



Executive Summary

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This project analyzes retail sales, inventory, and supplier data to evaluate **inventory health, demand patterns, and replenishment risks** across products and stores.

The analysis reveals that while the current inventory position is **stable with no immediate stockout risks**, demand is **uneven across SKUs, stores, and categories**, creating hidden operational risks. High-demand products, demand volatility, long supplier lead times, and minimum order constraints present opportunities to **optimize replenishment policies, reduce working capital pressure, and improve service levels**.

Overall, the business is operationally healthy today but requires **proactive inventory controls** to remain resilient as demand scales.

Key Business Insights

1 Demand & Sales Dynamics

- Fast-moving SKUs pose **future stockout risk** and require tighter inventory monitoring.
- High revenue does not always correlate with high volume, indicating the presence of **margin-driving SKUs**.
- Demand is **uneven across stores**, with a small group of stores contributing a disproportionate share of revenue.

2 Inventory Health

- There are **no immediate stockouts**, indicating healthy initial inventory planning.
- Inventory levels are generally well-aligned with demand, with no significant overstock issues detected.
- However, uneven demand distribution increases **localized inventory risk** at certain stores.

3 Category-Level Insights

- Categories such as **Beauty, Stationery, and Apparel** require more refined inventory planning.
- **Apparel** shows higher demand volatility and product variety, necessitating higher safety stock compared to Home or Beauty.

4 Supplier & Replenishment Risks

- SKUs with **high demand and long supplier lead times** present elevated stockout risk if demand spikes.
- High supplier **Minimum Order Quantities (MOQ)** can increase working capital pressure, especially for slower-moving SKUs.



Business

Recommendations

1 Inventory Strategy

- Implement **SKU-level inventory prioritization**, focusing on fast-moving and high-variability products.
- Introduce **early-warning indicators** (inventory coverage ratios) instead of waiting for stockouts.
- Apply **category-specific safety stock policies**, particularly for Apparel.

2 Replenishment & Supplier Management

- Prioritize replenishment for SKUs with **long lead times and high demand**.

- Renegotiate supplier contracts with **high MOQ requirements** to improve cash flow flexibility.
- Explore **more frequent, smaller replenishment cycles** for high-demand stores.

Store-Level Optimization

- Align replenishment frequency with **store-level demand intensity**.
 - Allocate inventory dynamically to reduce uneven stock pressure across locations.
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Overall Business Value Delivered

- Identified **future stockout risks before failures occur**
 - Improved **inventory allocation and replenishment prioritization**
 - Reduced potential **working capital lock-in** from supplier constraints
 - Enabled **data-driven inventory policy differentiation by category**
 - Strengthened operational resilience through **proactive risk monitoring**
 - Demonstrated how SQL analytics supports **scalable retail decision-making**
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