

E-Commerce Shipping Industry

Project Presentation- 2024

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Project Overview

Leverage on shipping data to;

- Optimize its logistics,
- Enhance customer satisfaction,
- Improve overall operational efficiency

Business Problem

- Limitations of understanding key shipping performance indicators,
- Predicting delivery times accurately,
- Resource optimization



Research Objectives

- Identify the factors influencing shipping delays,
- Identify reliable delivery routes,
- Examine cost effective shipping methods
- Predict future delivery timelines



Key Questions

- What are the main factors contributing to shipping delays?
- How do customer demographics and product preferences influence delivery experiences?
- How can we reduce shipping costs while maintaining or improving service levels?
- How can we predict accurate delivery times?

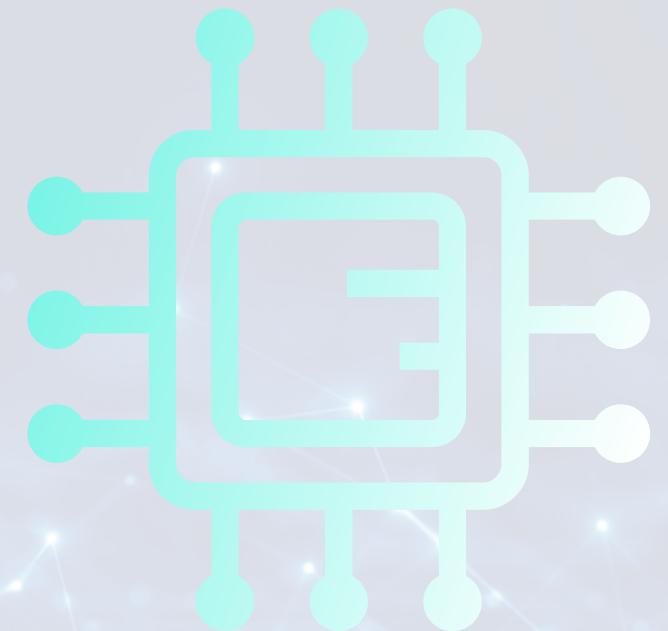


The Data

Data Understanding

E-Commerce Shipping Dataset from Kaggle.com

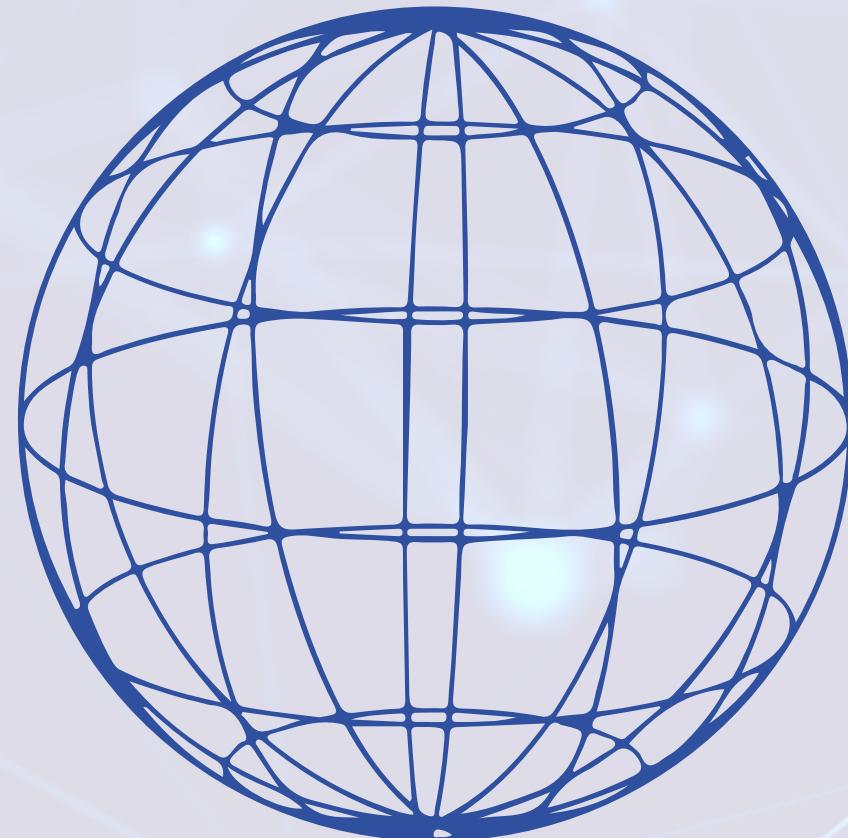
- Contain warehouse blocks, shipping modes, customer ratings and other details



