← E-Commerce Sales Analysis for Data-Driven Decision Making

Task 4 > Subtask 1

📙 Subtask 1: Prepare Time Series Data

Time series analysis is essential for **forecasting future sales trends**, identifying **seasonal patterns**, and making **data-driven business decisions**. Before applying forecasting models, the dataset needs to be properly prepared to ensure accurate predictions.

For e-commerce companies like **Flipkart, Amazon India, and Meesho**, preparing time series data helps in:

- Understanding **historical sales patterns**.
- Identifying **seasonal trends** such as festive sales spikes.
- Forecasting **future demand** for better inventory and marketing planning.

In this step, the goal is to **structure the sales data properly** for time series analysis by organizing it into a **date-wise format**, handling missing values, and ensuring consistency.

Subtask 1: Prepare Time Series Data

🛠 **How You Can Perform This Task?**

1 **Extract & Format Date Information**
- Identify the column containing **order dates** or **transaction timestamps**.
- Convert it into a **datetime format** so it can be processed as a time series.
- Extract useful components like **year, month, week, and day** for deeper insights.

2 **Aggregate Sales Data by Date**
- Summarize the total **sales revenue** for each **day, week, or month**.
- Ensure that sales are **aggregated correctly** to avoid data inconsistencies.
- If the dataset contains multiple transactions per day, compute **daily total sales**.

3 **Handle Missing or Incomplete Data**
- Identify any **missing dates** in the dataset and fill them with appropriate values.
- If sales data is missing for a certain period, decide whether to **impute missing values** or leave them as gaps.
- Ensure that **each time interval (daily, weekly, or monthly)** has a consistent record.

4 **Check for Data Trends & Seasonality**
- Analyze sales data to see if there are **trends (increasing or decreasing sales over time).**
- Identify **seasonal effects**, such as higher sales during Diwali, New Year, or other festive seasons.
- Observe **any fluctuations or anomalies** in the dataset that may need further investigation.

5 **Ensure Data is Sorted and Indexed Properly**
- The dataset should be **sorted chronologically** to maintain a proper time series structure.
- Set the **date column as an index** to make future forecasting easier.

6 **Save the Processed Dataset for Analysis**
- Store the cleaned and structured **time series dataset** in CSV format.
- Ensure that it is **ready for visualization and forecasting models** in the next steps.

Pro Tip: Properly structured time series data improves the accuracy of forecasting models, helping businesses make **better sales predictions, optimize inventory, and maximize revenue.**

Tasks

- ☐ Formatted **date column correctly** into datetime format.
- ☐ Aggregated **sales data by daily, weekly, or monthly intervals**.
- ☐ Checked for **missing or incomplete data** and handled it appropriately.
- ☐ Identified **trends, seasonality, and anomalies** in sales data.
- ☐ Ensured the dataset is **chronologically sorted and indexed**.
- ☐ Saved the **processed time series dataset** for forecasting analysis.

Overall Progress   0%

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

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