Project Proposal: Sales Prediction Using Historical Sales Transactions Data

1. Project Title

- **Sales Prediction Using Historical Sales Transactions Data**

2. Project Overview

This project aims to develop a predictive model that forecasts weekly sales based on the provided historical sales transactions data. The objective is to leverage this model to improve inventory management, optimize marketing strategies, and enhance overall business planning by anticipating future sales trends accurately.

3. Objectives

- **Develop Predictive Models**: Utilize the provided sales transactions data to create a predictive model capable of forecasting weekly sales.
- **Enhance Decision-Making**: Provide reliable sales forecasts to assist in better business planning and resource allocation.
- **Identify Sales Trends**: Analyze historical data to uncover patterns, trends, and key factors influencing sales.
- **Improve Inventory Management**: Use the predictions to optimize inventory levels, reducing both stock outs and excess inventory.

4. Scope

- Analysis of the provided sales transactions data.
- Development of machine learning models to predict weekly sales.
- Evaluation of model performance using appropriate metrics.
- Interpretation of results and integration of the model into decision-making processes.

5. Methodology

- **Data Collection**:
  - **Dataset**: Utilize the provided "Sales_Transactions_Dataset_Weekly.xlsx" containing weekly sales transaction data.
- **Data Preprocessing**:
  - **Cleaning**: Address missing values, outliers, and any inconsistencies in the data.
- **Exploratory Data Analysis (EDA)**:
  - **Trend Analysis**: Identify overall sales trends and seasonality patterns in the data.
  - **Correlation Analysis**: Assess relationships between different variables to identify key drivers of sales.
- **Model Development**:
  - **Model Selection**: Explore various machine learning algorithms such as:
    - **Time Series Models**: ARIMA, SARIMA, and Prophet for capturing time-dependent patterns.

    - **Training and Validation**: Split the data into training and validation sets to assess model performance.
- **Model Evaluation**:
    - Use metrics such as Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and R-squared to evaluate model accuracy.
    - Perform cross-validation to ensure model robustness.

6. Resources Required

- **Data**: The provided "Sales_Transactions_Dataset_Weekly.xlsx".
- **Tools and Software**: Python or R for data analysis and modeling, Jupyter Notebooks for experimentation, and visualization tools like Matplotlib, Seaborn,

7.Conclusion

The Sales Prediction project, utilizing the provided historical sales transactions data, aims to deliver significant value by improving the accuracy of sales forecasts. This project will support better business planning and inventory management, ultimately leading to more informed decision-making and increased operational efficiency.