E-Commerce Sales Analysis for Data-Driven Decision Making

Task 4 > Subtask 2

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■ Subtask 2: Choose and Apply a Forecasting Model

Forecasting is a crucial step in **predicting future sales trends** based on historical data. E-commerce companies like **Flipkart**, **Amazon India**, **and Meesho** use forecasting models to:

- Predict future demand and optimize inventory.
- Plan sales strategies for upcoming months.
- · Adjust marketing budgets based on expected revenue.
- Reduce stockouts and overstock situations, improving operational efficiency.

In this step, you will select a suitable time series forecasting model and apply it to your prepared dataset to generate future sales predictions.

Subtask 2: Choose and Apply a Forecasting Model

★ How You Can Perform This Task?

Understand Different Forecasting Models

There are various forecasting techniques available. Choose a model based on your dataset characteristics:

- Moving Average (Simple & Weighted) Best for basic trend analysis without seasonality.
- Exponential Smoothing (SES, Holt, Holt-Winters) Suitable for short-term forecasting and handling trends/seasonality.
- ARIMA (AutoRegressive Integrated Moving Average) Effective for stationary time series and capturing trends & patterns.
 Facebook Prophet Ideal for business forecasting, handles seasonality and special
- events (like Diwali sales).

 LSTM (Long Short-Term Memory Neural Networks) Used for complex deep

Select the Best Model for Your Dataset

- If your sales data shows clear seasonality, models like Holt-Winters Exponential
 Smoothing or Facebook Prophet work best.
- If the data shows a consistent trend but no strong seasonality, ARIMA is a good choice.
- For complex patterns, deep learning-based models like LSTM can be explored.

3 Split Data into Training & Testing Sets

- Divide the dataset into training data (past sales records) and testing data (recent sales data).
- Typically, 80% of the data is used for training and 20% for testing.

learning-based forecasting, works well with large datasets.

This ensures the model is trained on historical sales and tested on real recent data.

Train the Forecasting Model

- Use the selected forecasting model to train it on past sales data.
- Tune parameters for optimal performance (e.g., choosing the right lag values in ARIMA or seasonal effects in Prophet).

Make Predictions & Compare with Actual Sales

- Generate future sales predictions for the next 6-12 months.
- Compare predicted values with actual test data to measure accuracy.
- Use metrics like RMSE (Root Mean Squared Error) or MAPE (Mean Absolute Percentage Error) to evaluate the model.

Analyze the Forecasting Results

- Identify expected sales growth or declines in the coming months.
- Look for seasonal peaks (e.g., major spikes during festive periods).
- Evaluate whether adjustments are needed to improve prediction accuracy.

Tasks Researched different forecasting models and selected the most suitable one. Split the dataset into training and testing sets. Trained the selected forecasting model on historical sales data. Generated future sales predictions for 6-12 months. Compared forecasted results with actual test data for accuracy evaluation. Analyzed the trends in the forecasted sales data.

Overall Progress 0% i Project Overview Step 1: Understanding **Business Requirements and Data Overview** 2 Step 2: Sales Trend Analysis > Step 3: Customer 3 Segmentation Using RFM Analysis Step 4: Sales Forecasting **Using Time Series Analysis** Subtask 1: Prepare Time Series Subtask 2: Choose and Apply a **Forecasting Model** Subtask 3: Predict Future Sales ☐ Subtask 4: Submission Step 5: Business Insights & Recommendations