

Software Requirements Specification (SRS)

Project Title: Biofuel Plant Weighbridge & Logistics Management System

Client: K2 Biofuels Pvt. Ltd.

Prepared By: [Your Company/Team Name]

Date: [Insert Date]

1. Project Overview

The Biofuel Plant Weighbridge & Logistics Management System is a web-based application designed for K2 Biofuels Pvt. Ltd. to digitize and streamline the end-to-end operations involving raw material intake, goods dispatch, vehicle tracking, vendor coordination, and weighbridge operations across multiple plant locations.

The application will serve three primary user roles: Operators, Supervisors, and Admins. Each role will have distinct permissions, and the application must support robust offline capabilities, multi-plant data separation, and secure receipt generation.

2. Functional Requirements

2.1 User Roles

- **Operator:** Day-to-day data entry, weight recording, vehicle receipt generation.
- **Supervisor:** Plant-level data validation, access to operator logs, reporting.
- **Admin:** Full access, role/user management, system settings.

2.2 General Functionalities

1. **Authentication:** Secure login for Operator, Supervisor, and Admin roles.
2. **Dashboard:**
3. Operator: Summary of today's transactions.
4. Supervisor: Summary of plant activity.
5. Admin: Overview across all plants.
6. **Vehicle Management:**
7. Add/update vehicle details (registration number optional).
8. Associate vehicles with multiple vendors.
9. Assign unique Vehicle ID.
10. **Vendor Management:**
11. Add/update vendor information.
12. Assign inhouse tractors to vendors.
13. **Weighment Operations:**
14. Capture tare and gross weight.
15. Auto-generate net weight.
16. Allow +/- 80kg variance alert.
17. Link receipt with vehicle and vendor.
18. **Receipt Generation:**
19. Digital receipt with unique ID.

- 20. Stored locally for offline access.
 - 21. **Plant Management:**
 - 22. Admin can manage multiple plant locations.
 - 23. Each plant has its own Supervisor and data set.
 - 24. **Data Viewing:**
 - 25. Operator: Only view transactions from past 24 hours.
 - 26. Supervisor/Admin: Full access to historical data.
 - 27. **Offline Support:**
 - 28. Local storage of transaction data.
 - 29. Auto-sync to server when back online.
 - 30. **User Management:**
 - Admin can add/edit/delete operators, supervisors.
 - 31. **Audit Trail:**
 - Log changes and activity by all users.
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3. Non-Functional Requirements

- 1. **Performance:**
 - 2. System should support concurrent operations across multiple plants.
 - 3. **Reliability:**
 - 4. Offline-first architecture for resilience.
 - 5. Graceful fallback in case of hardware failure.
 - 6. **Security:**
 - 7. Role-based access control.
 - 8. HTTPS communication.
 - 9. Local data encryption.
 - 10. **Scalability:**
 - 11. Modular design to add more plants or features.
 - 12. **Usability:**
 - 13. Simple UI for operators.
 - 14. Responsive design for tablets or desktops.
 - 15. **Compliance:**
 - 16. Data stored as per Indian IT & data protection norms.
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4. User Stories / Use Cases

Operator

- As an Operator, I want to log in and record the weight of a vehicle so that I can generate a receipt.
- As an Operator, I want to view only today's transactions to avoid confusion.
- As an Operator, I want the data to be saved offline when network fails.

Supervisor

- As a Supervisor, I want to view all receipts created in my plant for any day.
- As a Supervisor, I want to see weight variances highlighted.

Admin

- As an Admin, I want to manage users, vendors, vehicles, and plant data.
 - As an Admin, I want to view analytics across all plants.
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5. Additional Notes

Assumptions

- Each plant operates independently with its own weighbridge.
- Data from digital weighbridge is transmitted to backend via serial-to-USB connector on local PC.
- App is built using Next.js for both frontend and backend.

Dependencies

- Digital Weighbridge (must support serial output).
- Node.js environment for hosting Next.js.

Constraints

- Vehicles may or may not have registration numbers.
- Weight variance tolerance: 80kg.

Terms Defined

- **Plant:** A physical location of operations.
 - **Vehicle:** Means of transport used to bring/take goods.
 - **Vendor:** A third-party entity delivering raw material or taking product.
 - **Operator:** The ground staff at weighbridge.
 - **Supervisor:** The plant-level officer managing operator activity.
 - **Admin:** Organization-level access user.
 - **Tare Weight:** Empty vehicle weight.
 - **Gross Weight:** Loaded vehicle weight.
 - **Net Weight:** Gross - Tare.
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