🚚 Supply Chain Optimization & Inventory Forecasting

🎯 Project Overview

Objective: Optimize supply chain processes and improve inventory forecasting using data-driven insights.

Business Problem: Managing stock levels, fulfilling orders on time, and predicting demand are challenging, often causing lost sales or overstock.

Solution Summary: Built an analytical solution using **MySQL**, **Excel**, and **Power BI** to analyze sales, orders, and inventory for actionable insights.

🛠️ Tools & Technologies

- **Database:** MySQL
- **Visualization:** Power BI
- **Language:** SQL
- **Support Tools:** Excel

📊 Dataset Description

Sources: CSV files imported from Excel to MySQL

Main Tables:

- SCO-Sales: Sales records
- SCO-Orders: Order details
- SCO-Inventory: Inventory levels & reorder points
- SCO-Products: Product metadata (category, price)

Key Fields:

- Sale_ID, Date, Product_ID, Units_Sold, Unit_Price, Region

- Order_ID, Order_Quantity, Order_Date, Supplier, Order_Status
- Inventory_ID, Stock_Quantity, Reorder_Level, Safety_Stock, Warehouse_Location

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🧮 SQL Analysis Summary

- Total Orders Placed
- Orders by Month
- Most Ordered Product
- Orders by Status
- Supplier Performance
- Cancelled Orders Summary
- Average Delivery Time
- Daily Order Trends
- Reordered Products
- Recent Pending Orders

🔍 Summary

This project focuses on optimizing supply chain and inventory forecasting using **SQL**, **Excel**, and **Power BI**. It involves analyzing sales, orders, and stock levels to uncover trends, monitor supplier performance, and improve decision-making. Key outputs include interactive dashboards, 10+ SQL queries with business insights, and actionable recommendations to automate restocking, manage demand, and enhance delivery efficiency.

📈 Dashboard #1 – Sales & Orders

KPI Cards (7):

1. Sum of Units Sold
2. Total Revenue
3. Total Units Sold
4. Delivered Orders
5. Cancelled Orders
6. In Transit Orders
7. Pending Orders

Visuals (3):

1. Sales Trend Over Time – Line chart by Year, Month, Day
2. Sales by Region – Column/bar chart by region
3. Order Status Distribution – Donut or stacked column chart

📦 Dashboard #2 – Inventory Overview

KPI Cards (4):

1. Total Inventory Stock
2. Products Below Reorder
3. Pending Orders
4. Total Suppliers

Visuals (3):

1. Inventory Summary – Reorder Point, Safety Stock & Current Stock by Product ID (Clustered bar)
2. Order Status Breakdown – Product ID count by Order Status (Stacked bar)
3. Daily Order Status – Trends of Order Status over days (Line chart)

💡 Insights & Recommendations

- Maintain safety stock for top 5 selling products
- Automate reorders for frequently low-stock items
- Reallocate inventory using regional sales trends

- Analyze delayed deliveries by supplier/region

✅ Conclusion

Data-driven insights helped optimize supply chain and inventory systems. Using SQL, Excel, and Power BI, we improved visibility, forecasting, and decision-making to enhance operational efficiency and reduce business risks.