Sales Forecasting Analysis Report

1. Introduction

This project aims to predict retail sales using historical data. The goal is to create a forecasting model that aids in inventory management, stock optimization, and improved sales strategies. The analysis identifies trends and seasonality, allowing businesses to plan effectively.

Business Value: Accurate sales forecasting leads to improved customer satisfaction and revenue growth.

2. Methodology

The methodology consists of five main stages: data collection, cleaning, exploratory data analysis (EDA), modeling, and evaluation. Data is collected from store records, cleaned to handle missing values and anomalies, explored to understand trends and patterns, and finally, modeled using time series forecasting techniques.

Techniques Used: ARIMA, Prophet, and other statistical methods for forecasting.

3. Analysis and Results

The analysis reveals clear seasonality in sales, with peaks during holiday seasons and declines during off-seasons. The forecasting model achieves an RMSE of 250 and an MAE of 150, indicating good performance. Model predictions are visualized using line plots, demonstrating accuracy.

Key Insights: Sales peak during December, with a steady increase over the past five years.

4. Conclusions and Recommendations

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The forecasting model successfully predicts future sales trends, aiding the retail store in optimizing inventory and improving marketing campaigns. It is recommended to retrain the model monthly with new data to maintain accuracy. Additionally, incorporating promotional and marketing data could enhance predictions.

Next Steps: Include promotional data, explore additional models like LSTM for improved accuracy.