
# Walmart Sales Forecasting

Presented by:
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# Project Overview

## Situation

In a dynamic retail environment influenced by seasons, market fluctuations, and diverse products, Walmart requires accurate sales projections. These forecasts are vital for efficient operations , guiding the company through ever-changing market dynamics and ensuring informed, forward-looking choices.

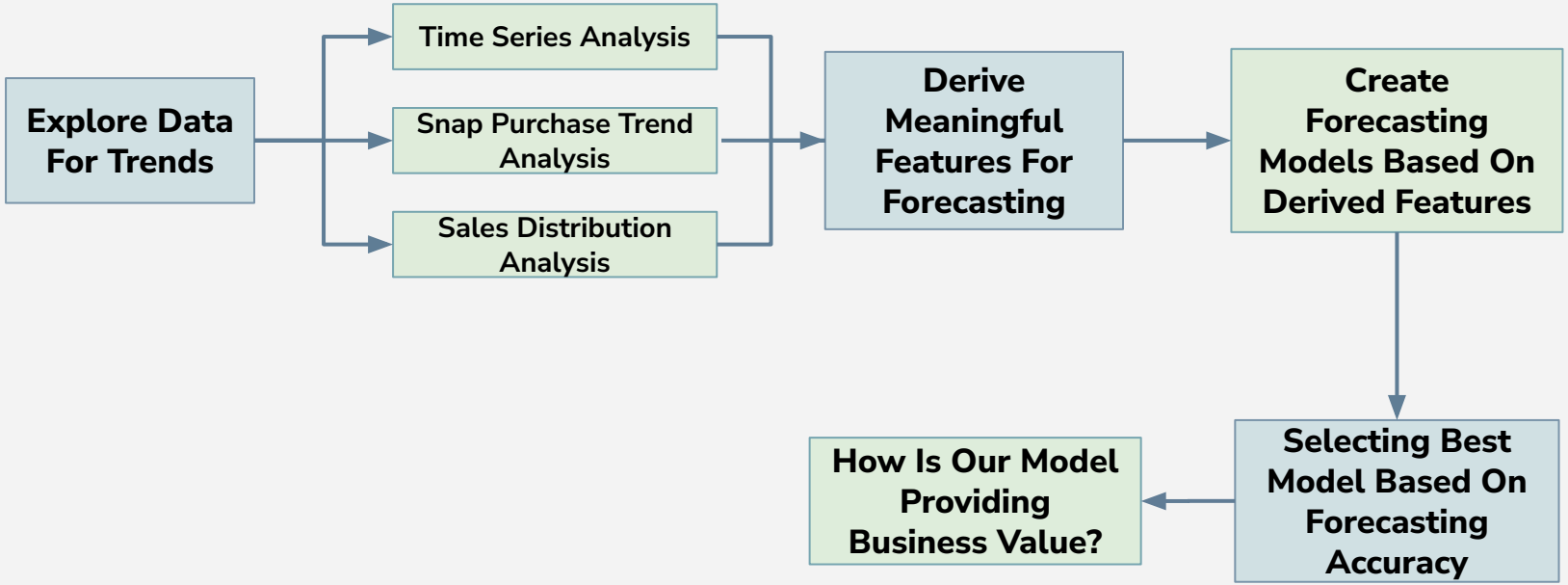
## Complication

Sales predictions encounter inherent challenges due to the diversity of product lines and differing consumer behaviors across various locations, which pose obstacles to accurate forecasting. Additionally, market shifts add further complexity to sales estimations, making them more challenging to predict with precision.

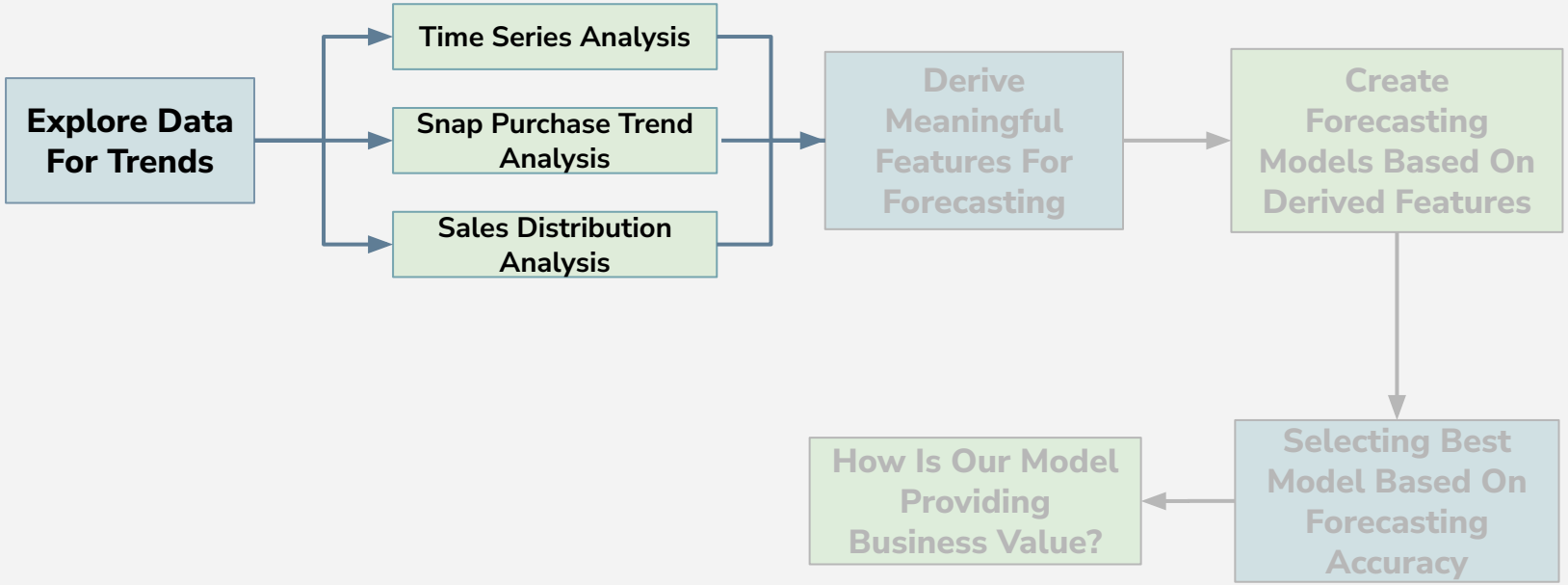
## Key Question

**How can Walmart develop a sales forecasting model that efficiently adapts to dynamic market changes, and ensures precise sales projections across its stores?**

