

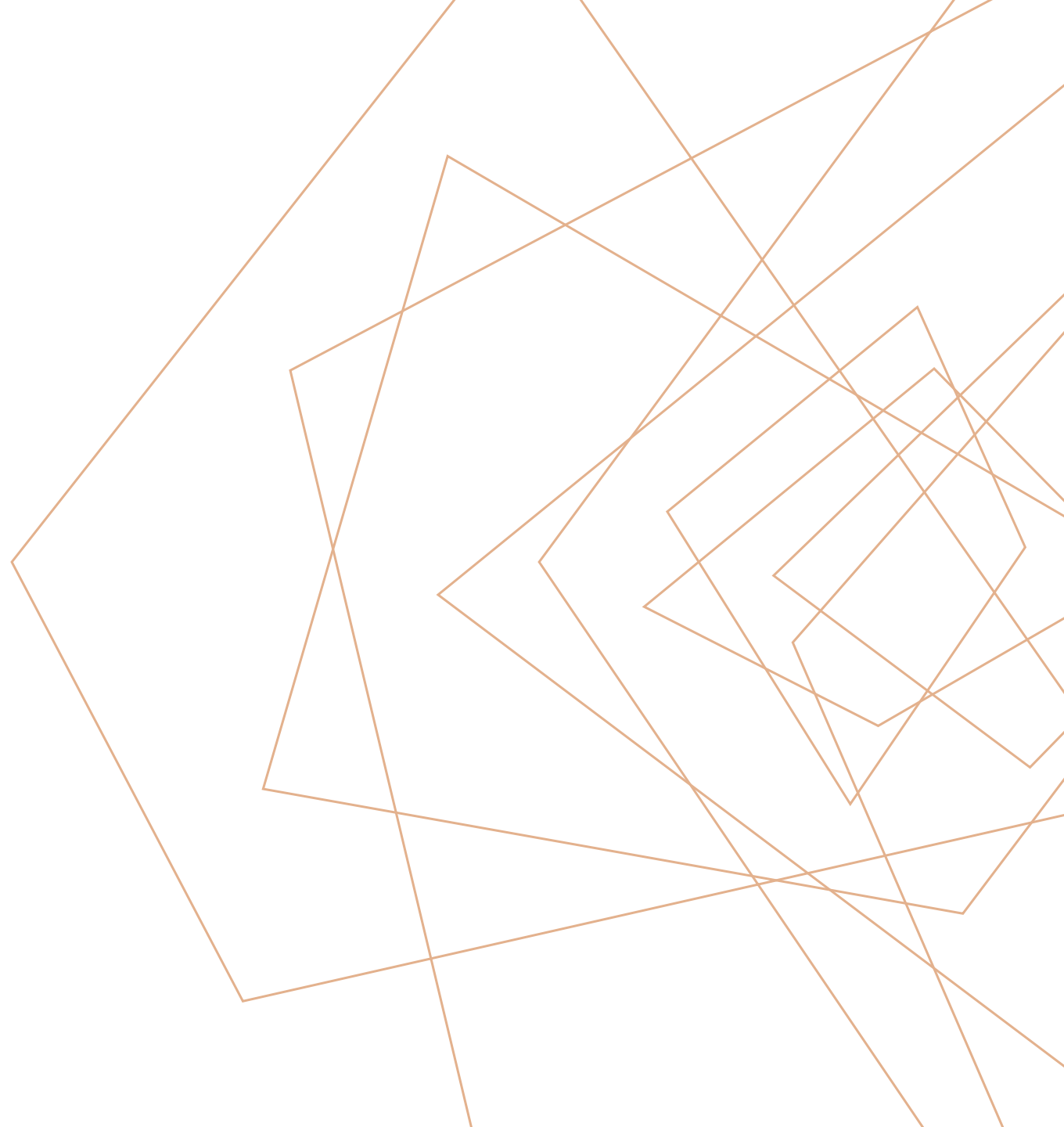
Abstract geometric lines in the top left corner, consisting of several thin, light brown lines that intersect to form various polygons and shapes, creating a modern, minimalist design.

