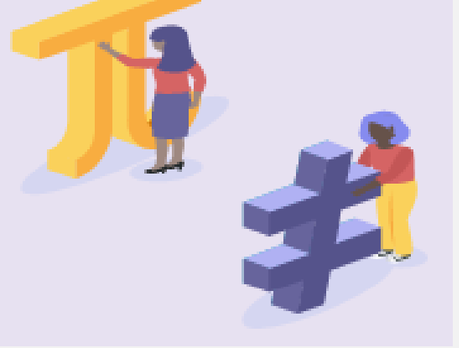
BUSINESS DATA MANAGEMENT

CAPSTONE PROJECT

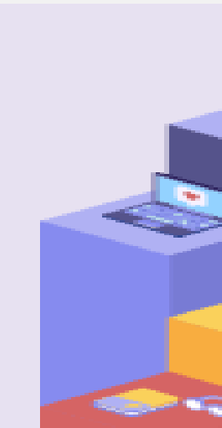
Analyzing Customer Behavior to Optimize Stock Levels

Presented By:
Vijayageetha V
23F1000049



OUTLINE

- Organisation Background
- Problem Statement
- Analysis on Collected Data of Products and their Details
- Proposed Solutions an Expected Outcomes



Problem Statement

1 Stockouts and Overstocking

Balancing inventory to meet customer demand while minimizing excess stock.

2 Seasonal Fluctuations

Adapting to changing demand patterns throughout the year.

3 Customer Satisfaction vs. Cost

Maintaining high customer satisfaction while optimizing inventory

Project Objectives

Analyze Customer Behavior

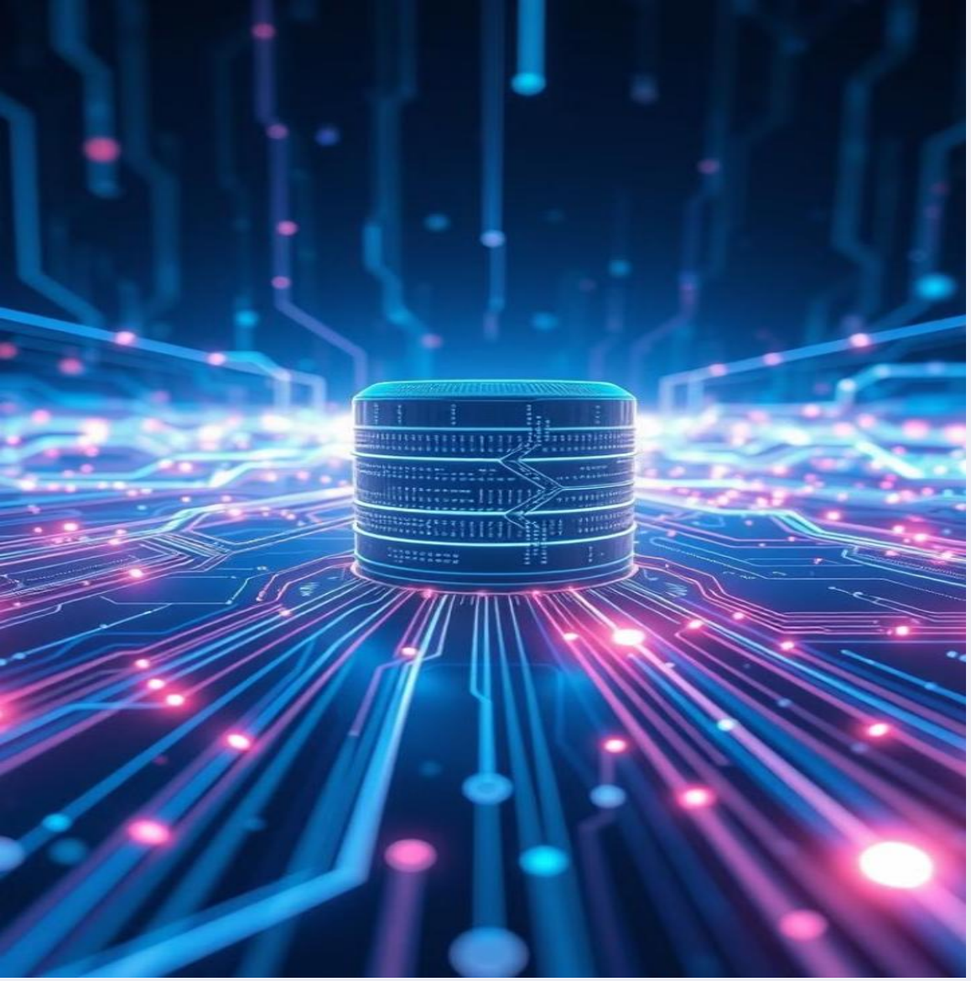
Identify customer purchasing patterns and trends using data mining techniques such as clustering, association rule mining, and time series analysis.

Improve Demand Forecasting

Develop accurate models to predict future product demand using historical sales data, seasonal trends, and external factors like economic indicators and market competition. We'll explore forecasting methods like ARIMA, Exponential Smoothing, and Machine Learning algorithms.

Optimize Stock Levels

Align inventory with real-time demand to reduce waste and stockouts. This will involve implementing a dynamic inventory management system that uses demand forecasts, lead times, and safety stock calculations.



Data Collection and Sources

Tools Used: Microsoft Excel, Google Sheets, Python for data analysis, visualization, and predictive modeling.

Data Collection: Primary data collected over two years from Reliance Digital’s point-of-sale systems.

Time Frame

2 years of data (2022-2024) from electronics shop .

Attributes

Customer purchases, product details, pricing, payment modes, and ratings.

Data Quality

Cleaned for inconsistencies using Excel, Python, and visualization libraries.

