URBAN RETAIL CO.
INVENTORY OPTIMISATION
PRESENTATION

Ft. Team BOOM-BOOM

1. COMPANY OVERVIEW

– AN INTRODUCTION TO URBAN RETAIL CO.

Urban Retail Co. is a fast-growing, mid-sized retail chain operating through both physical stores and online platforms. It offers 5,000+ SKUs across diverse categories such as groceries, electronics, personal care, and home essentials.

Data Availability vs. Utilization

- Although the company collects extensive data—covering sales, warehouse inventory, and supplier performance—this information is underutilized, limiting visibility into operational trends and inefficiencies.

Key Inventory Problems

- 🔄 Frequent stockouts of high-demand products, resulting in missed sales.
- 📦 Overstocking of slow-moving items, increasing storage costs.
- 🚚 Unreliable supplier performance, leading to poor delivery timelines and planning inefficiencies.

BUSINESS PROBLEMS

Urban Retail Co., despite its data-rich environment, is grappling with critical inventory challenges that hinder growth and operational efficiency. These problems affect **customer satisfaction**, **increase costs**, and **reduce the effectiveness of supply chain decisions.** The key business issues are outlined below:

FREQUENT STOCKOUTS OF FAST-MOVING PRODUCTS

- LEADS TO MISSED SALES OPPORTUNITIES.
- RESULTS IN POOR CUSTOMER EXPERIENCE AND DISSATISFACTION.

OVERSTOCKING OF LOW-DEMAND ITEMS

- LOCKS UP WORKING CAPITAL UNNECESSARILY.
- INCREASES WAREHOUSING AND HOLDING COSTS.

LACK OF REAL-TIME OPERATIONAL INSIGHTS

- INABILITY TO MONITOR SKU PERFORMANCE DYNAMICALLY.
- MAKES REORDER POINT DECISIONS REACTIVE AND MANUAL.
- PREVENTS PROACTIVE INVENTORY MANAGEMENT.

POOR END-TO-END SUPPLY CHAIN VISIBILITY

- INADEQUATE VISIBILITY ACROSS PRODUCT CATEGORIES, STORE LOCATIONS, AND REGIONS.
- MAKES IT DIFFICULT TO TRACK SUPPLIER PERFORMANCE AND MAINTAIN RELIABLE LEAD TIMES.
- HAMPERS COORDINATED PLANNING AND OVERALL OPERATIONAL EFFICIENCY.

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2. EXECUTIVE SUMMARY

OBJECTIVE:

- The goal of this project was to create a robust SQL-driven analytics system to help Urban Retail Co. efficiently manage its inventory across various stores and product categories.
- By applying advanced SQL queries and analytical logic, the project aimed to identify patterns, forecast demand, and detect inefficiencies such as stock imbalances and supplier delays.
- The ultimate objective was to enable data-backed decision-making, reduce operational waste, and drive overall improvement in profitability and supply chain effectiveness.

APPROACH AND METHODOLOGY:

- Our approach consisted of the following key components:
- • Data Modeling: Created a normalized relational schema with three core entities — Store, Product, and Inventory.
- • Query Design: Developed modular, scalable SQL scripts to extract and analyze data using joins, aggregations, and window functions.
- • KPI Tracking: Focused on core performance metrics such as inventory turnover, stockout frequency, forecast accuracy, and reorder thresholds.
- • Forecast Evaluation: Compared actual sales vs. demand forecasts to assess prediction accuracy and recommend corrective actions.

KEY FINDINGS AND INSIGHTS:

- Fast-moving SKUs are frequently understocked, resulting in lost sales.
- Overstocking is prevalent among low-demand items, locking up working capital and increasing storage costs.
- Forecast models currently in place are prone to systematic errors, particularly for seasonal items.
- Supplier performance variability is a contributing factor to inventory imbalance across stores.

STRATEGIC RECOMMENDATIONS:

- Implement dynamic reorder points using historical average sales with safety buffers.
- Revamp demand forecasting by incorporating trend analysis and seasonal adjustments.
- Establish automated alerts for low inventory levels and high forecast variance.
- Regularly audit supplier lead times and consistency to inform procurement decisions.
- Develop visual dashboards for real-time KPI tracking and executive decision support.

EXPECTED BUSINESS IMPACT:

- The recommended solutions are projected to yield the following benefits:
- Up to 30% reduction in stockouts of high-demand products.
- 20–25% decrease in overstock-related carrying costs.
- Improved customer satisfaction and repeat purchase rates through better product availability.
- Enhanced supply chain resilience and strategic inventory planning.