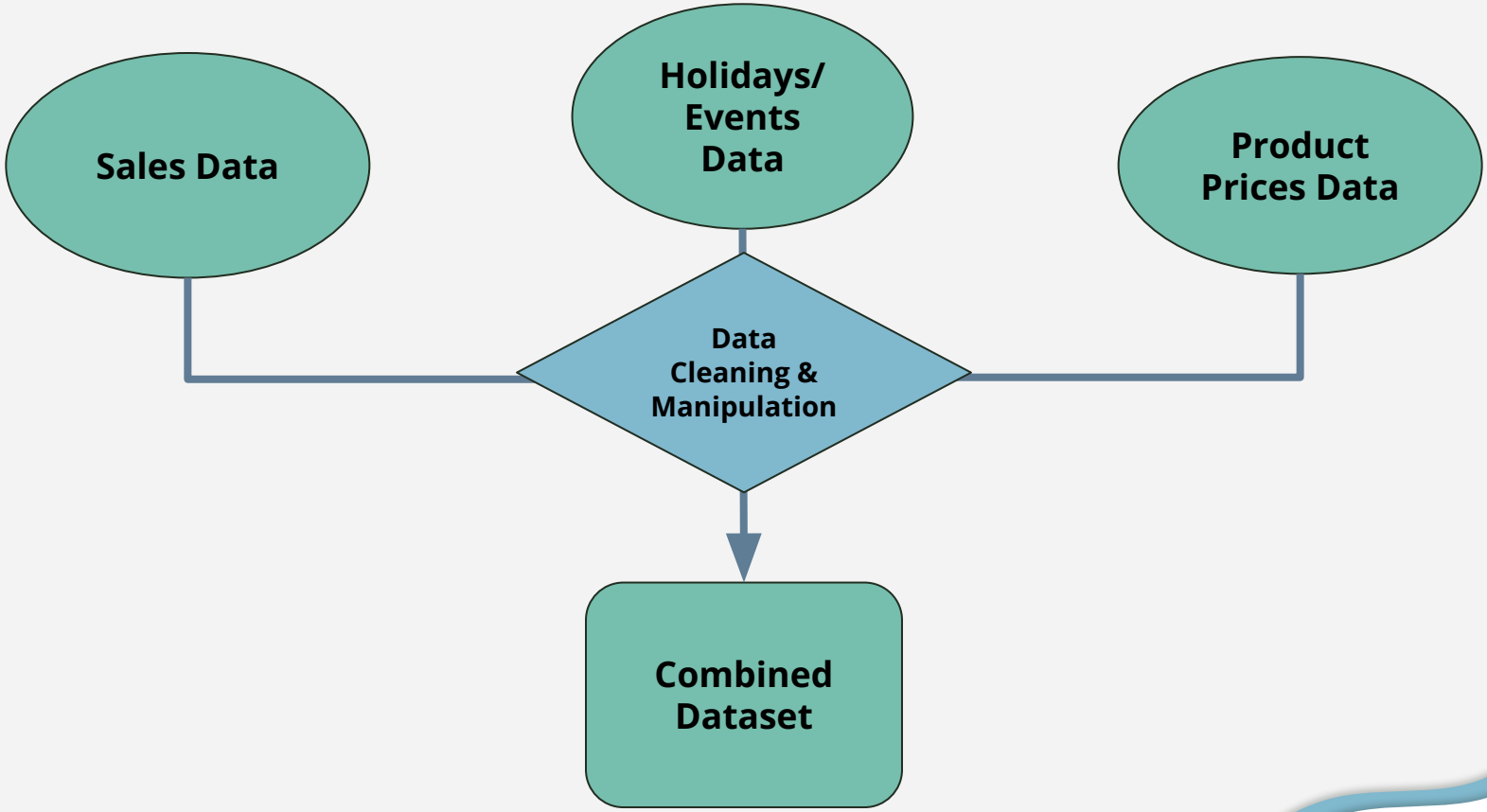
# Solution Map



# Solution Map

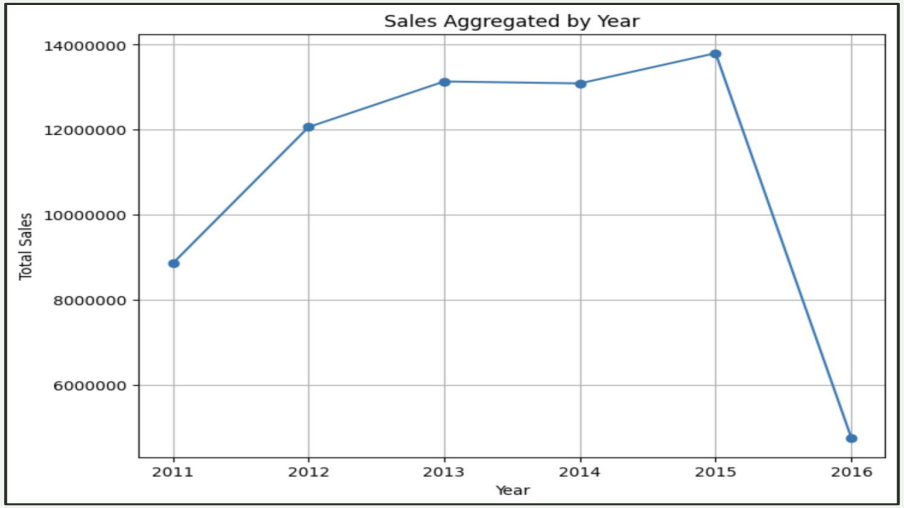


# Data Overview

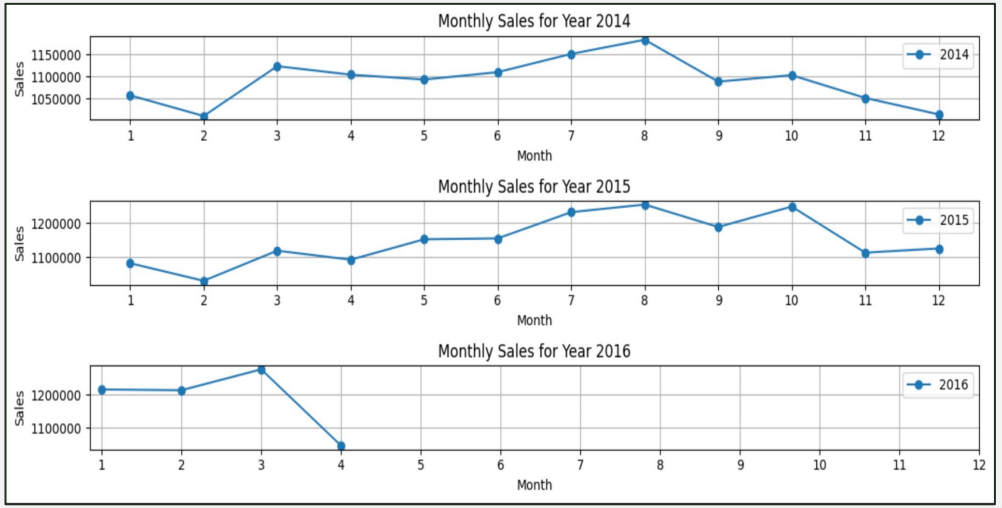


# Time Series Analysis

**Historical Yearly Sales**

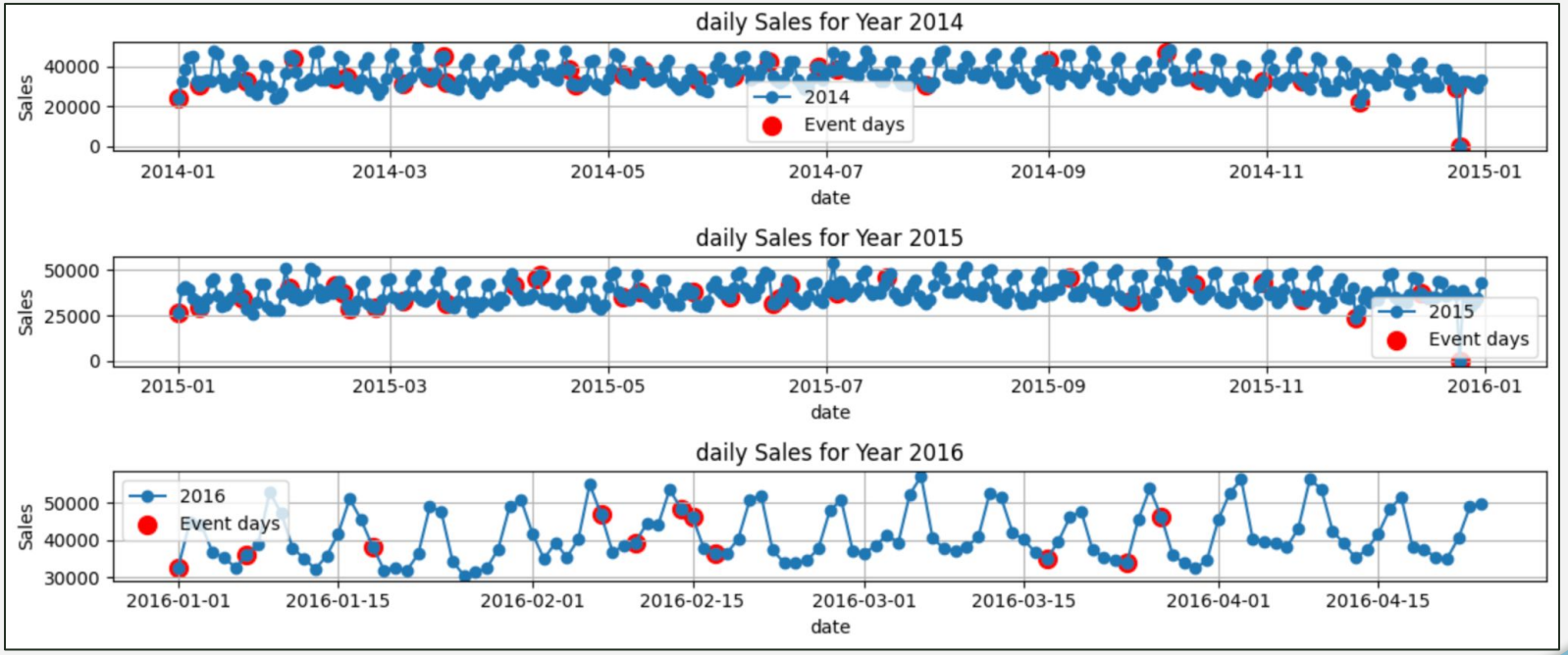



