

Optimizing Hospital Supply Chain Inventory: Insights into Stock Management and Restocking Efficiency

by-**Abhinav Rawat**

❑ Supply Chain In Hospitals

A hospital's supply chain is a complex network of systems, people, and processes that work together to ensure the timely delivery of medical supplies, equipment, and pharmaceuticals. Its efficient operation is crucial for patient care, staff productivity, and overall hospital performance

❑ Problem Statement

In healthcare settings, maintaining an efficient and reliable supply chain is crucial to ensure that hospitals are always prepared to meet patient needs. However, managing hospital inventory can be complex due to various factors such as fluctuating demand, limited space for storage, and the need to adhere to strict regulations for medical supplies. Mismanagement of hospital supply chains can result in stock outs, overstocking, and increased costs, all of which can negatively impact patient care and hospital operations.

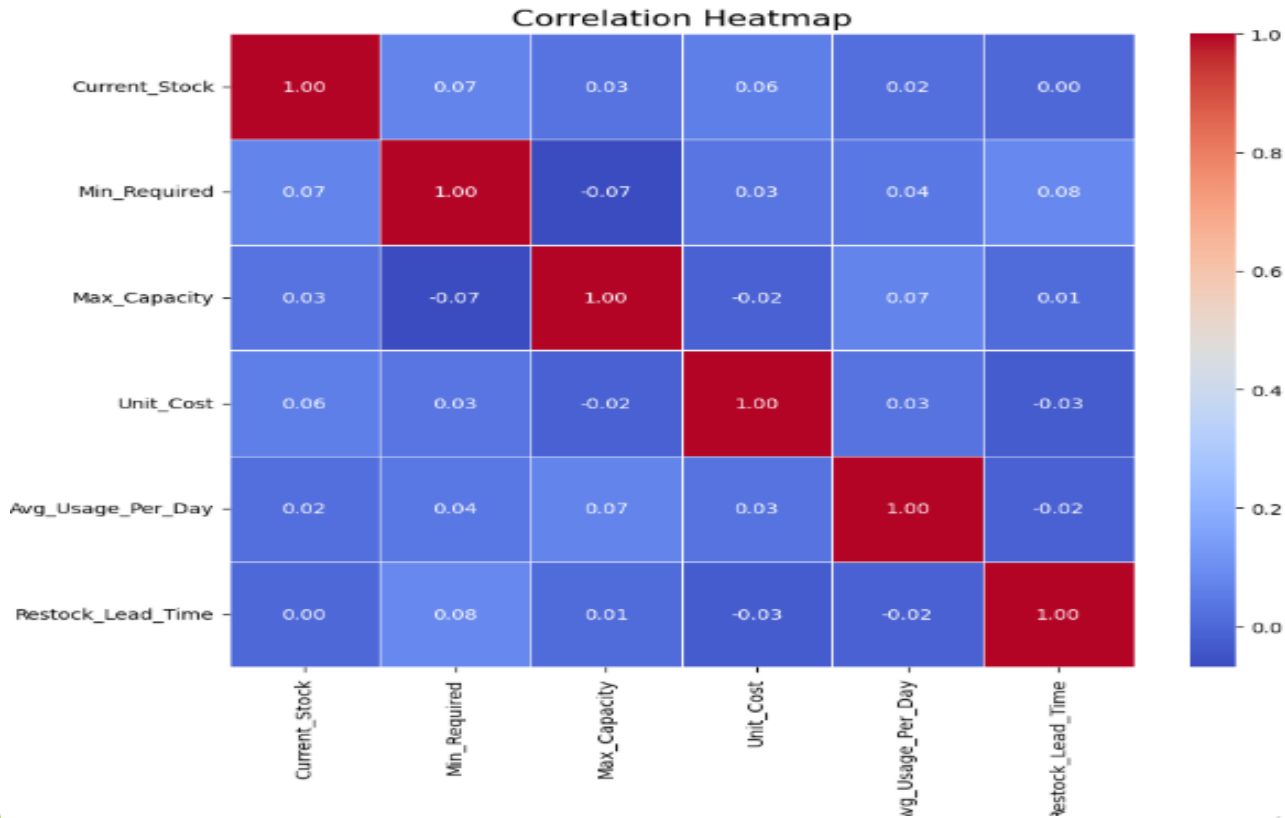
□ Data Summary

The dataset has a shape of (500,11) which means that it contains approximately 500 rows and 11 columns.

The data has the following columns.

