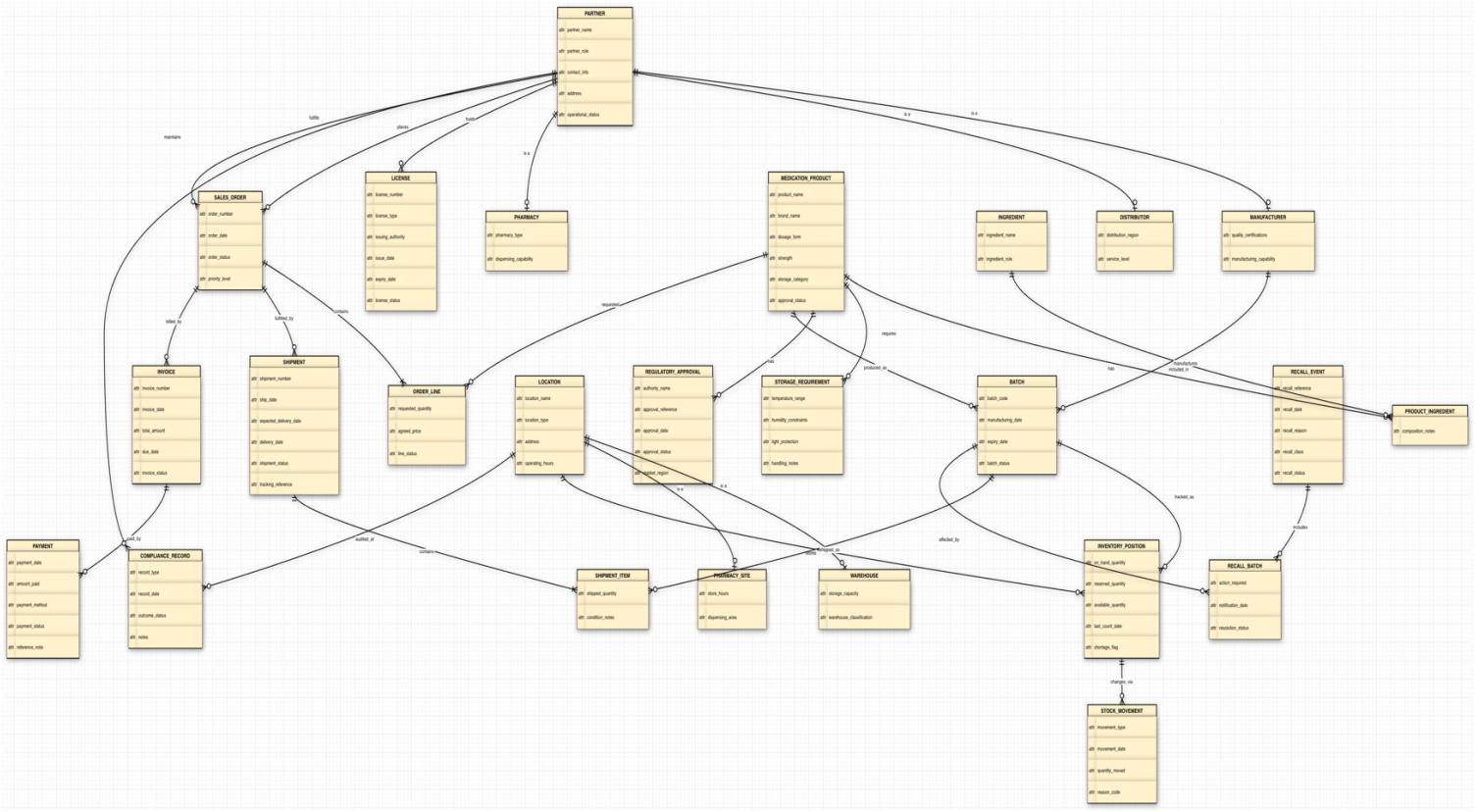
P2 – DATABASE DESIGN AND CONCEPTUAL ERD

GROUP 4 –

1. CONCEPTUAL ERD



2. DATABASE DESIGN –

1. Business Problems Addressed

- Manages multiple supply-chain partners (manufacturers, distributors, pharmacies) and their licenses
- Supports batch-level traceability for expiration tracking, quality control, and recalls
- Provides visibility into inventory levels across warehouses and pharmacy sites
- Enables accurate order, shipment, invoice, and payment tracking
- Supports regulatory compliance, audits, approvals, and recall management

2. Key Entities and Relationships

A. Partner and Licensing

- Partner (supertype)
  - Subtypes: Manufacturer, Distributor, Pharmacy
- License
  - One partner can hold multiple licenses

B. Product and Regulatory

- Medication_Product
- Ingredient
- Product_Ingredient (associative entity)
- Storage_Requirement
- Regulatory_Approval

C. Batch, Location, and Inventory

- Batch (production-level tracking)
- Location (supertype)
  - Subtypes: Warehouse, Pharmacy_Site
- Inventory_Position (current stock per batch/location)
- Stock_Movement (inventory history)

D. Orders, Shipments, and Finance

- Sales_Order
- Order_Line
- Shipment
- Shipment_Item
- Invoice
- Payment

E. Compliance and Recall

- Compliance_Record
- Recall_Event
- Recall_Batch

3. Key Design Decisions

- Conceptual model only (no keys, attributes, or data types)
- Supertype–subtype structures reduce duplication and improve clarity
- Batch-level design ensures full traceability and recall support
- Inventory split into current state and historical movements
- Separate order, shipment, invoice, and payment entities support real-world workflows
- Dedicated compliance and recall entities emphasize regulatory requirements