Detailed Analysis Process

1

Data Cleaning

Removed duplicates, addressed missing values, and normalized data.

2

Descriptive Statistics

Calculated key metrics like average sales, product popularity, and customer demographics.

3

Exploratory Data Analysis (EDA)

Visualized sales trends, seasonal patterns, and customer preferences.

4

Correlation Analysis

Analyzed the relationships between key variables like product price, customer ratings, and sales volume.

5

Time Series Analysis

Studied sales trends over time to identify recurring patterns and forecast future demand.

6

Predictive Modeling

Used regression analysis and other predictive models to forecast demand and optimize inventory.

Top Revenue Generating Products

TVs

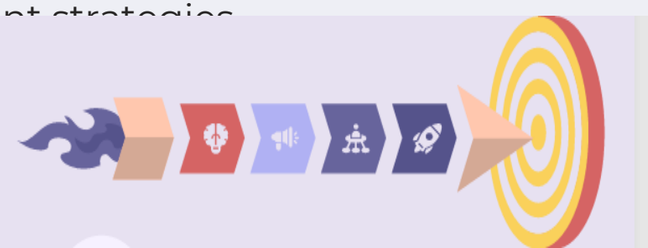
TVs are the highest revenue generating product category, driven by strong demand for larger screens and advanced features like 4K and smart TV capabilities. Consumers upgrading their home entertainment systems have significantly contributed to this success.

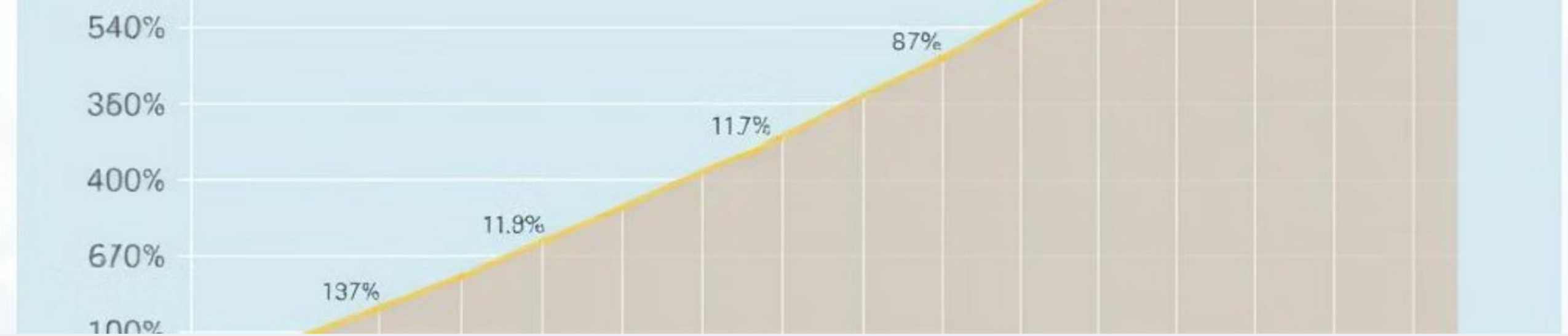
Washing Machines

Washing machines are the second-highest revenue generating category. The popularity of smart features, energy-efficient models, and larger capacity washing machines have contributed to this success.

Marketing Focus

To maximize revenue generation, we recommend focusing marketing efforts on TVs and Washing Machines. We can leverage targeted promotions, advertising campaigns, and customer engagement strategies.





Time Series Analysis

Trend

Increasing demand for electronics over time.

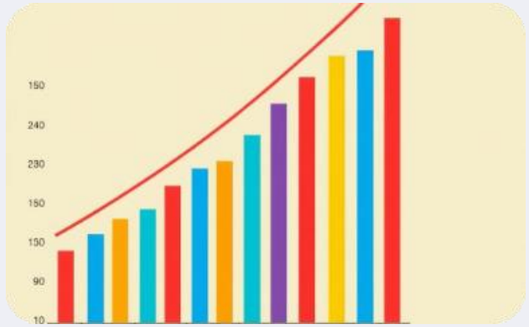
Seasonality

Sales peaks during festivals and promotional events.

Decomposition

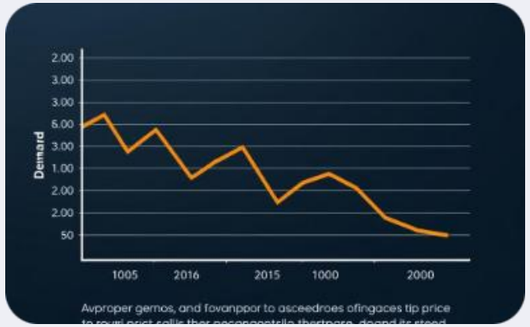
Sales data broken into trend, seasonality, and noise components.

Recommendations



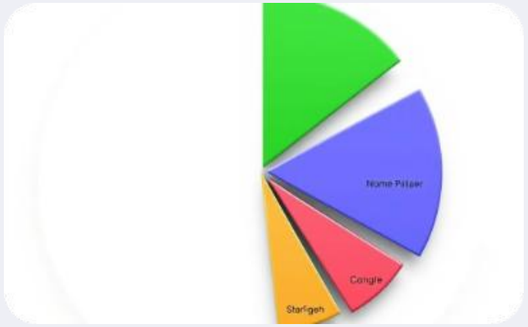
Seasonal Adjustment

Adjust inventory based on seasonal demand patterns.



Dynamic Pricing

Implement flexible pricing strategies during high-demand periods.



Focus Products

Prioritize best-selling items for higher profitability.

Targeted Promotions

Offer specific deals for slower-moving inventory items.

Thank you for your time and attention