CONCLUSION:

- Applied advanced SQL analytics to uncover inefficiencies and trends in inventory operations.
- Designed a scalable framework to support data-driven inventory monitoring and optimization.
- Generated actionable insights that can guide tactical business decisions across sales, procurement, and warehousing.
- Established a foundation for continuous improvement and competitive advantage in a fast-evolving retail market.

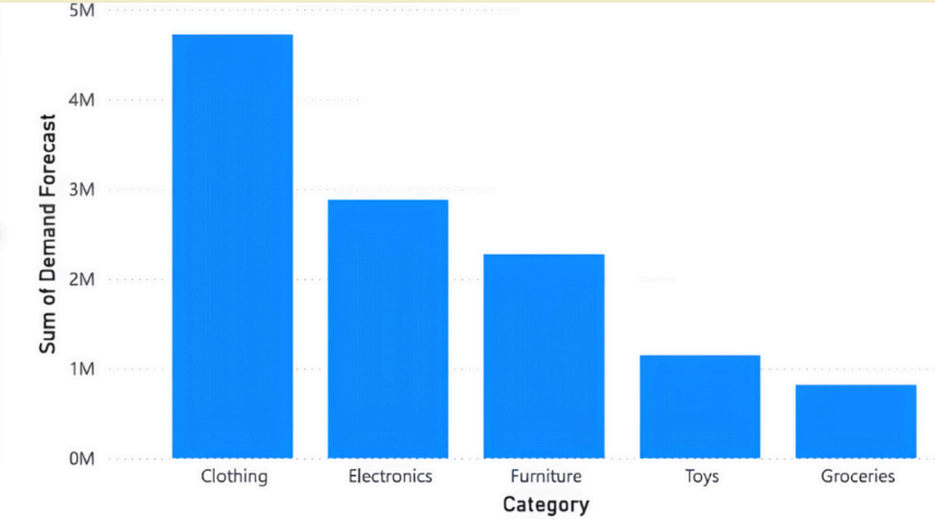
– KPI DASHBOARD

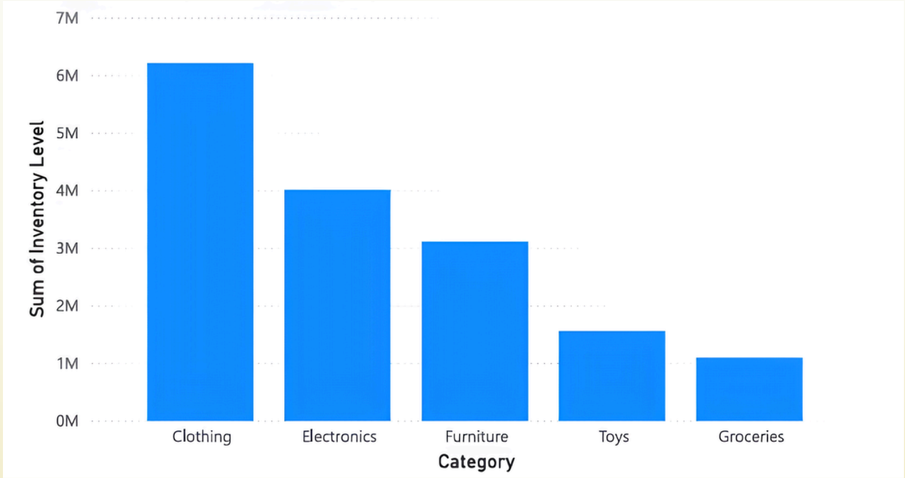
Inventory level

- Tracks current stock quantities
- Organizes products into groups (e.g., electronics, clothing)
- Helps balance stock levels to avoid shortages or excess

1

SUM OF DEMAND FORECAST BY CATEGORY:





SUM OF INVENTORY LEVEL BY CATEGORY:

2

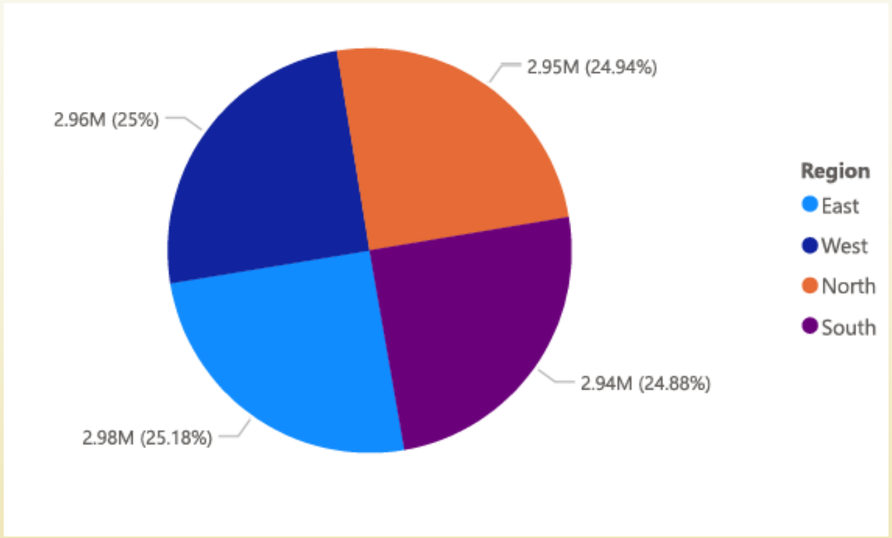
Demand Forecast

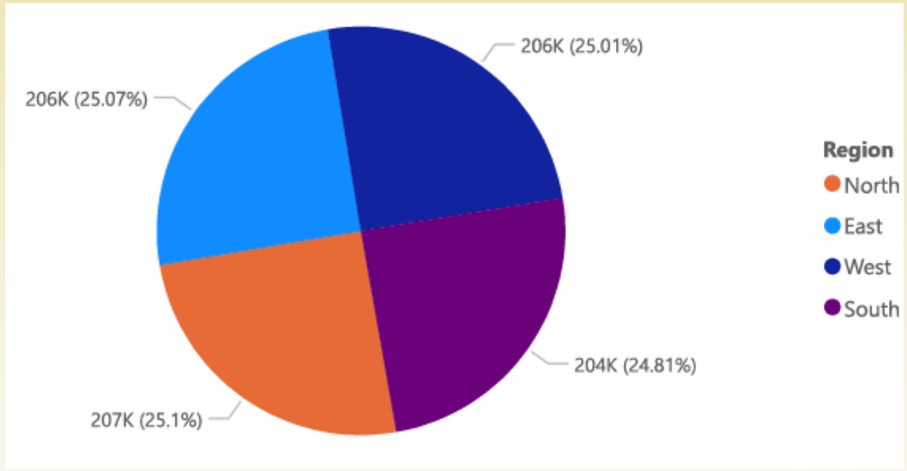
- Predicts future demand using past data.
- Groups similar products (e.g.,beverages,electronics).
- Improves inventory and budgeting decisions.

- **Demand Forecast**: Predicts future product sales.
- **Region**: Geographic sales location.
- **Regional Comparison:** Reveals area-specific trends to optimize inventory and marketing.