SOLVING INVENTORY INEFFICIENCIES USING ADVANCED SQL ANALYTICS

VIKRANT SINGH [IIT ROORKEE]

INTRODUCTION

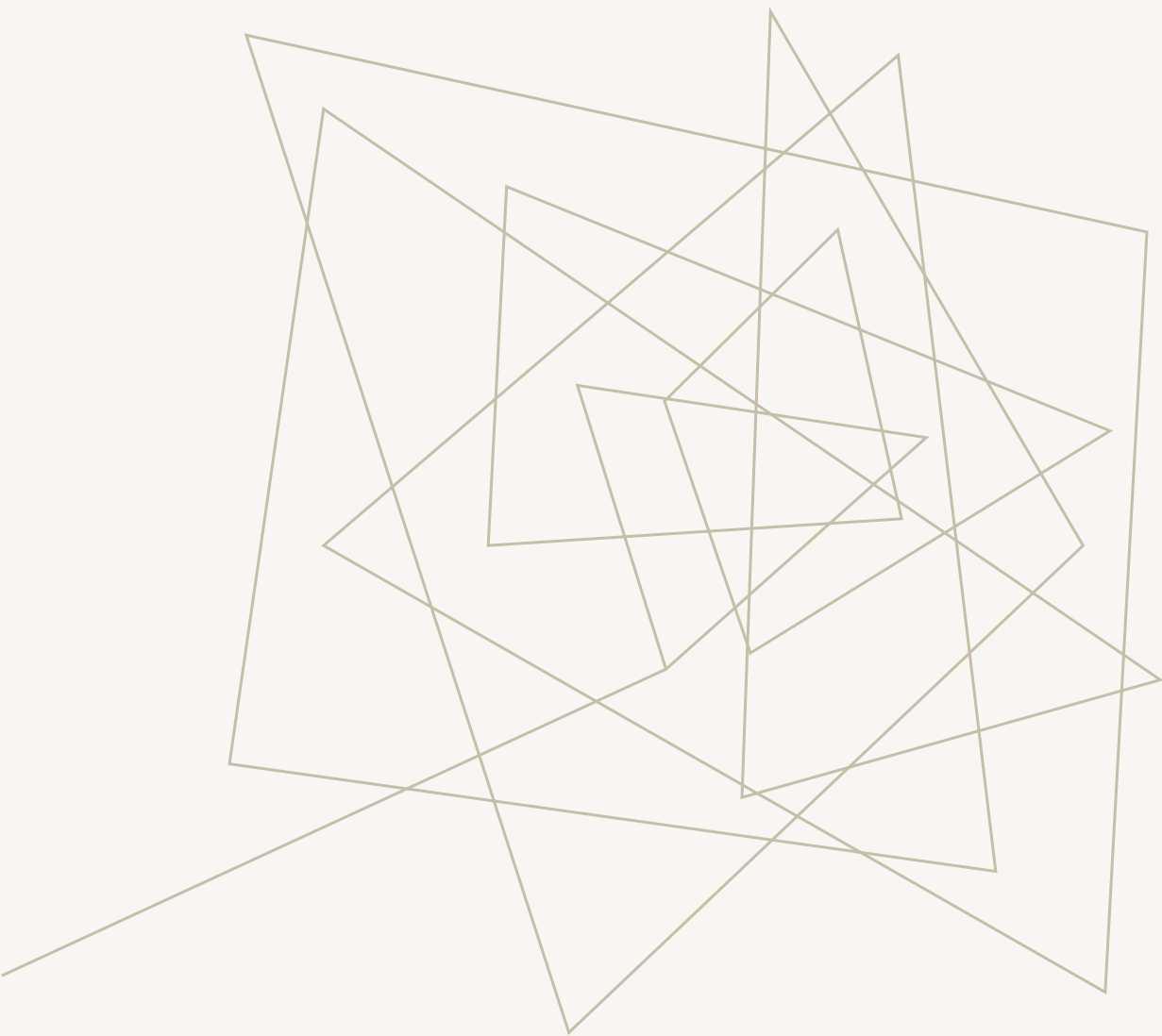
Urban Retail Co. is a growing retail chain with physical stores and online sales across multiple cities. We offer over 5,000 SKUs, including groceries, electronics, and personal care items. Inventory is managed through regional warehouses that supply individual outlets. However, we struggle with maintaining optimal stock levels due to operational complexity. Despite having valuable data, poor utilization results in inventory inefficiencies.





