PRODUCTION COST CALCULATOR

Internal Story Document
Project: Production Cost Calculator
Narrative User Flow (All Features)

1. Starting Point: Authentication & Access (FR1–FR5, FR56–FR57)
- A user lands on the login page. They enter email and password. The system authenticates using JWT.
- Depending on role (Admin, Production Manager, Accountant, Staff), the user is redirected to their **dashboard view**.
- JWT tokens expire after set time; refresh handled automatically. If expired, the user is logged out securely.
- Password reset is available through email.
- Audit logs store every login/logout (FR58).

2. Admin Control: User & Role Management (FR2–FR4)
- Admin can access **User Management**.
- They see a list of all users with pagination, search, and filters.
- Admin can create new users, assign roles, reset passwords, or deactivate accounts.
- All changes are logged in the audit trail (FR58).

3. Product Setup (FR6–FR9)
- A Production Manager creates a **Product** with details:
  - Name, SKU, batch sizes, description.
- Multiple batch sizes can be linked to one product.
- Product list supports pagination, sorting, and searching by SKU or name.

4. Raw Materials & Vendor Management (FR10–FR16)
- Manager/Admin navigates to **Raw Materials**.
- They add entries: Material Name, Vendor, Unit Type (kg/litre/pcs), Unit Price, Stock Quantity.
- The system auto-calculates **Total Material Cost = Quantity × Unit Price**.
- Frequently used materials can be saved and re-applied in future batches.
- Alerts trigger when stock drops below threshold (FR14, FR54).
- Vendors are separately managed (name, contact, email, address). Materials link to vendors for tracking cost history.

5. Labor Management (FR17–FR20)
- Manager adds **Labor types**: direct (machine operators) and indirect (supervisors).
- Inputs: hourly rate, overtime rate, type.
- For each batch, staff/manager logs hours worked.
- System calculates **total labor cost** automatically.
- Labor list can be filtered by type or name.

6. Machine & Utility Costs (FR21–FR24)
- Machines are added with name, hourly cost, and maintenance rate.
- During batch creation, the manager inputs machine hours used.
- Utility costs (electricity, water, etc.) are added for the batch.
- System auto-calculates **total machine + utility costs**.

7. Overheads (FR25–FR27)
- Admin/Manager defines overheads (e.g., factory rent, insurance).
- Overheads can be fixed amounts or percentages of batch cost.
- The system applies overheads automatically and tracks totals monthly/annually.

8. Wastage & Scrap (FR28–FR30)
- During batch setup, the manager enters wastage % for each raw material.
- System automatically adjusts material cost.
- If scrap has resale value, user inputs resale rate, reducing net batch cost.

9. Packaging & Transportation (FR31–FR33)
- For each product/batch, the user inputs packaging cost (per unit or per batch).
- Transportation or logistics cost is also entered.
- Both are added automatically to total batch cost.

10. Profit Margin & Pricing (FR34–FR36)
- Once total cost is ready, user applies a profit margin (fixed or percentage).
- The system calculates **suggested selling price per unit**.
- Dashboard shows profit per unit and profit per batch.

11. Batch Management (FR37–FR40)
- Production Manager creates a **Batch Record**.
- They assign product, raw materials, labor, machines, utilities, packaging, transportation, and overheads.
- System automatically computes:
    - **Total Batch Cost**
    - **Unit Cost**
    - **Break-even Quantity**
- Batches can be edited or deleted.
- Search/filter allows finding batches by date, product, or cost range.

12. Reports & Dashboards (FR41–FR45)
- Manager and Accountant access **Reports**:
    - Cost breakdown pie charts (Material %, Labor %, Overhead %).
    - Batch-wise, monthly, yearly comparisons with trend lines.
- Reports are exportable to **PDF/Excel** with formatting (FR43, FR60).
- Dashboards show KPIs: total cost, cost per unit, profit margins, break-even points.
- Drill-down charts allow clicking from yearly → monthly → batch level.

13. Scenario Simulation (FR46–FR48)
- Manager creates a **What-if Scenario** (e.g., raw material cost +10%).
- System recalculates total and unit costs dynamically.
- Multiple scenarios can be compared side by side in tables/charts.

14. History & Database (FR49–FR51)
- Every batch calculation is saved with timestamp.
- Users can load past records for review.
- System supports **versioning** – if a batch is recalculated, previous version is retained for audit.
- Users can compare multiple batches/products historically.

15. Global Search & Filters (FR52–FR53)
- Global search bar allows searching across:
  - Products, Batches, Raw Materials, Vendors.
- Advanced filters: by date, cost range, vendor, labor type, or batch size.

16. Notifications & Alerts (FR54–FR55)
- Real-time notifications appear in the dashboard:
  - Raw material stock low.
  - Batch cost exceeds budget/threshold.
- Alerts also sent via email (optional future add-on).

17. Security & Compliance (FR56–FR59)
- Every module enforces **role-based permissions**.
- Sensitive financial data is encrypted in storage.
- JWT ensures secure session management.
- An **audit trail** logs all CRUD actions (who changed what and when).

18. Export & Integration (FR60–FR61)
- Any batch report can be exported to **PDF or Excel** (with breakdown, charts, totals).
- Future-ready integration endpoints (REST APIs) are provided for ERP/inventory systems.

End-to-End Flow (How It Feels in Practice)
1. **Admin logs in** → creates users and sets roles.
2. **Manager sets up products, raw materials, vendors, machines, labor, and overheads**.
3. **Staff enters daily data**: hours worked, machine usage, materials consumed.
4. **Manager creates a batch** with all components.
5. System calculates **total and unit cost** instantly.
6. Manager applies **profit margin** → selling price suggested.
7. **Accountant reviews reports** → compares across batches/months.
8. **Scenarios are tested** (material cost fluctuations).
9. Alerts notify of low stock or budget issues.
10. All data is securely saved, versioned, and exportable.