**Historical Monthly Sales (YoY)**



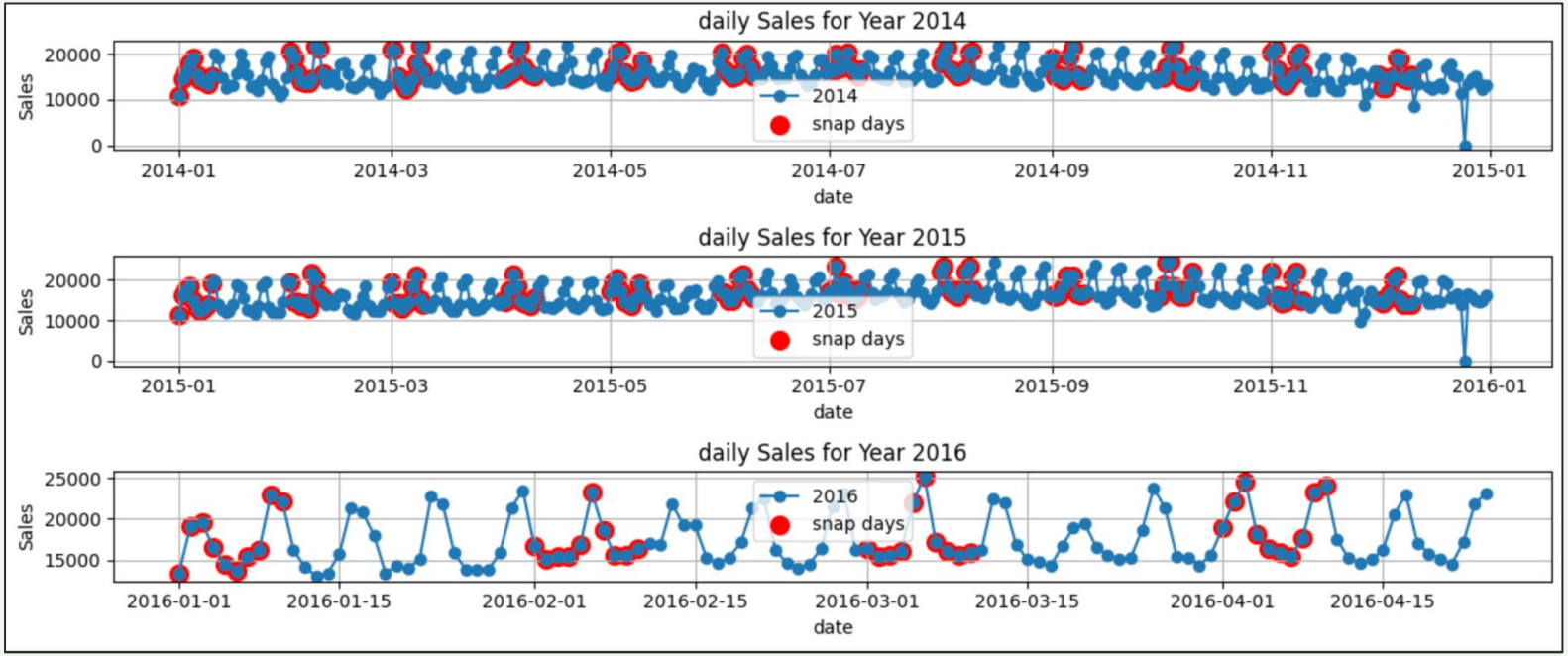
# Time Series Analysis

**Daily Sales with Event Days (YoY)**



# SNAP Purchase Trend Analysis

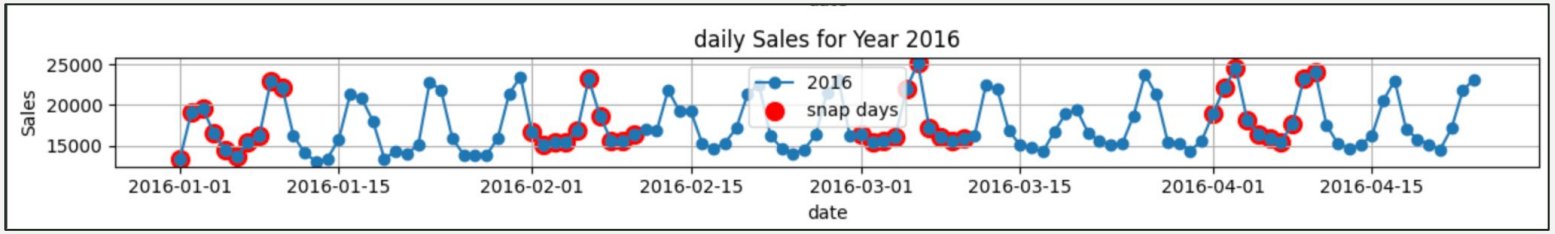
**Daily Sales with SNAP Days (YoY)**



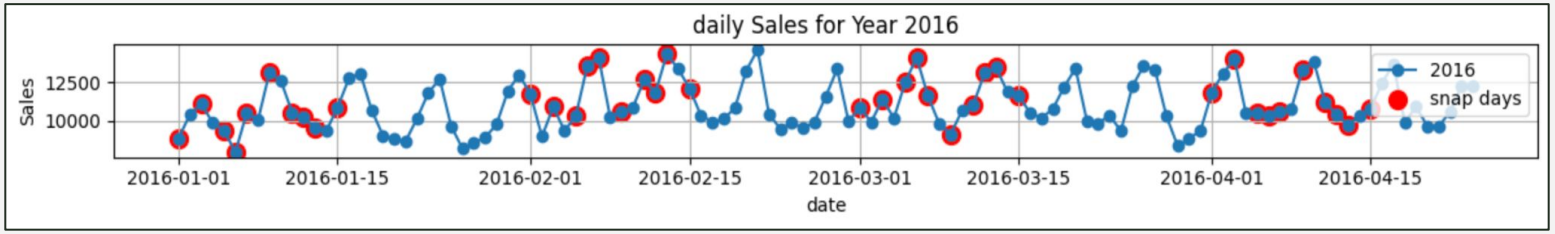
