Assignment 1 — Dairy Manufacturing & Distribution Platform

A. Business Requirements Document (BRD)

1) Executive Summary

A national dairy producer with multiple plants and warehouses needs a unified system to (1) manage inventory across raw materials, WIP, and finished goods and (2) provide the quickest delivery to B2B (distributors, modern trade) and B2C (own app/marketplaces) customers with cold-chain constraints.

2) Goals & KPIs

- G1: Real-time inventory accuracy ≥ 98% across locations
- G2: Stockout rate < 2% for top 100 SKUs
- G3: OTIF (On-Time, In-Full) ≥ 95%
- G4: Average delivery time ↓ 25% (baseline to be established)
- G5: Shrinkage/Wastage ↓ 30% (cold-chain losses, expiry)

3) In Scope

- Multi-site inventory (plants, DCs, dark stores, vans)
- Batch/lot, expiry and temperature tracking
- Demand capture (orders from D2C app, call center, portals, EDI)
- Allocation & route optimization (multi-drop, time windows, cold-chain)
- Replenishment planning (min/max, reorder point, FEFO)
- Production consumption & back-flush (WIP → FG)
- Returns/RTO & reverse logistics
- Role-based dashboards & alerts
- Core integrations (ERP/Accounting, e-commerce, TMS/Maps, IoT sensors)

Out of Scope (Phase-1): Dynamic pricing, loyalty engine, advanced S&OP, internationalization, drone delivery.

4) Stakeholders

- COO (Sponsor), Head of Supply Chain, Plant Managers, Warehouse Managers, Transport Manager, Sales Ops, Customer Care, IT/InfoSec, Finance.

5) Assumptions & Constraints

- Cold-chain compliance (2–8°C for dairy; -18°C for ice-cream)
- FEFO required for all dispatches
- Trucks with GPS; optional temperature IoT gateways
- Peak loads during summer/festivals
- SLA windows differ by channel (Horeca vs D2C)

6) High-Level Business Requirements (selected)

- BR-01 Real-time stock by SKU, batch, expiry, location, and temperature band.
- BR-02 FEFO auto-allocation; manual override with reason codes.
- BR-03 Multi-channel order capture; dedupe and validation (credit, geofence, cut-off times).
- BR-04 Route planning with time windows, capacity, temperature constraints, traffic ETA.
- BR-05 Van stock management & ePOD (OTP/signature/photo), returns logging.
- BR-06 Production issue/receipt posting aligned to BOM & yields.
- BR-07 Replenishment proposals per DC by sales velocity, seasonality, safety stock.
- BR-08 Exception alerts (low stock, temperature breach, ageing/near-expiry).
- BR-09 Audit trails, maker-checker for adjustments.
- BR-10 API layer for ERP (GL postings), e-commerce, TMS, IoT.

7) Success Metrics

- Inventory accuracy ≥ 98%, shrinkage ≤ target, OTIF ≥ 95%, average delivery time ↓ 25%, near-expiry write-off ↓ 30%.

8) Risks & Mitigations

- Data quality → cleanse + dual-run;
- Change resistance → role-based training, super-users;
- IoT reliability → buffered logging + alerting;
- Seasonal spikes → autoscaling infra + capacity planning.

9) Reporting & Dashboards

- Control tower: OTIF, ATP by region, ageing heatmap, temperature breaches, route KPIs, pick/pack productivity, wastage.

B. Development & Resource Plan

1) Delivery Approach

- Agile (Scrum) — 2-week sprints; CI/CD; feature flags.
- Environments: Dev → QA → UAT → Prod; blue/green releases.

2) Phases & Timeline (indicative 24 weeks)

1. Discovery & Design (4 wks): workshops, AS-IS/TO-BE, NFRs, integration specs.
2. Foundations (2 wks): cloud, IAM, environments, pipelines.
3. Core Inventory + Inbound (6 wks): items/batches/FEFO, receipts, moves, cycle counts.
4. Order & Allocation (4 wks): multi-channel capture, ATP, FEFO allocation.
5. Routing & Delivery (4 wks): optimizer, driver app, ePOD, van stock.
6. Integrations & IoT (2 wks): ERP, e-comm, maps/TMS, temp sensors.
7. Reporting & UAT (2 wks): dashboards, performance, security, UAT.
8. Go-Live & Hypercare (2 wks).

