# Business Problems

## 1. Business Problem: Inventory Inaccuracy and Stock Mismanagement

Businesses often face discrepancies between recorded inventory and actual stock, leading to overselling, out-of-stock issues, and unnecessary storage costs. This undermines order fulfillment, customer satisfaction, and operational efficiency. The problem is compounded when inventory isn't updated in real-time across sales, returns, and warehouse operations.

**Solution**:
This system ensures accurate, real-time inventory synchronization by integrating inventory updates from `Order_Items`, `Returns`, and `Warehouse_Orders`. The `Inventory` table tracks stock levels, reorder thresholds, and last restock dates. Automated checks flag low stock conditions, enabling proactive restocking. This reduces lost sales, minimizes carrying costs, and ensures fulfillment reliability.

## 2. Business Problem: Lack of Insight into Discount and Promotion Effectiveness

Promotions often run without visibility into their impact, leading to margin erosion without increased sales volume. Businesses don’t know which discounts drive real ROI.

**Solution**:
Discounts are directly applied to products and tracked in the `Discounts` table. Sales data in `Order_Items` can be filtered by discount ID and timestamp to measure effectiveness. The system enables pre-post discount comparisons, allowing targeted, data-backed promotion strategies that maximize ROI while minimizing margin loss.

## 3. Business Problem: High Rate of Returns Without Insight

Frequent returns can erode profitability, especially when businesses lack visibility into return reasons, affected products, or patterns across customers. This prevents targeted action against defective products, fraud, or poor customer experience.

**Solution**:
Returns are tightly integrated with original order items via the `Returns` table. Each return logs the reason, quantity, and status, enabling precise analysis of return behavior across products and customers. Business rules ensure returns never exceed sold quantities. Insights generated can help flag quality issues, improve product descriptions, and optimize return policies.

## 4. Business Problem: Warehouse Inefficiencies and Poor Stock Turnover

Warehouse operations become costly when inventory sits idle or products are overstocked in low-demand locations. Without tracking product movement and storage activity, optimizing warehouse usage is impossible.

**Solution**:
The system ties each inventory record to a warehouse (`Inventory.warehouse_id`), tracking stock levels, last restock dates, and movement history through `Warehouse_Orders`. This enables warehouse-level turnover calculations and identifies slow-moving products. The insights support better warehouse planning, layout optimization, and stock rebalancing across locations.

## 5. Business Problem: Inconsistent or Incomplete Payments

A common issue in order management is mismatched or missing payment records, resulting in revenue leakage, order status errors, and complications during audits or customer disputes. Manual reconciliation wastes time and introduces errors.

**Solution**:
Payments are directly tied to customer orders via `Payments.order_id`, and the system enforces full reconciliation between order totals and payment amounts. Business logic ensures no order is marked as fulfilled unless payment is complete. Payment methods and statuses are tracked, supporting financial reporting, fraud detection, and dispute resolution.

## 6. Business Problem: Lack of Visibility into Product Sales Performance

Without granular visibility into what products are selling, how often, and in which categories, businesses struggle to make informed pricing, stocking, and promotional decisions. Sales trends, customer demand, and product seasonality go unnoticed, resulting in inefficient inventory turnover and missed revenue opportunities.

**Solution**:
The system captures all sales transactions through `Customer_Orders` and `Order_Items`, with products linked to `Categories`. This enables product-level, category-level, and time-based sales analytics. Stakeholders can identify top performers, slow movers, and seasonal trends, allowing data-driven decisions on pricing, stock planning, and marketing investments.