# SNAP Purchase Trend Analysis

**Daily Sales with SNAP Days (2016)**

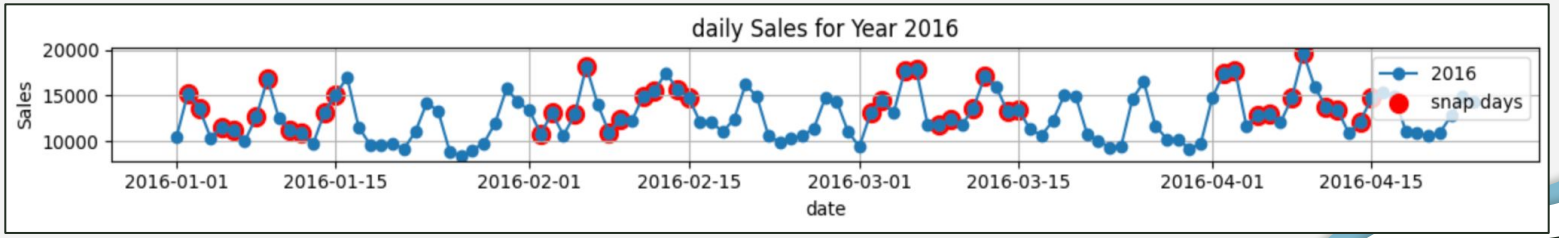
## California




## Texas

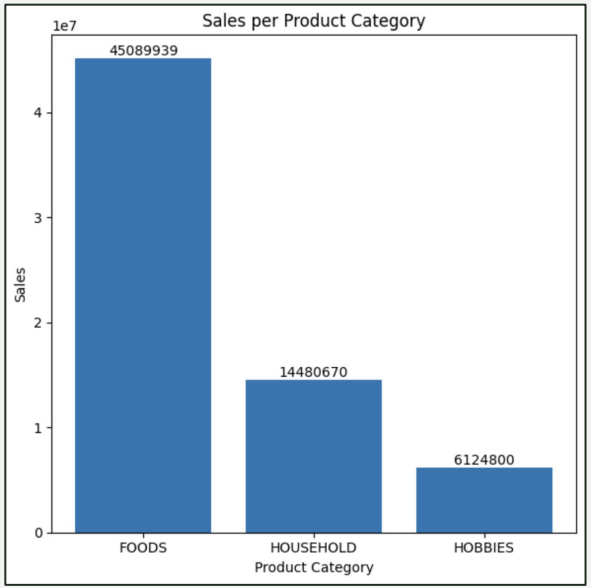



## Wisconsin

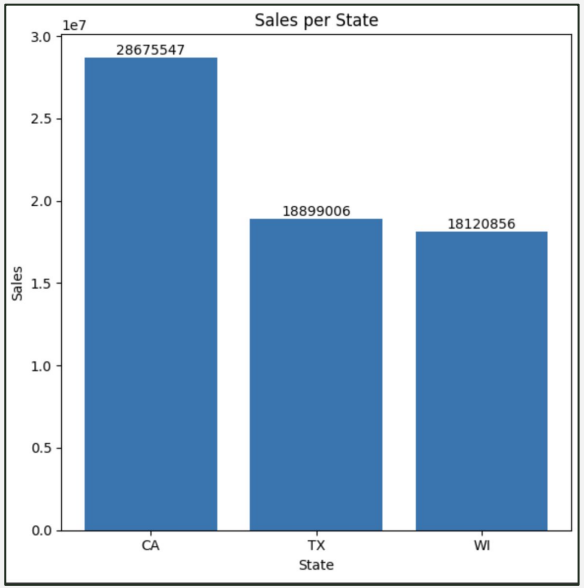


# Sales Distribution Analysis

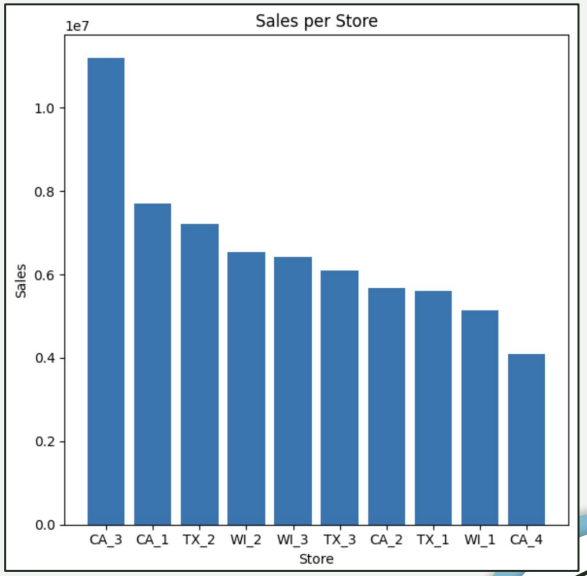