Limitations

- The data lacks demographic details about its users, such as age, gender, or location, making it difficult to identify the audience behind the ratings.
- The data lacks shipping costs to accurately analyze cost effective shipping modes and routes
- It lacks date variable which important in analyzing time series trends
- Outcome of the research is limited to the data extract under analysis

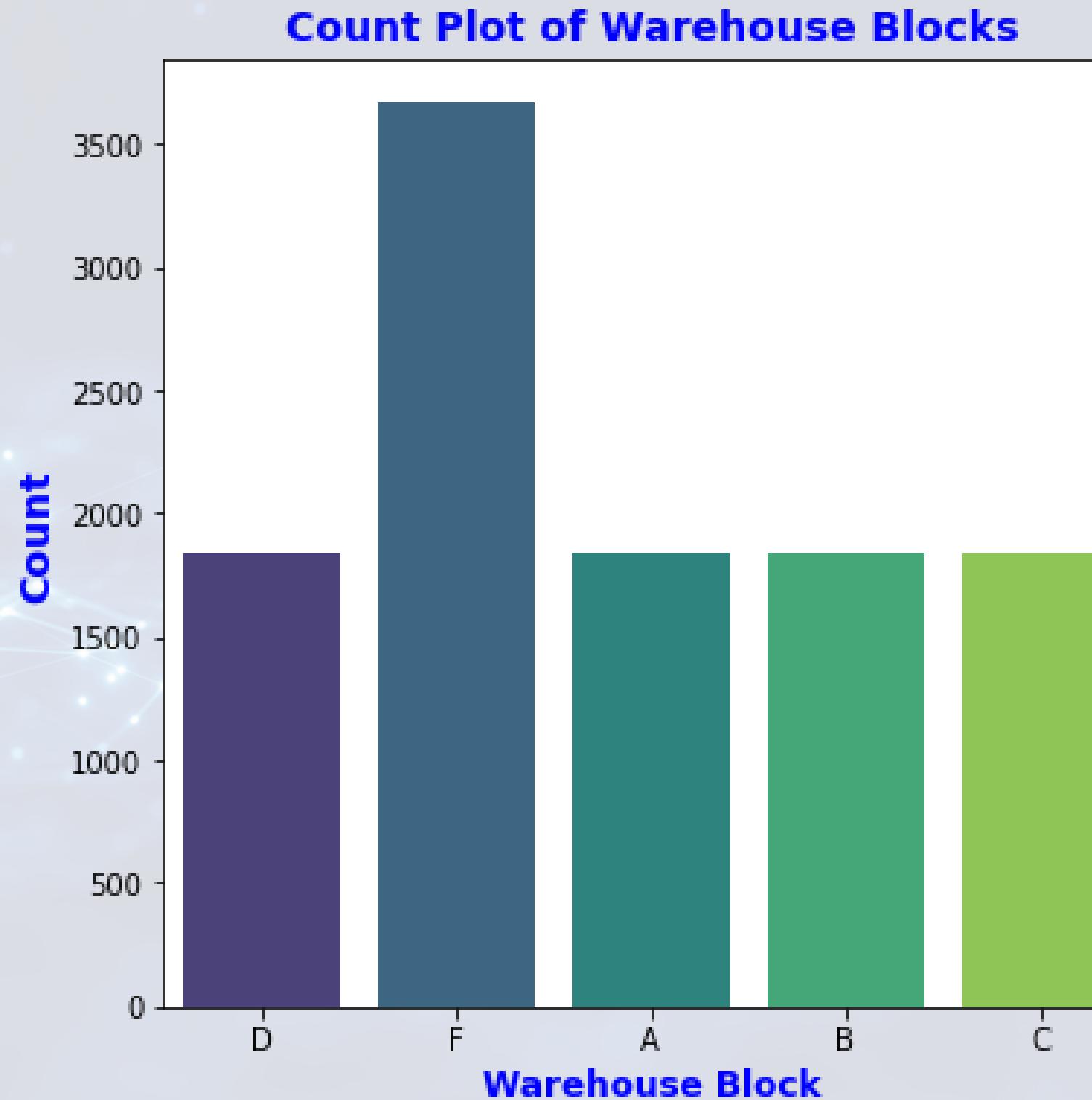
Data Analysis



Data Analysis Approaches:

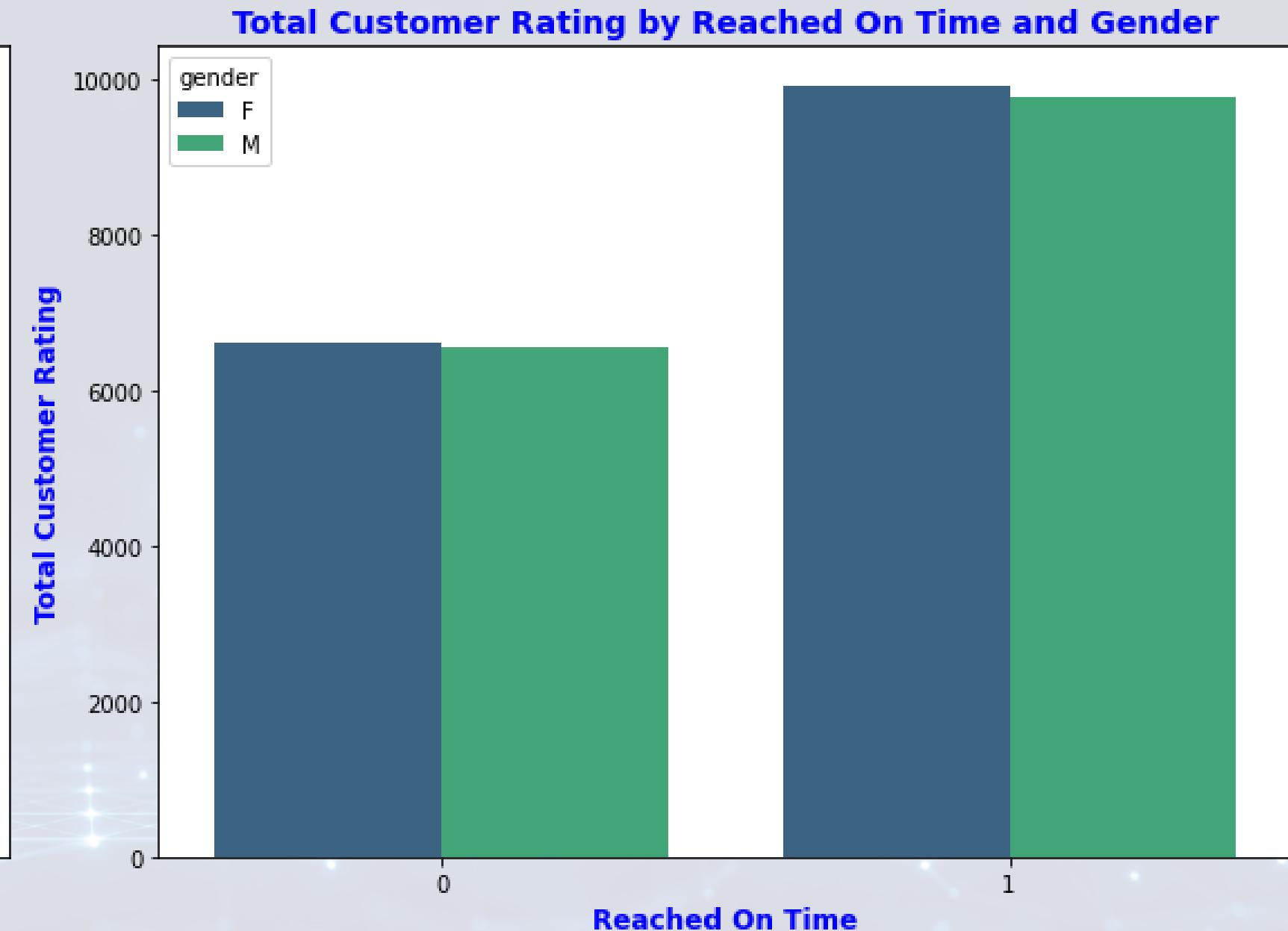
- Univariate Analysis: Understanding single variables distribution.
- Bivariate Analysis: Relationships between gender and ratings/preferences.
- Multivariate Analysis: Combining factors (warehouse_block, cost_per_order and mode of shipment).