OBJECTIVE

- Create a data-driven inventory monitoring and optimization solution using SQL
- Provide key performance insights such as inventory turnover, stockout and overstock risk, and accuracy in demand forecasting.
- Design a relational schema for improved data management.
- Visualize inventory performance metrics in an easy-to-understand dashboard.



KEY INSIGHTS

FAST-SELLING VS SLOW-MOVING PRODUCTS

- Products such as P0046 (Clothing) and P0096 (Toys) show high forecasted and actual demand, confirming they are fast-selling.
- Products with high average inventory age (>900 days), such as P0096, P0016, P0031, point to slow-moving items. This can lead to higher holding costs and potential obsolescence risk.



STOCK OUT AND OVERSTOCK INSIGHTS

- Several products have stock out rates above 95% (e.g., P0016, P0031, P0171, P0175) across stores. This indicates poor replenishment planning.
- Overstocks remain high (>370 days for many SKUs), which ties up working capital and increases the risk of markdown losses.



SUPPLIER PERFORMANCE & INVENTORY TURNOVER

- Average inventory turnover ratios for fast-selling items are around 24 to 25.
- However, products with low turnover and high stock age highlight underperforming suppliers or procurement issues.



SEASONAL & CYCLICAL DEMAND TRENDS

- Categories like Clothing and Toys peak in autumn, matching forecasted demand spikes (for example, about 97,000 units forecasted for top Clothing SKUs).
- Inventory planning does not fully match these seasonal trends, leading to both stock outs and excess inventory at the same time.



RECOMMENDATIONS

STOCK ADJUSTMENT STRATEGIES

- Phase out slow-moving products (high stock age, low turnover) through targeted promotions or returns to suppliers. This will create warehouse space and lower holding costs.
- Increase reorder frequency and reduce batch size for fast-selling products to decrease stock outs and lost sales.

SUPPLIER PERFORMANCE IMPROVEMENT

- Review suppliers responsible for high stock outs or long lead times. Implement penalties or improvement clauses to boost supply reliability.
- Look for alternative suppliers for underperforming SKUs to ensure consistent availability.



RECOMMENDATIONS

DEMAND-DRIVEN INVENTORY OPTIMIZATION

- Use seasonality-based ordering models to match the identified peaks in Clothing and Toys.
- Integrate rolling 3-month forecasts into procurement decisions to adjust quickly to market changes.

ADDITIONAL STRATEGIC INSIGHTS

- Set up automated dashboards to track turnover, stock age, and stock out rates weekly so we can intervene proactively.
- Examine price elasticity and the effect of promotions on slow-moving items. This will help us refine markdown strategies and speed up clearance.

Two thin, light orange lines intersect on the left side of the slide. One line is horizontal, and the other is diagonal, crossing it.

EXPECTING BUSINESS IMPACT

- Reduce working capital tied up in outdated inventory.
- Minimize stock outs, enhancing customer satisfaction and loyalty.
- Improve supplier relationship management and overall supply chain efficiency.
- Boost profitability through optimized markdowns, better demand matching, and lower holding costs.

Abstract geometric lines in the top left corner.

[DASHBOARD LINK](#)

Click Here to Access the Dashboard

A series of thin, light-brown lines forming an abstract geometric pattern in the top-left corner of the slide. The lines intersect to create various polygonal shapes, some of which are nested within others.

THANK YOU

VIKRANT SINGH

IIT ROORKEE

Presentation Template Credit

<https://create.microsoft.com/en-us/template/minimalist-light-sales-pitch-1ed81438-95a7-4ae9-841d-43ea2c64f7fc>