- Date
- Item Type
- Item ID
- Item Names
- Vendor ID
- Current Stock
- Min Required
- Max Required
- Avg Usage Per Day
- Restock Lead Time
- Unit Cost

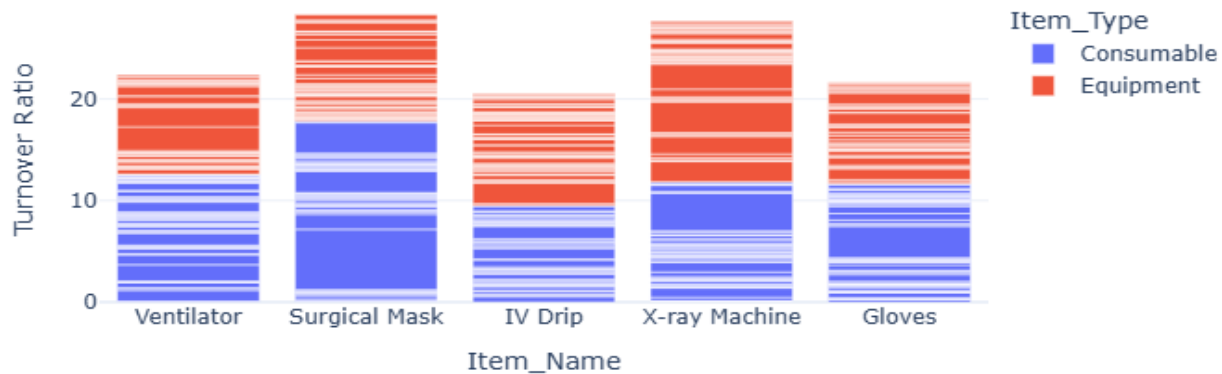
Correlation Matrix



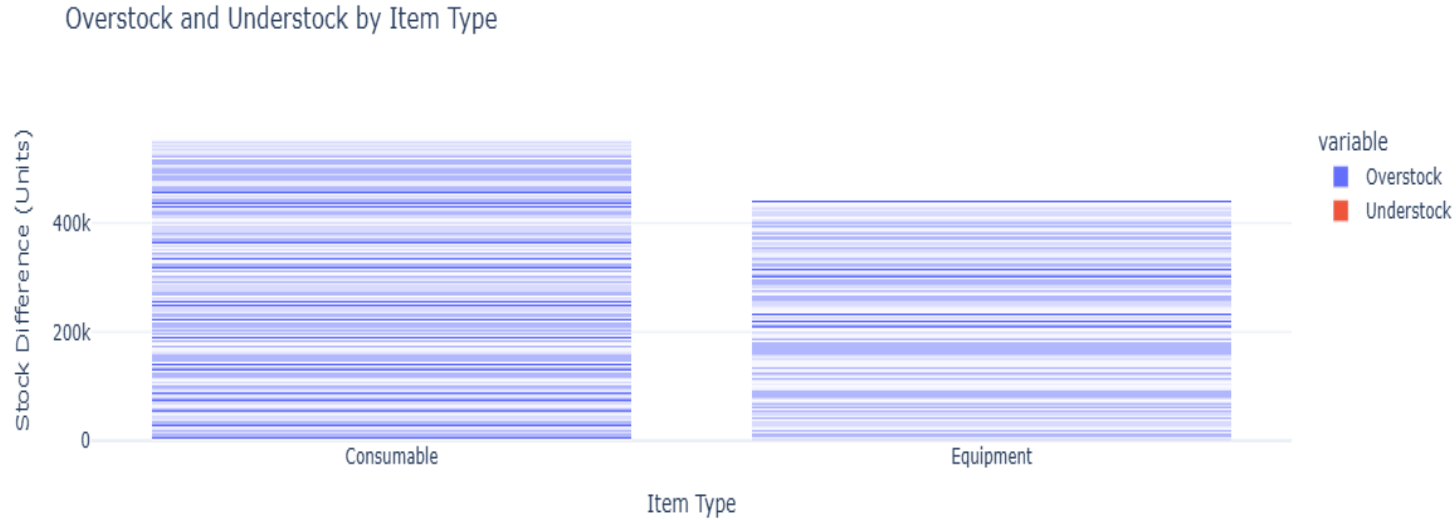
EDA

Inventory Turnover Ratio by Item Type

Inventory Turnover Ratio by Item

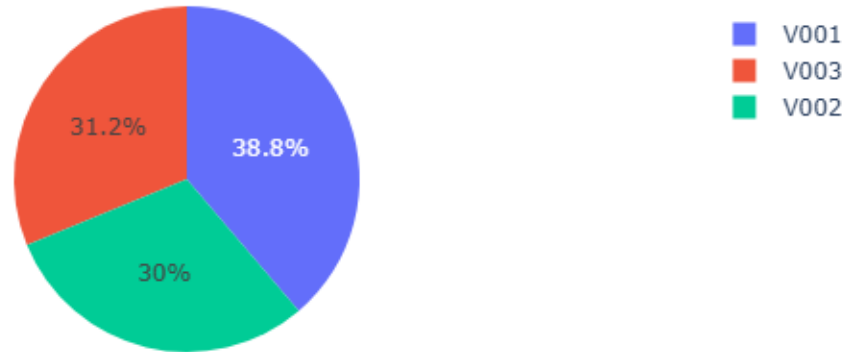


Overstock and Understock by Item Type



Proportion of Total Stock by Vendor

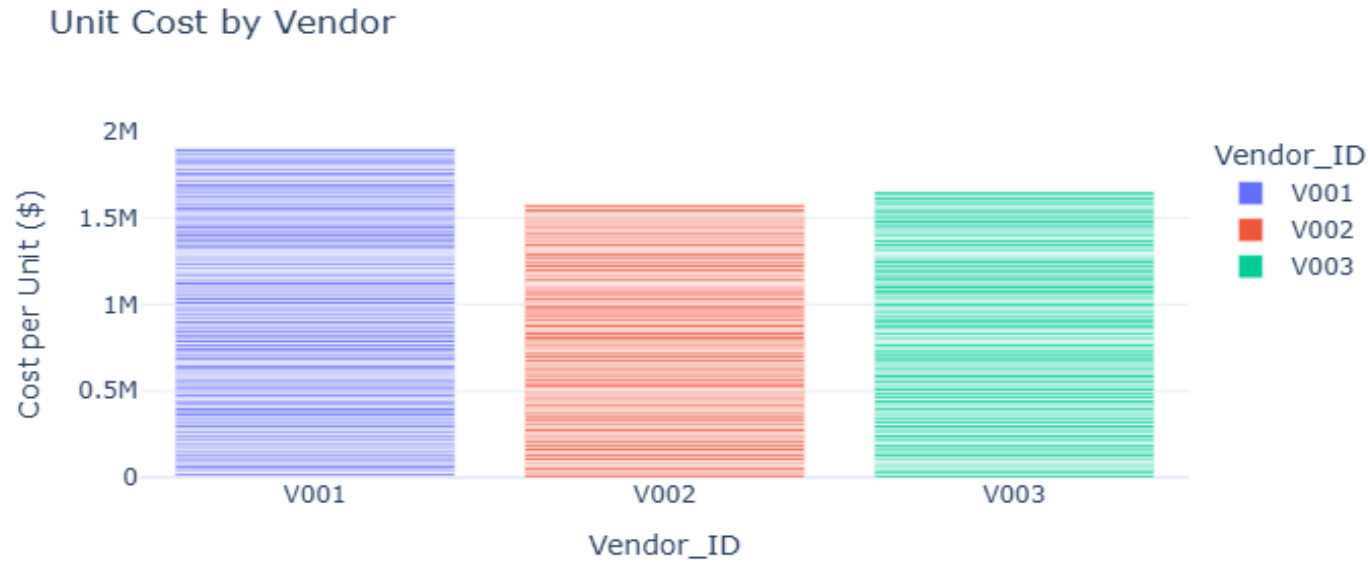
Proportion of Total Stock by Vendor



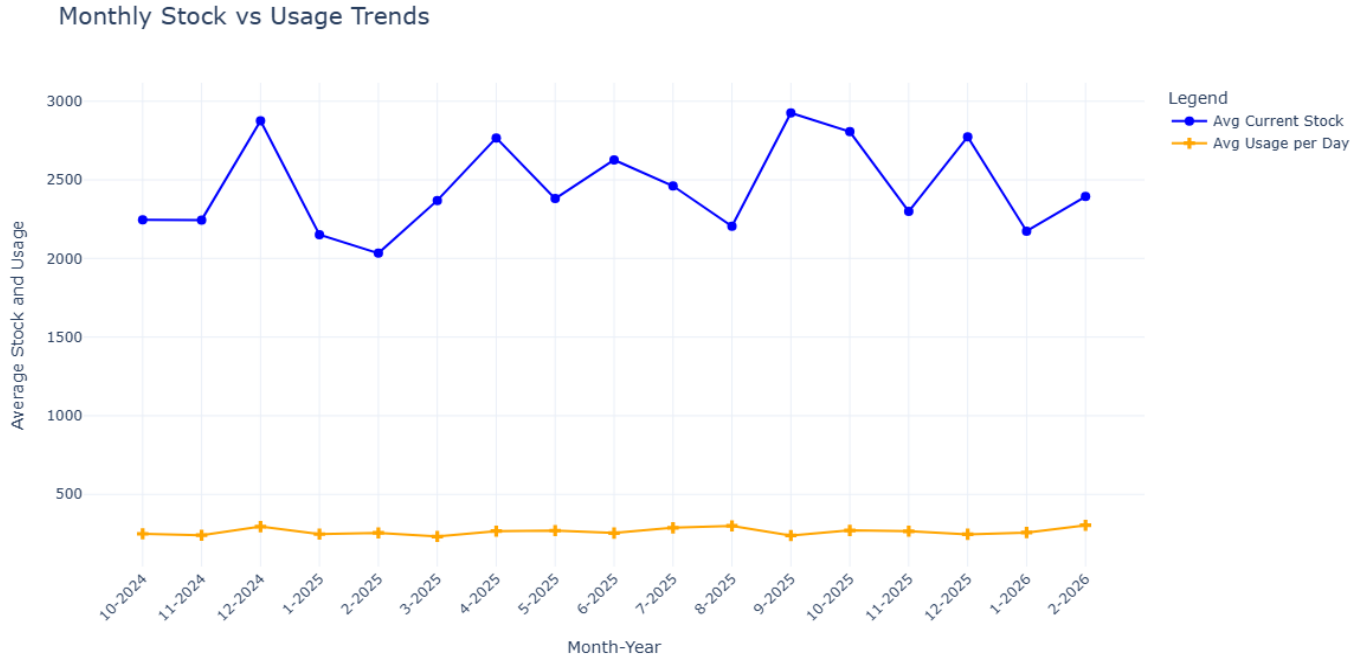
