 %	50 %	-33%	0	0
Time elapsed	Work complete	Scope change	Highest	Flagged



Filter Results: Fuel

T	Key	Summary	P	Assignee
	EC-23	Comparative Cost Analysis	=	UTKARSH SINGH
	EC-20	Calculate fuel cost savings based on data.	=	UTKARSH SINGH
	EC-16	Fuel Level Updates Not Reflecting in Real-Time	=	UTKARSH SINGH

5) TAABI FUEL MANAGEMENT DASHBOARD - COMMUNICATION AND SYNC-UP STRATEGY

Robust sync-up process is essential for seamless communication between the tech team and stakeholders. This process ensures the **Fuel Dashboard Feature** is delivered **on time, bug-free**, and with a **great user experience**.

Step 1: Clear Roles and Responsibilities

Tech Team:

DEVELOPERS	In charge of testing, coding, and problem-solving.
QA LEAD	Validates functionality, identifies bugs, and ensures a quality release.
TESTING	Oversees technical progress, resolves blockers, and communicates with stakeholders.

Stakeholders:

PRODUCT MANAGERS	Ensures features align with business goals
UX/UI DESIGNERS	Provides feedback on user experience and visual design
STAKEHOLDERS	Confirms that deliverables satisfy market demands.

Step 2: Establish Sync-Up Meetings

Daily Stand-Ups (15 minutes):

PARTICIPANTS	Entire tech team
GOAL	Track daily progress, resolve blockers quickly, and ensure team alignment.

Mid-Sprint Sync-Up (30 minutes):

PARTICIPANTS	Product Manager, Tech Lead, QA Lead
GOAL	Reduce risks and make sure the sprint doesn't veer off course.

Step 3: Communication Channels and Tools

Real Time Collaborations Tools:

SLACK / MS TEAMS	For instant communication, including bug updates and announcements.
CONFLUENCE	For documenting decisions, sync-up meeting minutes, and user feedback.

Task Tracking:

JIRA	Assign clear ownership for each task. Use tags like Bug, In Progress, or Testing for transparency.

Step 4: Testing and Bug Resolution Process

Bug Reporting and Testing:

QA TESTING	Use a bug-tracking system (Jira) with detailed issue descriptions.
UAT	Conduct User Acceptance Testing with stakeholders

Step 5: Regular Stakeholder Updates

WEEKLY PROGRESS REPORT	Share reports summarizing: Completed tasks, Identified and resolved bugs, Pending tasks and risks Use Jira Dashboard to visualize sprint progress, completed stories, and bug resolution rates

Step 6: Monitoring and Feedback

TOOLS	Use Application Performance Monitoring (APM) tools like Datadog or New Relic to track system health.
FEEDBACK COLLECTION	Implement a system for users to report issues (Ex- in-app feedback form).

Example Sync-Up Calendar

Timeframe	Meeting	Participants	Agenda
Daily (9:00 AM)	Stand-Up	Tech Team, QA Lead, PM	Updates on progress, blockers, and tasks for the day.
Weekly	Sprint Review	Tech Team, QA Lead, Stakeholders	Review completed tasks, demos, and Sprint planning.
Bi-Weekly	Testing Sync-Up	Tech Team, QA Lead	Testing progress and bug prioritization.
Final Week	Pre-Release Review	Tech Team, Stakeholders	Approve the final product for release based on testing and feedback.