Data Visualizations



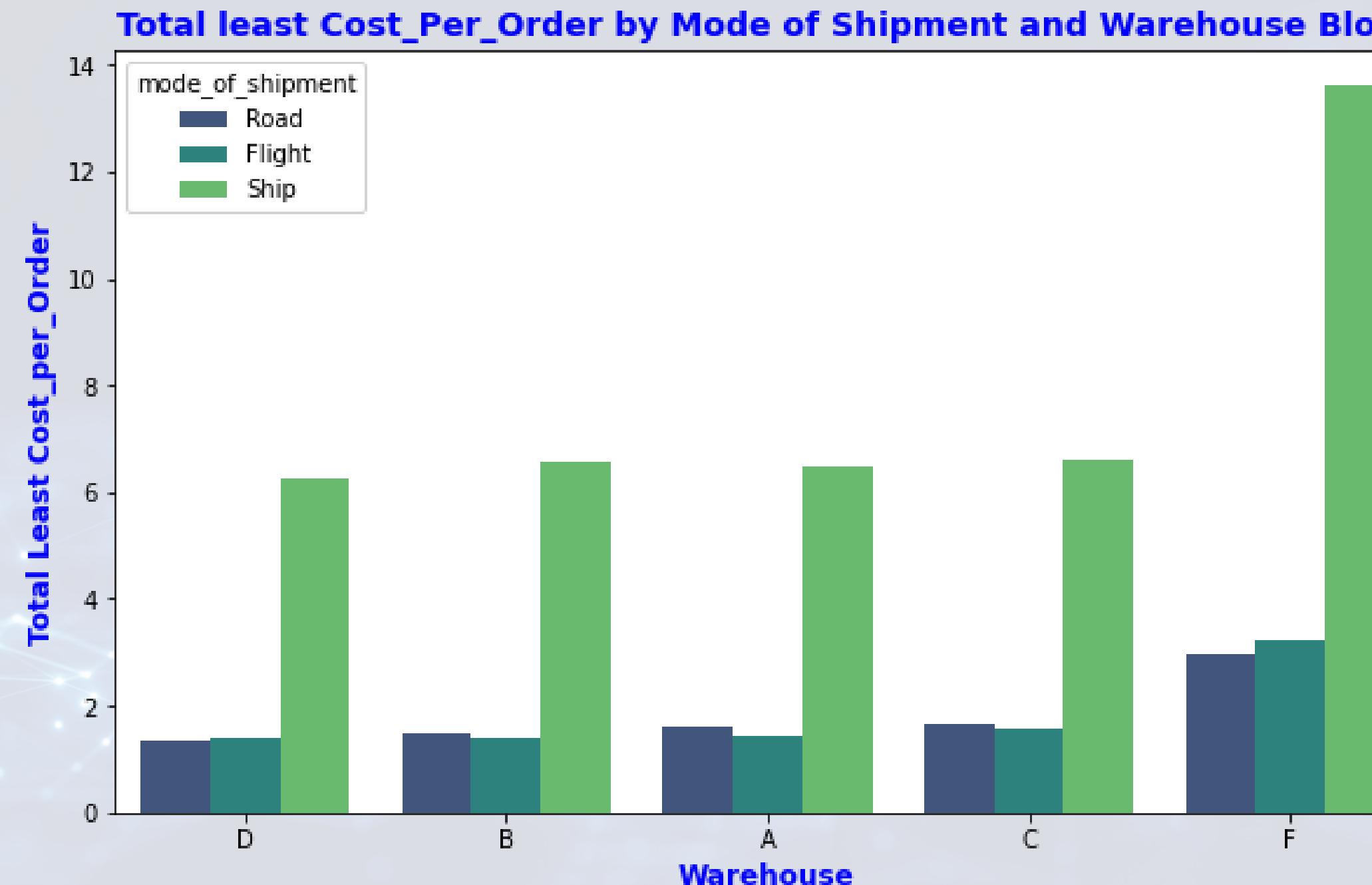
The company dispatches shipments more through block F

Plots of preferences,ratings by gender and delivery time



The higher the customer ratings and prior purchases(product preferences) for both genders led to delivery on time.

Plots of the Total least Cost_Per_Order by Mode of Shipment and Warehouse Block



The top three cost effective routes is shipping through block D by Road, block B by Flight and block D by Flight respectively

Conclusions

Main factors contributing to shipping delays: Warehouse block F, Mode of shipment,- movement of shipment by sea(ship)

Customer demographics and product preferences: Higher customer preference and ratings possibly is as a result of being satisfied with delivery service.

Cost effective shipping mode and routes: Shipment by Road and Flight, top three block D by Road, block B by Flight and block D by Flight respectively.

Best predictive model to deploy: An optimized Decision Tree Classification model

Recommendations

- Optimize warehouse operations especially block F as it is major source of delays
- Improve on performance of sea shipment or explore faster modes like road or air.
- Based on analysis of the data, the company to maintain and expand the most cost effective shipping modes and routes
- Deploy Decision Tree Model to forecast delays and improve on route decisions



Thank You

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