Restock Lead Time by Vendor



Vendor Cost Analysis

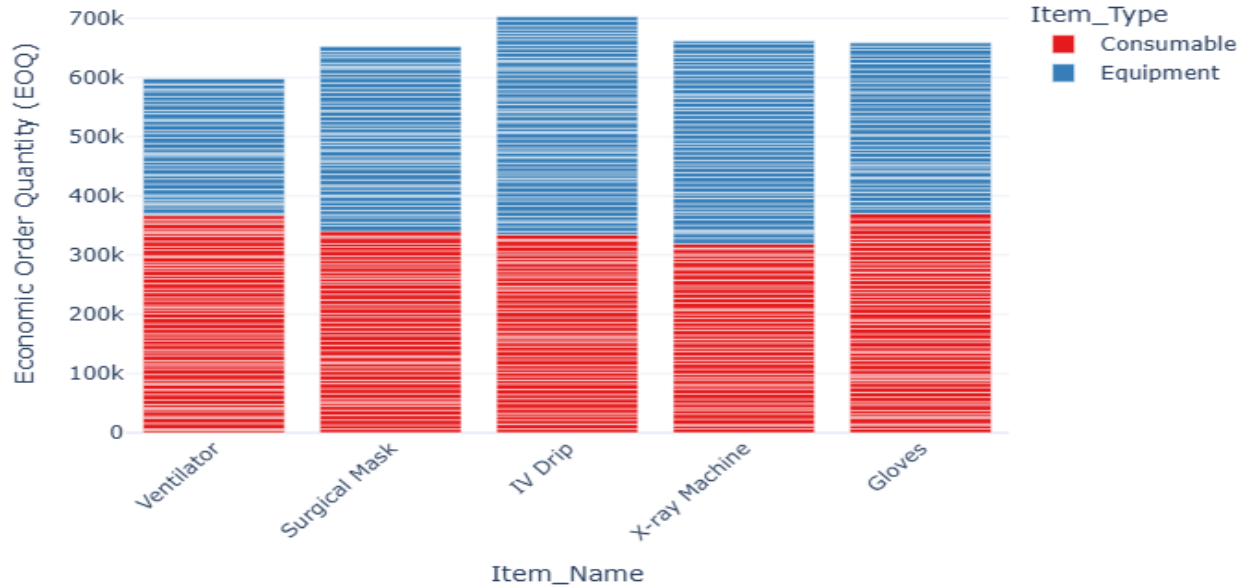


Monthly Stock And Usage Trend

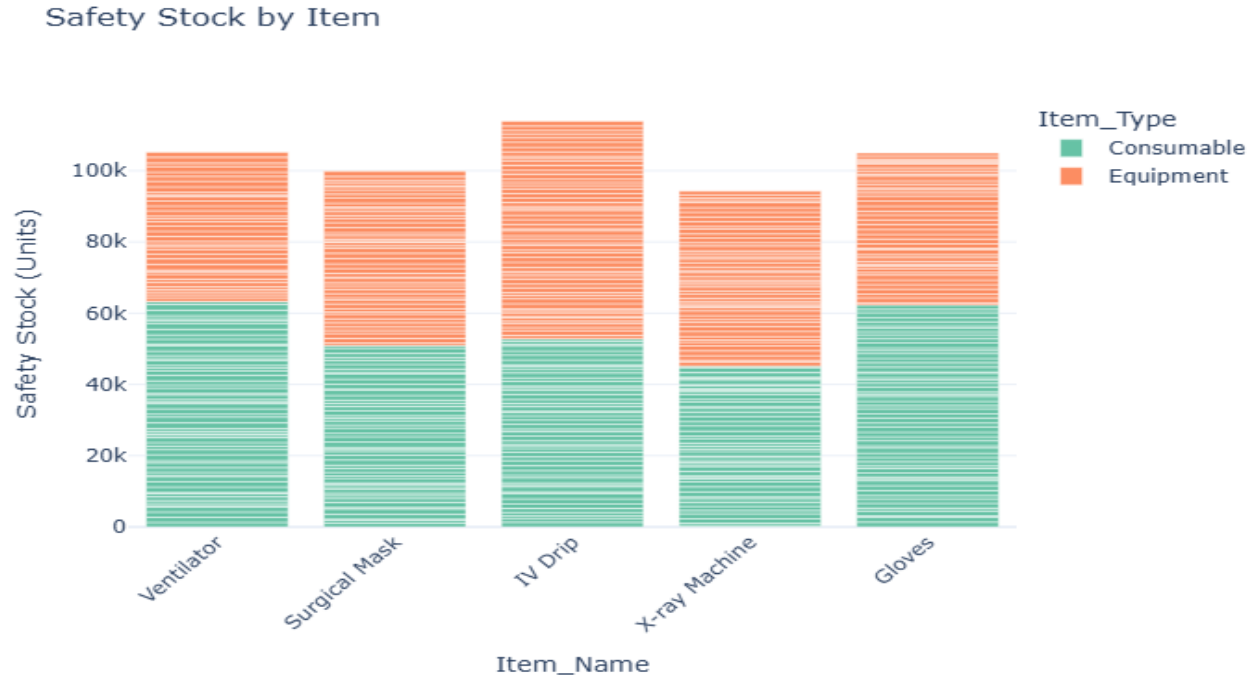


Economic Order Calculation(EOQ)

Economic Order Quantity (EOQ) by Item



Safety Stock Calculation



❑ Conclusions

- *Consumables have high turnover rates and are prone to overstocking, requiring precise management..*
- *Equipment demand is stable, with lower turnover rates.*
- *Vendor V001 accounts for the largest share of inventory but has longer lead times and higher costs, while V002 and V003 offer shorter lead times and cost-efficiency, making them preferable for critical supplies.*
- *Monthly stock fluctuations indicate variability in planning, while daily usage remains consistent.*
- *EOQ and safety stock calculations highlight opportunities to optimize costs and reduce stock out risks.*
- *Strategic inventory management is essential to balance stock availability, cost efficiency, and vendor reliability.*

❑ Recommendation

- **Improve Consumables Management:** Regularly adjust inventory levels based on demand patterns and maintain safety stock to prevent stock outs.
- **Diversify Vendors:** Reduce reliance on Vendor V001 by reallocating critical supplies to other vendors and establishing backup suppliers.
- **Optimize Inventory Costs:** Use EOQ to balance holding and ordering costs and minimize overstocking.
- **Enhance Vendor Contracts:** Negotiate for shorter lead times and reliable performance benchmarks.

The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect. The shapes are concentrated on the right side of the frame, with some extending towards the left.

Thank You