3) Team & Effort (FTE)

- Product/BA: 1 Lead BA, 1 BA
- Engineering: 1 Architect, 3 Backend, 2 Frontend, 1 Mobile, 1 DevOps, 1 Data/BI
- QA: 2 QA (functional + automation)
- Design: 1 UX
- SM/PM: 1
- Change/Training: 1 enablement lead

4) Tech Stack (suggested)

- Backend: Node.js/Java + REST/GraphQL
- DB: PostgreSQL (OLTP), Redis (caching)

- Queue: Kafka/RabbitMQ
- Optimization: OR-Tools/OptaPlanner
- Mobile (Drivers): Flutter/React Native
- Maps/ETA: Google Maps/OSM provider
- IoT: MQTT gateway + device twin
- BI: Power BI
- Cloud: AWS/Azure (managed Postgres, container services)

5) Non-Functional Requirements

- Availability 99.9%, p95 API < 300ms, scale to peak +50%, PII encryption, SOC2-aligned logging.

6) RACI (snippet)

- Process design: BA (R), Sponsor (A), Ops (C), Eng (I)
- Architecture: Architect (R), PM (A), SecOps (C), BA (I)
- UAT sign-off: Sponsor (A), Ops Managers (R), BA (C)

7) Training & Change

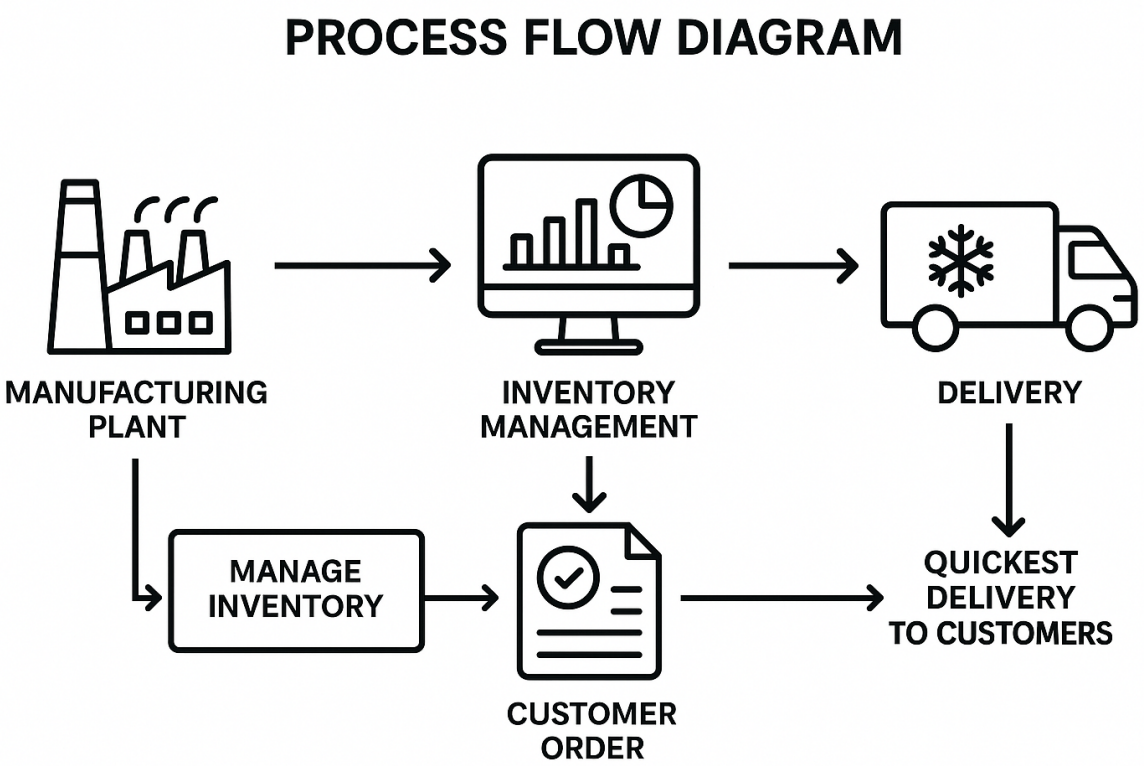
- Role-based guides, train-the-trainer, sandbox practice, helpdesk SOPs.