3

SUM OF DEMAND FORECAST BY REGION





SUM OF DISCOUNT BY REGION

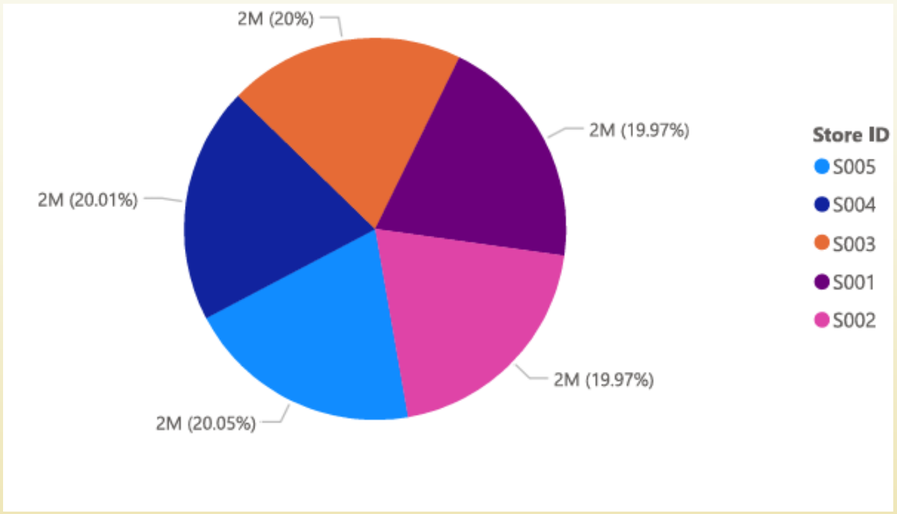
4

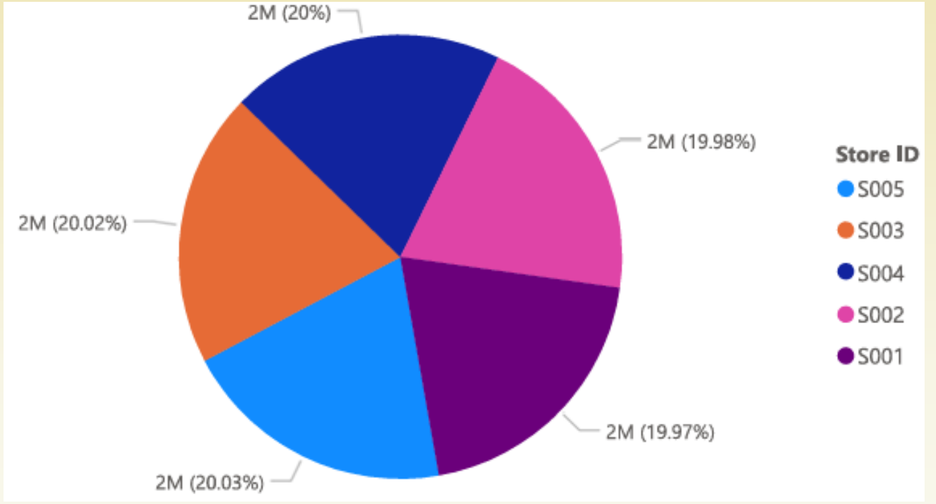
- **Discount:** Reduction in product price.
- **Region**: Geographical area where products are sold.
- **Regional Discount Analysis:** Helps businesses understand sales impact and optimize promotions by location.

- **Units Ordered**: Quantity of products requested/restocked by a store.
- **Store ID**: Unique code identifying each store location.
- **Store-wise Analysis**: Reveals restocking patterns and demand variations per store.

5

SUM OF UNITS ORDERED BY STORE ID





SUM OF UNITS SOLD BY STORE ID

6

- **Units Sold**: Quantity of products purchased by customers
- **Store ID**: Unique identifier for each store location
- **Performance Insight**: Reveals top/low-performing stores by comparing sales across locations

– DATABASE SCHEMA EXPALNATION

NORMALISED INTO 8 TABLES

PRODUCTS

- PRIMARY KEY: PRODUCT_ID
- CAPTURES IMMUTABLE ATTRIBUTES: CATEGORY, PRICE, AND SEASONALITY
- ENABLES PRODUCT-LEVEL ANALYSIS

STORES

- PRIMARY KEY: STORE_ID
- STORES STATIC METADATA LIKE REGION
- SUPPORTS REGIONAL DEMAND FORECASTING AND STOCKOUT ANALYSIS

INVENTORY LOG

- COMPOSITE PRIMARY KEY: DATE, STORE_ID, PRODUCT_ID
- TRACKS DAY-WISE INVENTORY ACROSS STORES
- SERVES AS THE FOUNDATION FOR STOCKOUT, OVERSTOCK, AND CAPITAL LOCK CALCULATIONS

SALES LOG

- COMPOSITE PRIMARY KEY: DATE, STORE_ID, PRODUCT_ID
- CAPTURES GRANULAR, DATE-WISE SALES TRANSACTIONS
- ENABLES COMPUTATION OF TURNOVER RATES AND FORECASTING ERROR

ORDER LOG

- COMPOSITE PRIMARY KEY: DATE, STORE_ID, PRODUCT_ID
- RECORDS UNIT ORDERS PLACED PER PRODUCT PER STORE PER DAY
- HELPS INFER REPLENISHMENT PATTERNS AND REORDER FREQUENCY

DEMAND FORECAST LOG

- COMPOSITE PRIMARY KEY: DATE, STORE_ID, PRODUCT_ID
- ISOLATES PREDICTED DEMAND VALUES
- CRUCIAL FOR EVALUATING FORECAST ACCURACY AND SUPPLIER PERFORMANCE

