ER Diagram — Joshi Dairy Farm Management System

======================== ENTITIES & ATTRIBUTES ========================

COMPANY (company\_id PK)

- name

- owner\_name

- location

- production\_rate

- earning

- worker\_count

- area\_sq\_m

USER (user\_id PK)

- company\_id FK → COMPANY

- name

- role {Owner, Manager, Vet, Staff}

- location

- earning

- cows\_count

-company name

ANIMAL (animal\_id PK)

- company\_id FK → COMPANY

- user\_id FK → USER

- tag\_no (unique identifier)

- breed

- dob

- weight

- height

- health\_status

- milk\_capacity

- cycle\_status

- age

MILK\_LOG (milk\_id PK)

- animal\_id FK → ANIMAL

- company\_id FK → COMPANY

- date

- shift {Morning, Evening}

- quantity\_liters

- fat\_percent

- snf\_percent

- recorded\_by (FK → USER)

FEED (feed\_id PK)

- company\_id FK → COMPANY

- animal\_id FK → ANIMAL

- date

- feed\_type

- quantity

- cost

HEALTH\_RECORD (health\_id PK)

- animal\_id FK → ANIMAL

- company\_id FK → COMPANY

- checkup\_date

- symptoms

- medication

- vet\_id FK → USER

- vaccination\_date

- next\_due\_date

BREEDING (breeding\_id PK)

- animal\_id FK → ANIMAL

- company\_id FK → COMPANY

- heat\_cycle\_date

- insemination\_date

- pregnancy\_check\_date

- calving\_date

- status

INVENTORY (inventory\_id PK)

- company\_id FK → COMPANY

- item\_name

- category {Feed, Medicine, Equipment}

- quantity

- threshold

- cost\_per\_unit

FINANCE (finance\_id PK)

- company\_id FK → COMPANY

- type {Income, Expense}

- amount

- description

- date

CUSTOMER\_VENDOR (cv\_id PK)

- company\_id FK → COMPANY

- name

- type {Customer, Vendor}

- location

- contact

- milk\_quantity

- payment\_amount

- payment\_status

- payment\_date

WORKER (worker\_id PK)

- company\_id FK → COMPANY

- name

- age

- location

- salary

- work\_hours

- leaves

- role

ATTENDANCE (attendance\_id PK)

- worker\_id FK → WORKER

- date

- status {Present, Absent, Leave}

- work\_hours

NOTIFICATION (notif\_id PK)

- company\_id FK → COMPANY

- user\_id FK → USER

- type {Vaccine, Payment, Breeding, Inventory}

- message

- due\_date

- status {Pending, Sent}

CHATBOT\_LOG (chat\_id PK)

- user\_id FK → USER

- company\_id FK → COMPANY

- query

- response

- timestamp

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======================== RELATIONSHIPS ========================

COMPANY 1 --- N USER

COMPANY 1 --- N ANIMAL

COMPANY 1 --- N WORKER

COMPANY 1 --- N INVENTORY

COMPANY 1 --- N FINANCE

COMPANY 1 --- N CUSTOMER\_VENDOR

COMPANY 1 --- N NOTIFICATION

USER 1 --- N MILK\_LOG

USER 1 --- N CHATBOT\_LOG

USER (Vet) 1 --- N HEALTH\_RECORD

ANIMAL 1 --- N MILK\_LOG

ANIMAL 1 --- N FEED

ANIMAL 1 --- N HEALTH\_RECORD

ANIMAL 1 --- N BREEDING

WORKER 1 --- N ATTENDANCE

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**🏗 Microservices (Joshi Dairy Farm)**

1. **API Gateway Service**
   * Entry point for all requests
   * Routes requests to appropriate microservices
   * Handles load balancing & authentication token forwarding
2. **Authentication Service**
   * User login, registration, JWT issuing
   * Role-based access control (Owner, Vet, Worker, Manager)
3. **Company Service**
   * Company management (add company, details, revenue, profit)
4. **User Service**
   * Manage users linked to companies (owner, manager, workers, staff, etc.)
5. **Animal Service**
   * Manage cows (health, production, breeding cycle)
6. **Milk Service**
   * Manage milk logs (production, fat %, SNF %, daily reports, graphs)
7. **Health Service**
   * Veterinary records (vaccination, checkups, medication)
8. **Breeding Service**
   * Cow cycle, insemination, calving records
9. **Feed & Inventory Service**
   * Feed records, medicine stock, equipment, threshold alerts
10. **Finance Service**
    * Revenue, expenses, profit/loss, payments tracking
11. **Customer & Vendor Service**
    * Milk distributors, vendors, payments
12. **Worker Service**
    * Worker records, attendance, salary, leaves
13. **Notification Service**
    * Notifications (breeding alerts, payment reminders, vaccinations)
14. **Chatbot Service**
    * AI-driven chatbot for support and profit advice
15. **Config Server (Spring Cloud Config)**
    * Centralized configuration for all microservices
16. **Service Discovery (Eureka Server)**
    * Service registration & discovery
17. **Monitoring & Logging Service (Optional)**
    * Metrics, logs, distributed tracing (Zipkin/Prometheus/Grafana)