8) ROM Budget (illustrative)

- Team (6 months), infra, licenses, contingency 15%. (Can be tailored to your rates.)

C. Process Flow Diagram (high level)

Assignment 2



A. Introduction Letter (Business Analyst → Client)

Subject: Kick-off: Business Understanding for Dairy Inventory & Delivery Platform

Dear ,

I'm , the Business Analyst assigned to lead discovery and collaborate with your operations, supply chain, and IT teams. My role is to translate your business goals—accurate inventory and fastest delivery—into clear, testable requirements and an implementation plan.

Over the next few weeks, I will:

- Map AS-IS processes at plants, warehouses, and last-mile operations
- Align TO-BE workflows and success metrics (shrinkage, delivery time)
- Define data, integrations (ERP, e-commerce, TMS, IoT), and compliance requirements
- Facilitate workshops and share prototypes for feedback

Proposed first steps:

1. 90-min kick-off (scope, milestones)
2. Plant/DC walkthrough (virtual or onsite)
3. Data & integration deep-dive (SKU/batch/expiry, orders, routes)

Please share stakeholder contacts and any existing SOPs, reports, and integration docs. Looking forward to partnering with you.

Best regards,

| Business Analyst

<Phone/Email>

B. Brief BRD & SRS — Ticketing System (Support/ITSM)

BRD (Brief)

- Objective: Centralize customer/IT support with SLAs, assignments, and analytics.
- Scope: Ticket creation (portal/email/API), triage, auto-assignment, SLA timers, status lifecycle, comments, attachments, knowledge base link, CSAT survey, reports.
- KPIs: First Response Time (FRT), Resolution Time, SLA breach rate, Reopen rate, CSAT/NPS, backlog age.
- Risks: Low adoption → targeted training; vague categories → taxonomy workshop.

SRS (Brief)

Functional Requirements

- FR-01 Create ticket (user portal, email parser, API); capture requester, category, priority, impact, description, attachments.
- FR-02 Assignment engine: skill/queue-based; round-robin fallback.
- FR-03 SLA engine: start/stop/pause on statuses; holidays & business hours calendars.
- FR-04 Status lifecycle: New → In-Progress → Pending-Customer → Resolved → Closed; Reopen permitted.
- FR-05 Collaboration: comments (internal/external), @mentions, file attachments, tags.
- FR-06 Knowledge suggestions on creation and during triage.