**Category Level**



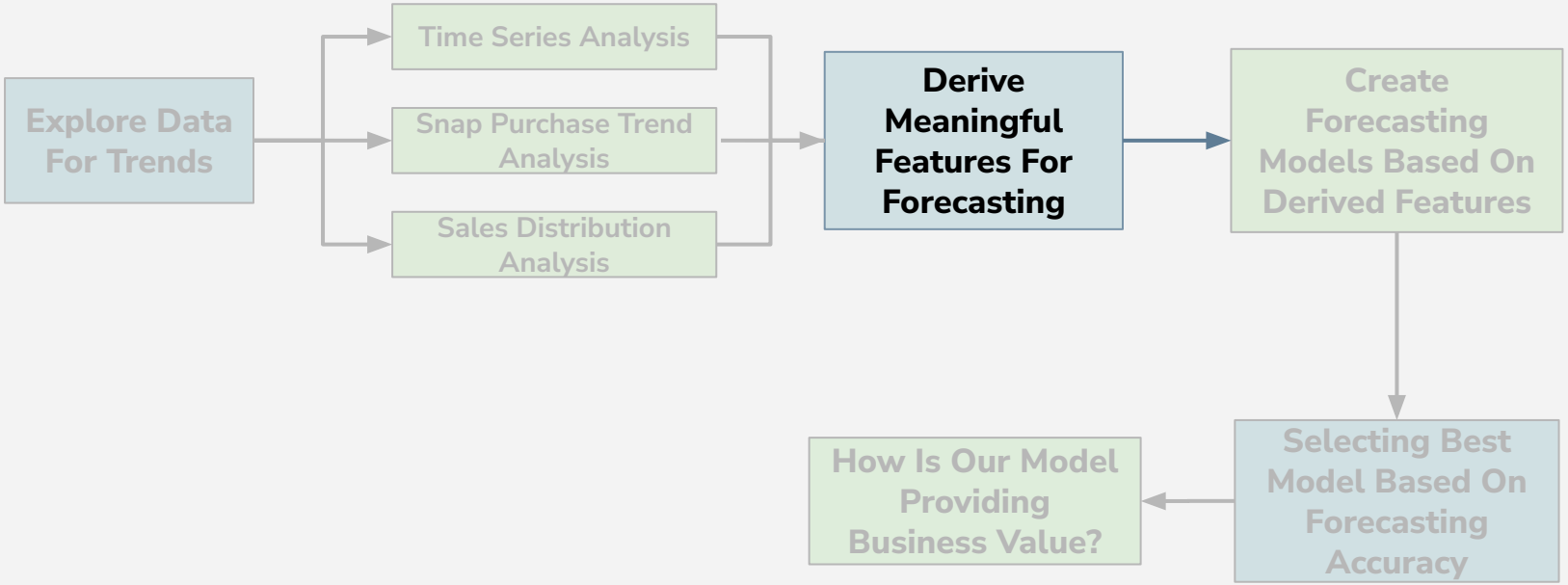

**State Level**



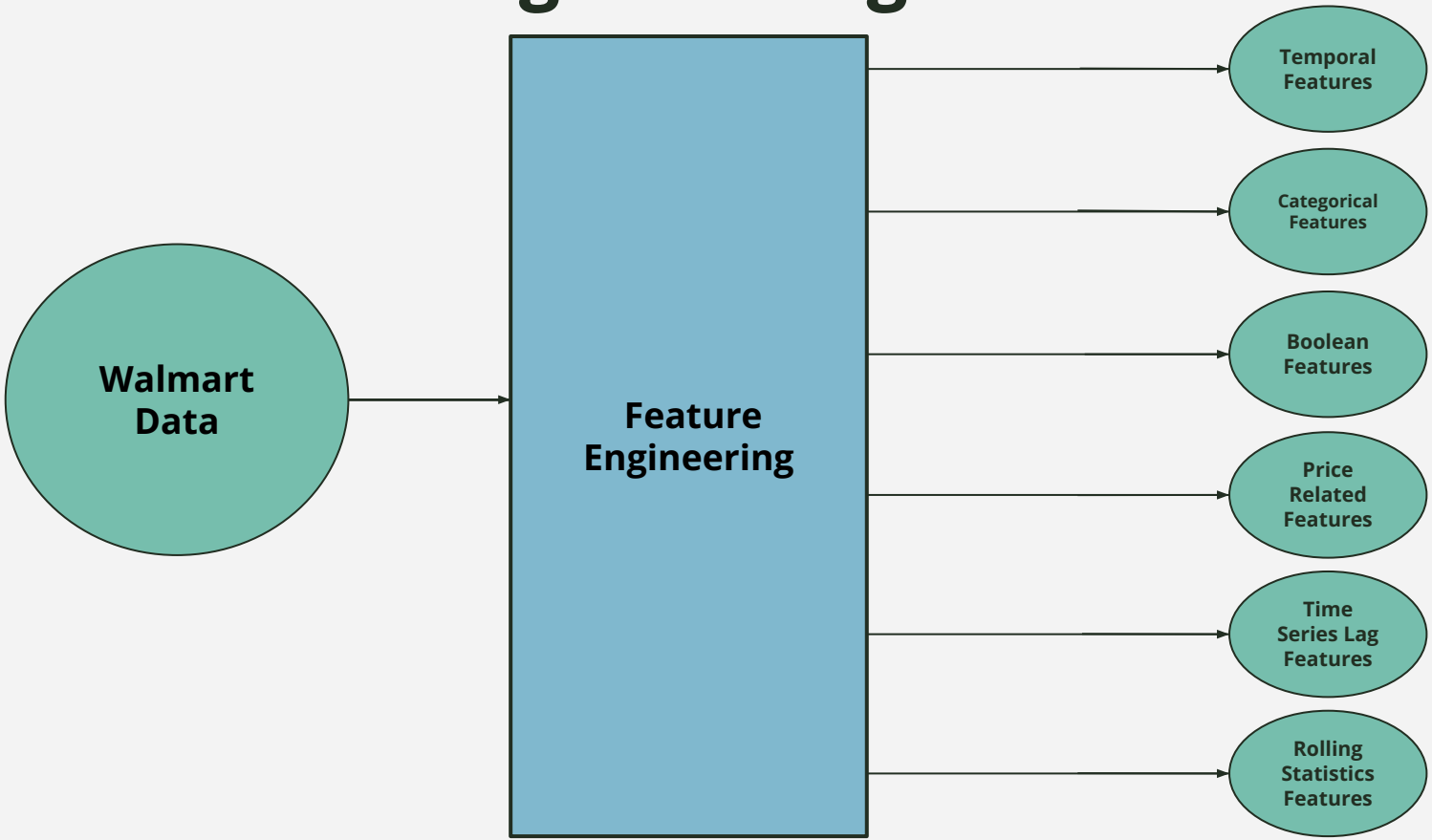

**Store Level**



# Solution Map



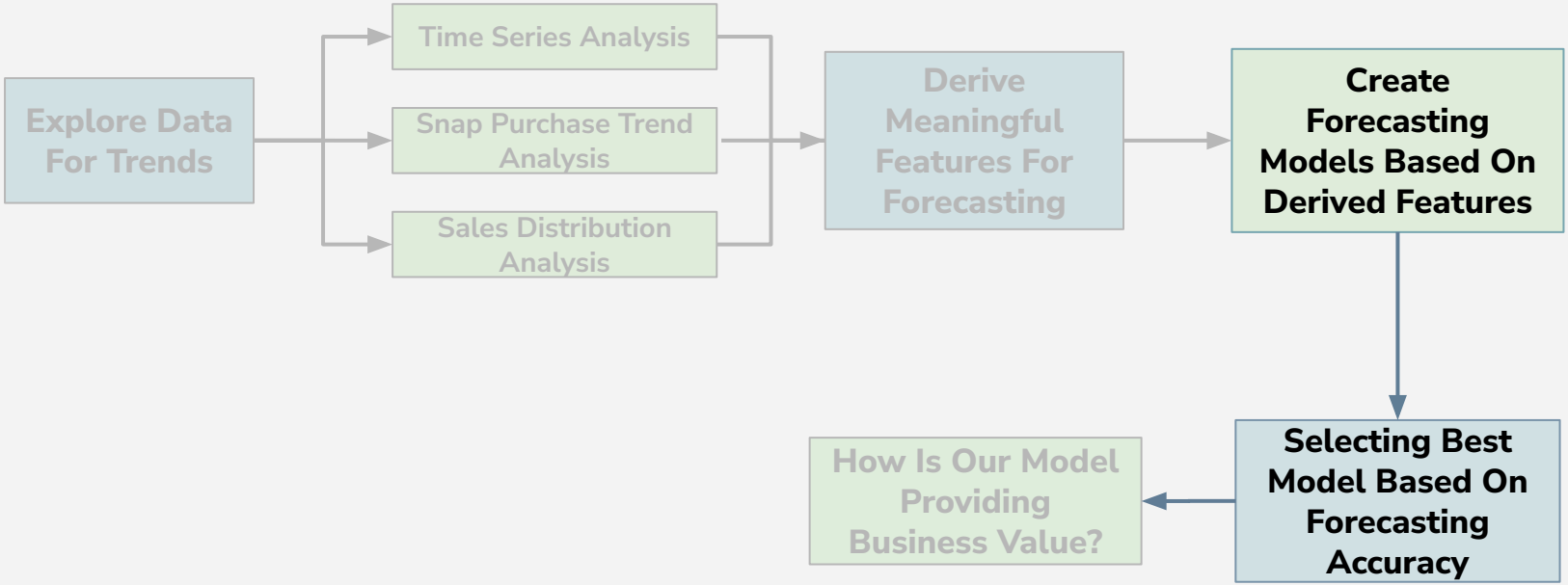
# Deriving Meaningful Features



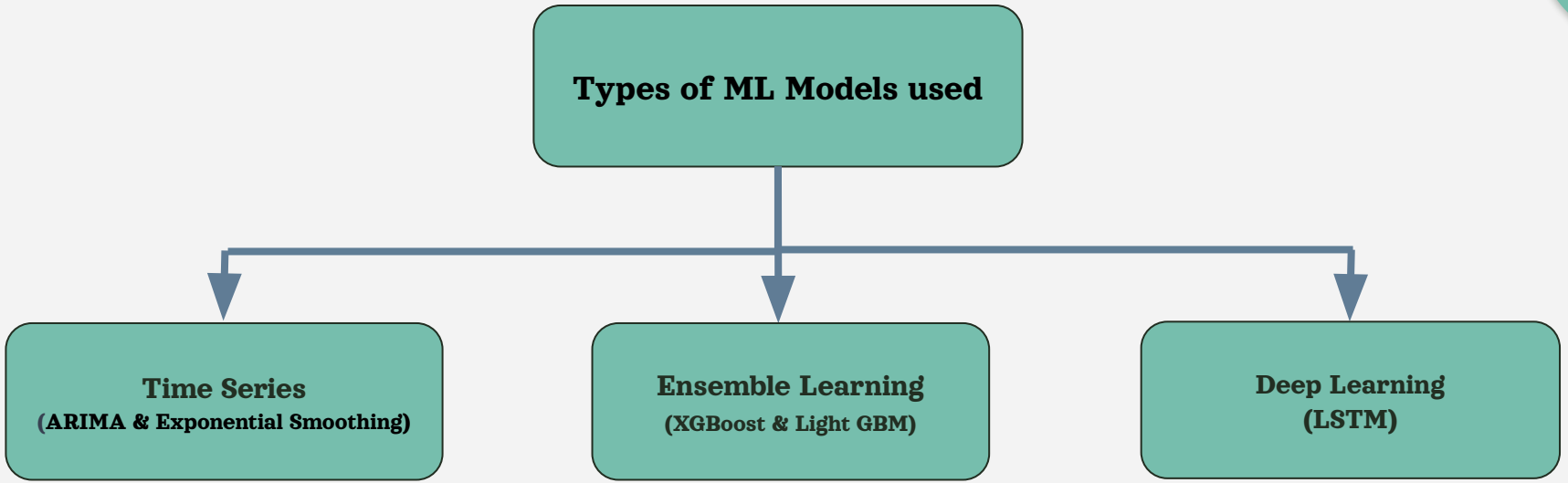
# Features Used For Model Creation

| Temporal Features | Categorical Features | Boolean Features | Price Related Features | Time Series Lag Features | Rolling Statistics Features |
|---|---|---|---|---|---|
| Year | Item IDs | Weekend Or Not ? | Rolling Price Standard Deviation | Lag Values Of Sales | Rolling Mean Of Sales |
| Month | Category IDs | SNAP Purchase ? | Price Change | Lag Value Of Revenue | Rolling Standard Deviation Of Sales |
| Day | State IDs | | | | Rolling Skewness of Sales |
| Day Of Week | Department IDs | | | | Rolling Kurtosis of Sales |

