

Data Collection: Gather historical sales data for the product(s) of interest, including information such as date, quantity sold, and any relevant attributes. Additionally, collect external factors that could influence demand, such as marketing campaigns, holidays, economic indicators, weather data, or social media trends.

Data Preprocessing: Clean and preprocess the collected data to ensure its quality and suitability for training the model. This process may involve handling missing values, encoding categorical variables, scaling numerical features, and splitting the data into training and testing sets.

Feature Engineering: Extract meaningful features from the data that can help the model capture patterns and relationships. This may involve creating time-based features, lagged variables, aggregating data at different time intervals, or incorporating external factors into the dataset.

Model Selection: Choose an appropriate machine learning algorithm for demand forecasting. Some commonly used algorithms for time series forecasting include ARIMA, SARIMA, exponential smoothing methods, or more advanced techniques like recurrent neural networks (RNNs) or gradient boosting algorithms.

Model Training: Split the preprocessed data into training and validation sets. Use the training data to train the machine learning model, adjusting the model's parameters to minimize the difference between the predicted and actual demand. Evaluate the model's performance on the validation set, fine-tune the model if necessary, and repeat this process until satisfied.

Model Evaluation: Assess the performance of the trained model using appropriate evaluation metrics such as mean absolute error (MAE), root mean square error (RMSE), or mean absolute percentage error (MAPE). Compare the model's predictions against the actual demand to gauge its accuracy and reliability.

Deployment and Monitoring: Once satisfied with the model's performance, deploy it in a production environment to make demand forecasts based on new data. Continuously monitor the model's performance and retrain it periodically to adapt to changing patterns and ensure optimal accuracy.

Remember that the success of the demand forecasting model depends on the quality and relevance of the collected data, the appropriate choice of features, and the selection of a suitable machine learning algorithm. Regular monitoring and updates are essential to maintain the model's accuracy over time.