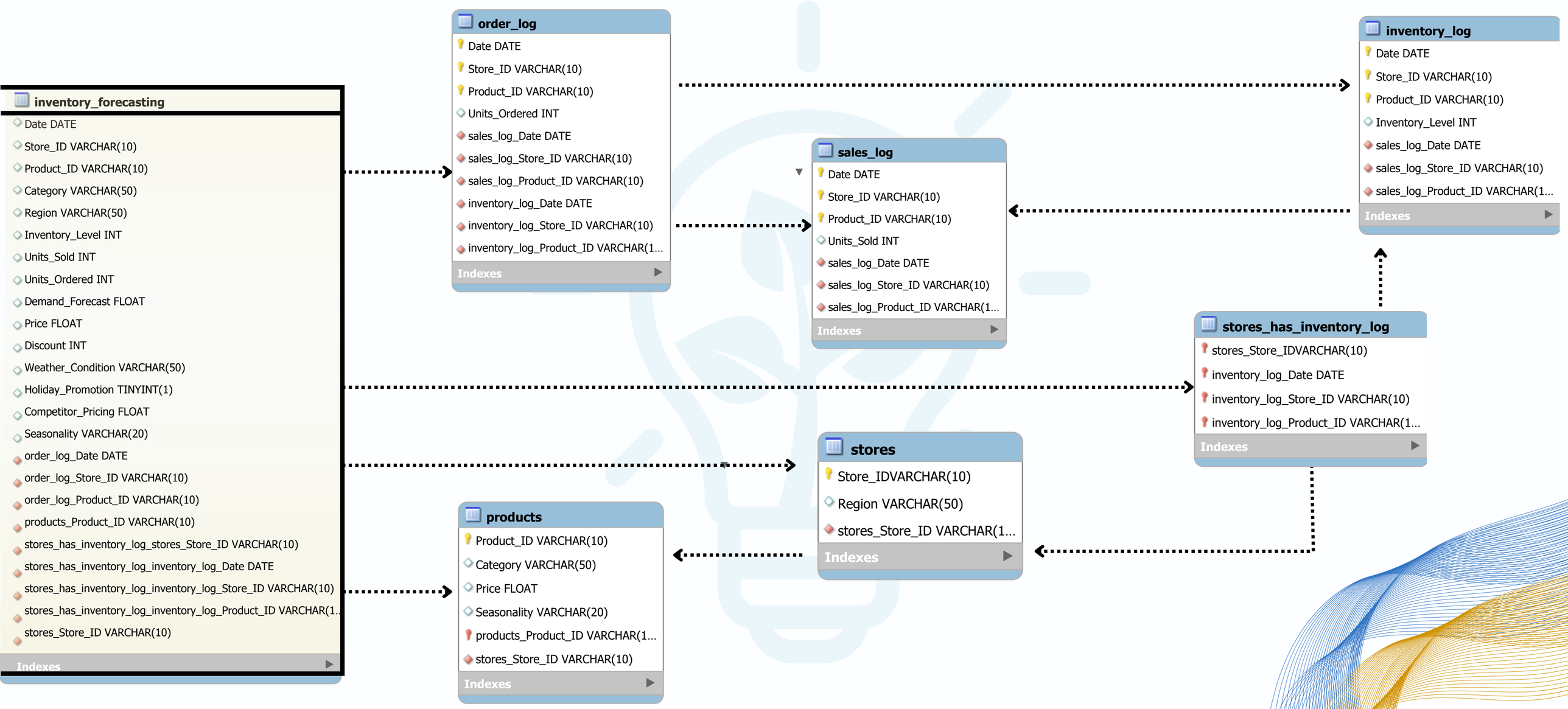
PROMOTION

- COMPOSITE PRIMARY KEY: DATE, STORE_ID
- STORES INFORMATION ON APPLIED DISCOUNTS AND HOLIDAY_PROMOTION
- USEFUL FOR MEASURING SALES UPLIFT DURING CAMPAIGNS

EXTERNAL AFFAIRS

- COMPOSITE PRIMARY KEY: DATE, STORE_ID, PRODUCT_ID
- INCLUDES WEATHER_CONDITION AND COMPETITOR_PRICING
- DESIGNED TO ASSESS EXTERNAL INFLUENCES ON DEMAND

– ERD FOR SOLVING INVENTORY INEFFICINCIES



– BUSINESS RECOMMENDATION

To further elevate the impact and usability of this SQL-driven inventory optimization system, the following enhancements are proposed:

1. Integration with Machine Learning Models

2. Real-Time Data Ingestion and Alerts

3. Supplier and Delivery Performance Integration

4. Geospatial and Climate Data Integration

5. Automated Reorder System

– APPENDIX

TOOLS USED FOR SQL-BASED INVENTORY OPTIMIZATION PROJECT

- **MYSQL 8.0** : USED FOR CREATING THE DATABASE, WRITING AND EXECUTING SQL QUERIES.
- **MYSQL WORKBENCH** : UTILIZED FOR SCHEMA MODELING, QUERY TESTING, AND MANAGING RELATIONAL TABLES.
- **EXCEL** : USED FOR INITIAL DATA EXPLORATION, CLEANING, AND VALIDATING OUTPUT SNAPSHOTS.
- **POWER BI** : EMPLOYED TO CREATE VISUAL DASHBOARDS AND KPI SUMMARIES BASED ON SQL OUTPUTS

LINK TO MY SQL SCRIPT

HTTPS://DRIVE.GOOGLE.COM/FILE/D/1-NJQNPNIK6MS9YY1ZFZFOG8FERZLVL1Q/VIEW?USP=SHARING

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THANK YOU