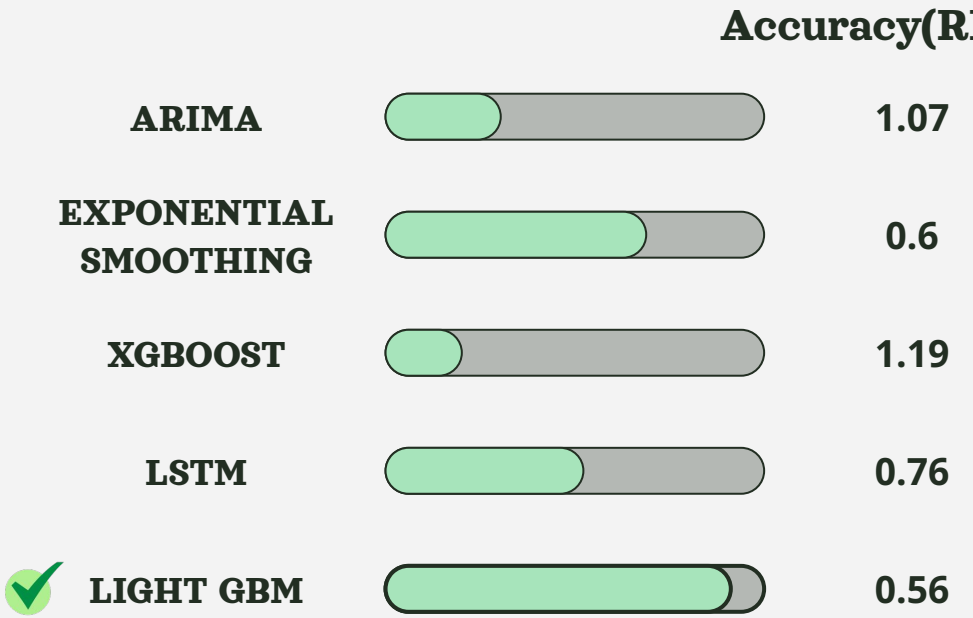
# Solution Map



# Model Creation Based on Derived Features



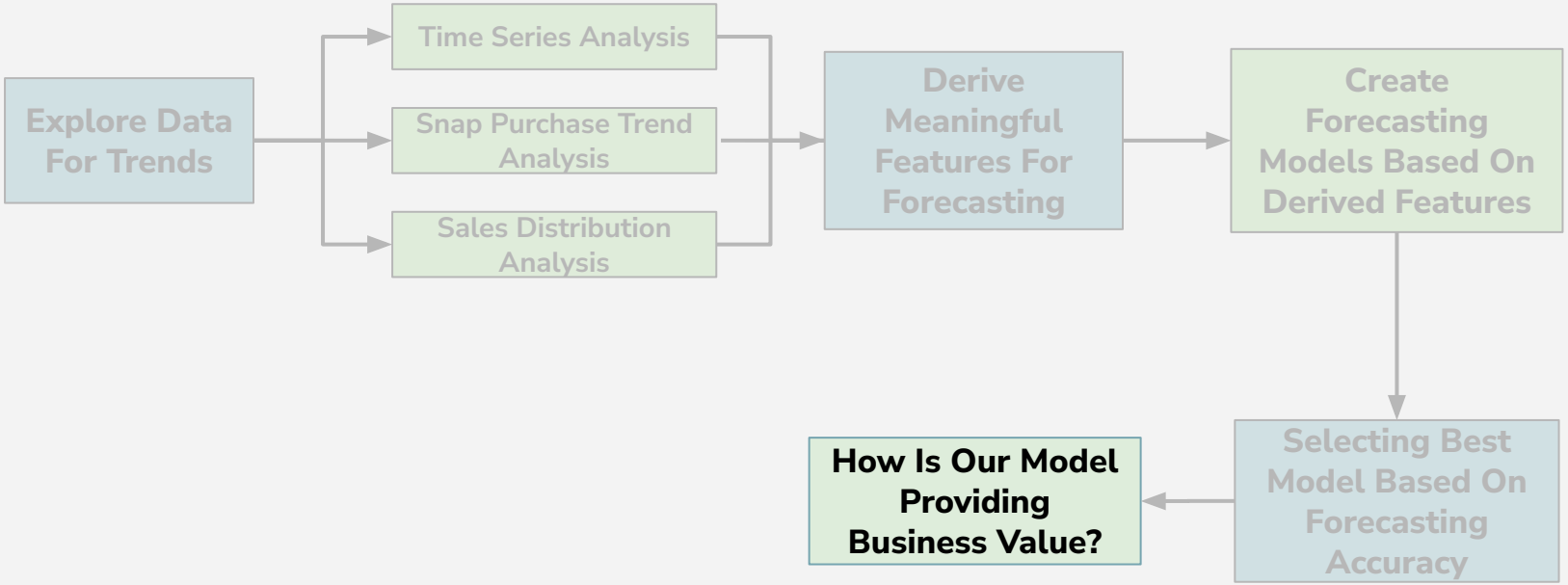
# Model Selection Based On Accuracy(RMSSE)



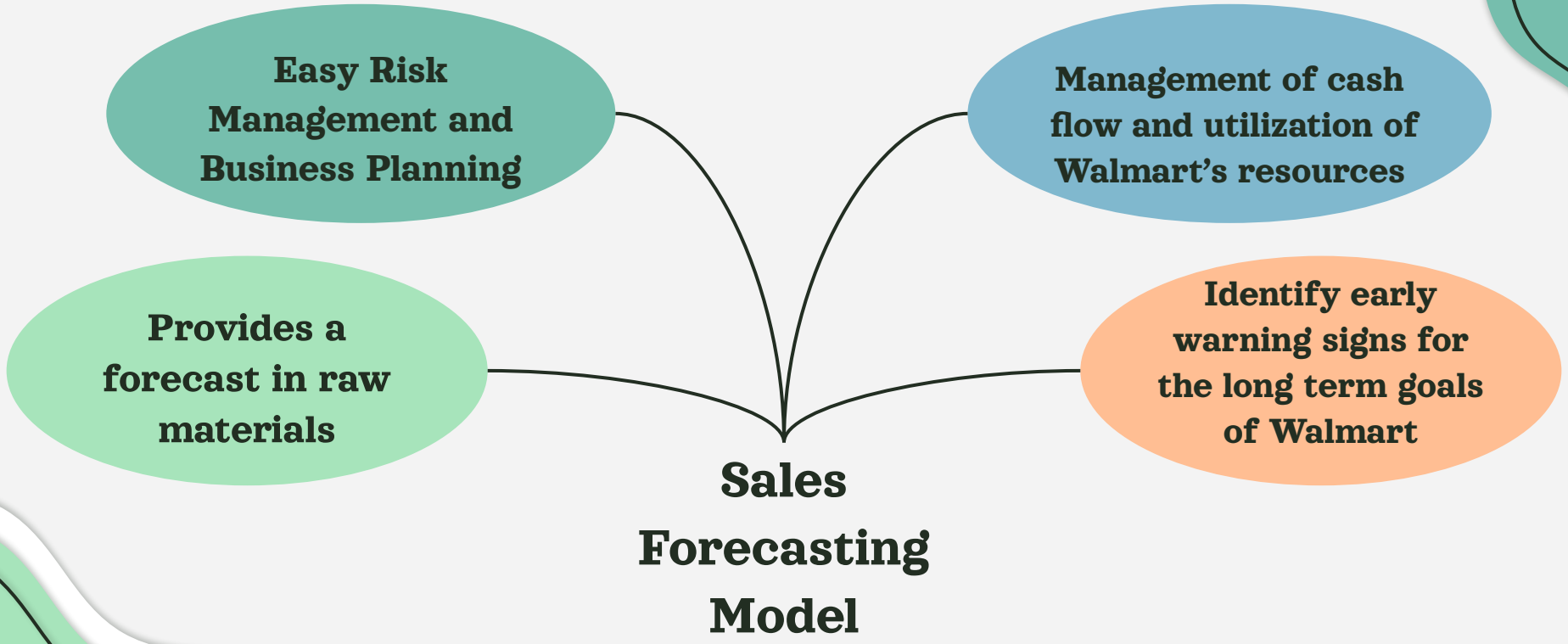

## LIGHT GBM

Based on forecasting accuracy(RMSSE) the best model that we got is LightGBM

# Solution Map



# Unlocking Business Value



# Thank you!

**Do you have any questions?**

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