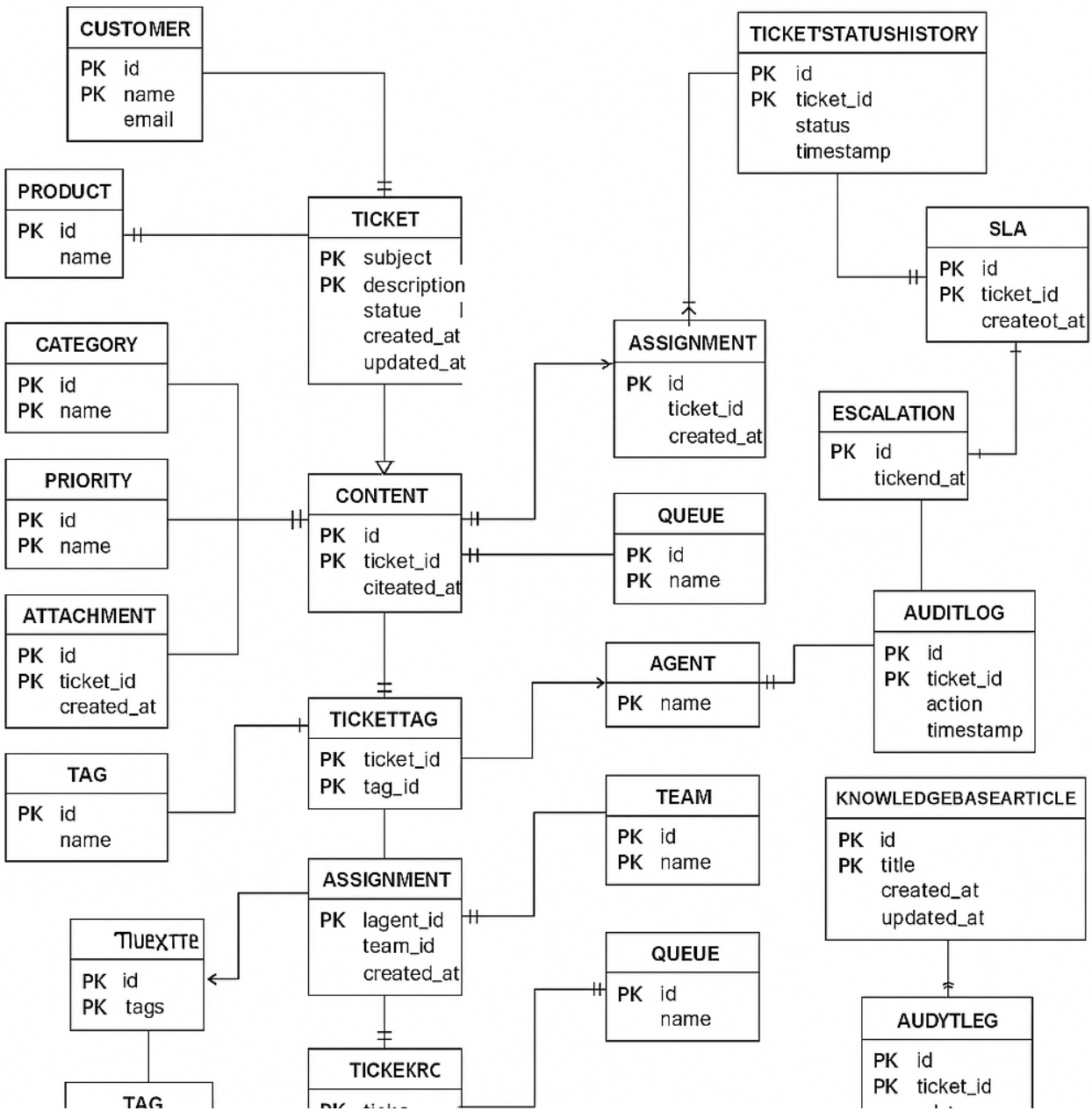
- FR-07 Notifications: email/SMS/push on key events.
- FR-08 Audit log for all changes.
- FR-09 Reports & dashboards; export to CSV.
- FR-10 RBAC: Admin, Agent, Supervisor, Requester.

Non-Functional Requirements

- Availability 99.9%, p95 API < 300ms, SSO (SAML/OAuth2), GDPR/PII controls, OWASP Top-10 mitigations, data retention rules.

Interfaces

- Email (IMAP/API), HRIS/CRM for user sync, webhook for CSAT tools, BI for analytics.



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D. User Stories — Shopping on an E-commerce Site

Epic: Place Order for Ice-Cream & Dairy

- As a customer, I want to discover products, add to cart, pay securely, and receive timely delivery, so that I get fresh products conveniently.

Story 1: Browse & Search

As a customer I want to search/filter by category, price, dietary tags (sugar-free) so that I find the right products.

Acceptance Criteria

- Given I enter a query, when results load, then I see relevant products with images, price, stock & rating.
- Filters by category/price/dietary are combinable and persist on pagination.

Story 2: Product Detail & Availability

As a customer I want to view product details (ingredients, allergens, shelf life) and see delivery slot availability.

AC

- FEFO batch determines available slots by my pincode; out-of-stock shows “Notify me”.

Story 3: Cart & Substitutions

As a customer I want to add items to cart and select substitution preferences.

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- Cart recalculates totals, taxes, and cold-chain delivery fee; suggests substitutions for OOS items.

Story 4: Address & Slot Selection

As a customer I want to save addresses and choose a delivery slot.

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- Slots respect cut-off times and route capacity; blocked slots cannot be selected.

Story 5: Payment

As a customer I want multiple payment options (UPI, cards, COD).

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- Successful payment creates an order and sends confirmation; failed payment keeps cart for 24h.

Story 6: Order Tracking

As a customer I want live order status and driver ETA.

AC

- Tracking page shows packed/out-for-delivery with map ETA; temperature compliance badge on delivery.

Story 7: Returns/Refund

As a customer I want to raise issues (melted, damaged, missing).

AC

- Return request creates a ticket linked to the order; refund or replacement workflow triggers.

Story 8: Admin Inventory

As an ops manager I want to view stock by batch/expiry and push near-expiry promotions.

AC

- Items within X days of expiry appear in “Act Now” list with bulk markdown action.