Inventory Management System

by AICloud Solutions

Problem Statement

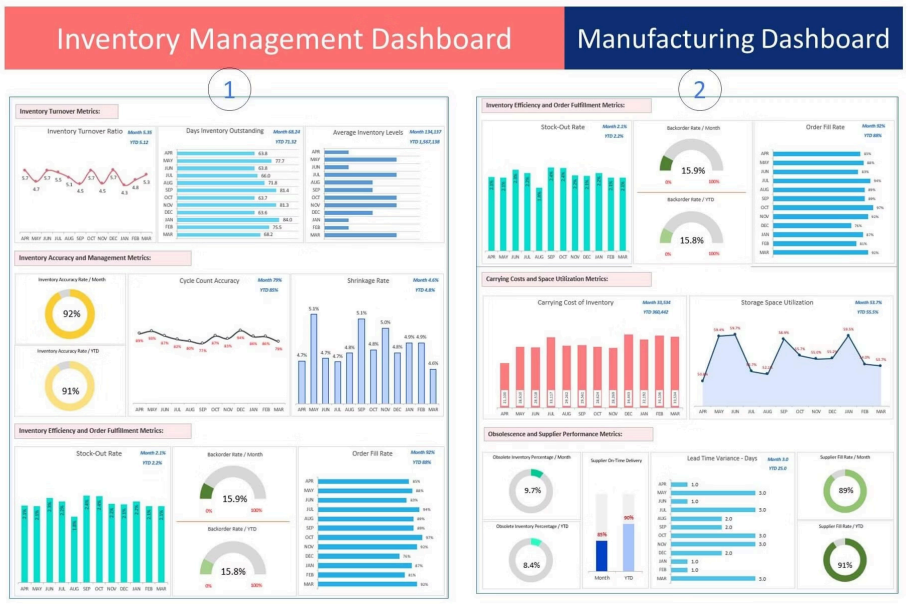
Modern businesses struggle to track, forecast, and optimize inventory operations across growing product lines and warehouses. Existing systems often:

- Fail to provide real-time, actionable analytics
- Lack data integration pipelines for automated refresh
- Provide limited flexibility for segmentation or demand trend analysis

Goal: Build an enterprise-grade, data-centric inventory solution with automation, forecasting, and decision intelligence.

System Architecture

- **Data Generation:** Synthetic inventory data generation using Python scripts
- **Ingestion Layer:** Raw data uploaded into Databricks (CSV-based batch loads)
- **Processing Layer:**
  - Bronze: Raw staging layer
  - Silver: Cleaned and enriched views (fact/dim separation)
  - Gold: Aggregated metrics + joins (ready for reporting)
- **Visualization Layer:** Power BI dashboard (Sales, Stock, Trends, KPIs)

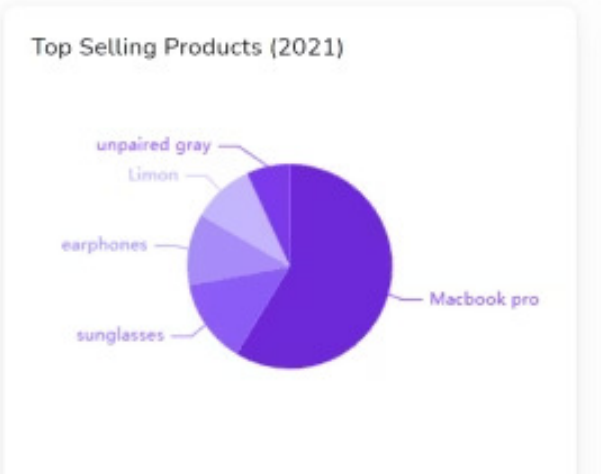


Features & Capabilities

- Modular ETL pipelines (Bronze → Silver → Gold)
- Dimensional modeling (Product, Store, Category, Time)
- Inventory Forecasting (planned integration)
- Drill-down reporting: Category-level, Store-level, SKU-level
- Built-in refresh logic and job orchestration
- Scalability for multi-location inventory warehouses

Power BI Dashboard Highlights

- **Pages:** Inventory Overview, Store-wise Summary, Stock Movement, Product Trends
- **KPI Cards:** Units Sold, Stock Remaining, Daily Turnover, Reorder Risk
- **Visuals:** Time-series line charts, Treemaps for categories, Bar charts by SKU
- **Filters:** Store, Time range, Category, Status
- Consistent formatting for professional reporting



Value to Business

- Improved inventory visibility & stock efficiency
- Proactive replenishment with data-driven alerts
- Support for high-level strategic planning (expansion, pricing)
- Low-code setup with extensibility for ML/forecasting
- Stakeholder-ready dashboards with real-time metrics

Resources

[Github URLG]

ChatGPT Problem Solving Prompts