



Vijay Dasan Potty
Noe Mikati
Riley Lenaway
Arjun Prakasan

Captain GPT:

Navigating **Dynamic Pricing** in the Fast-Changing Shipping Industry



Laura Li



Meredith Gao



Andy Sun

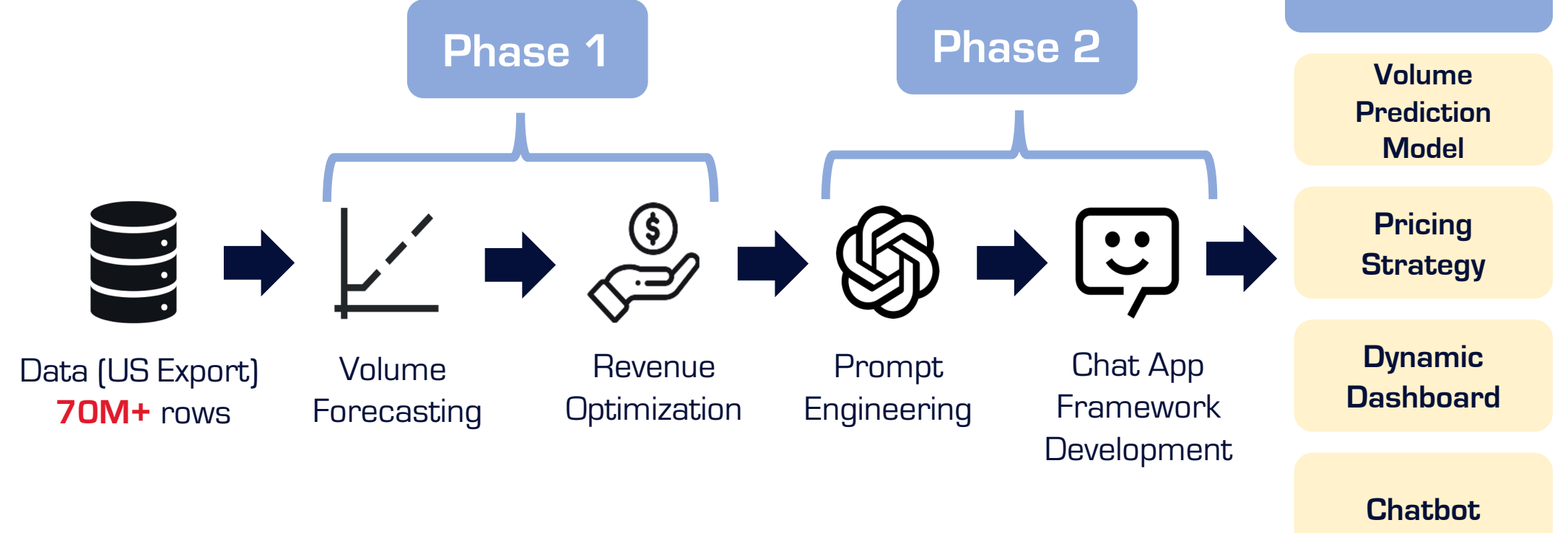
Problem Statement

Motivation: CMA CGM, a global shipping company, traditionally relies on its trade team's **experience** for **pricing** decisions.



Objective: Develop a **mathematical model** to assess the impact of contract price changes on future volume and build an **LLM chat application** for dynamic **pricing** advice.

Project Overview

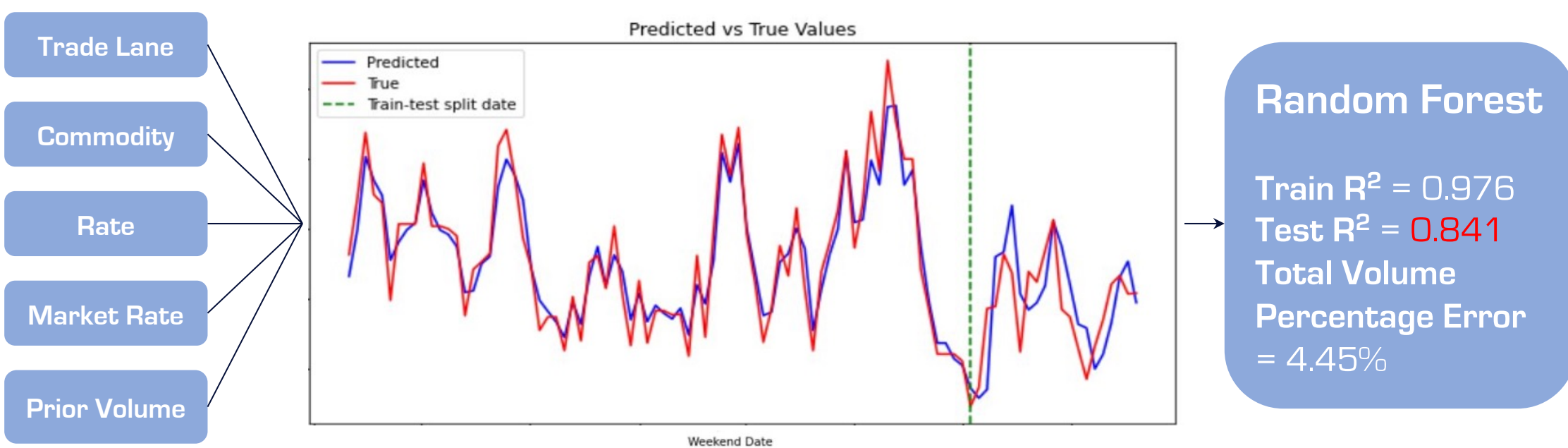


Phase 1

Volume Prediction

Goal: Predict volume for next five weeks
Challenges: Volume and rate patterns differ significantly among different customers, commodities, trade lanes, container sizes, etc.

Forecast at **trade lane, container size, and commodity** level
One model per **customer**



Price Elasticity & Revenue Optimization

Customer: XYZ
Group: LA to Shanghai, 40-foot container, all kinds of commodity
Projecting Period: next week

Simulated Rate Range:
• 700
• 750
• ...

Predicted Volumes from Random Forest:
• 700 - 60
• 750 - 40
• ...

Volume - Rate Plot

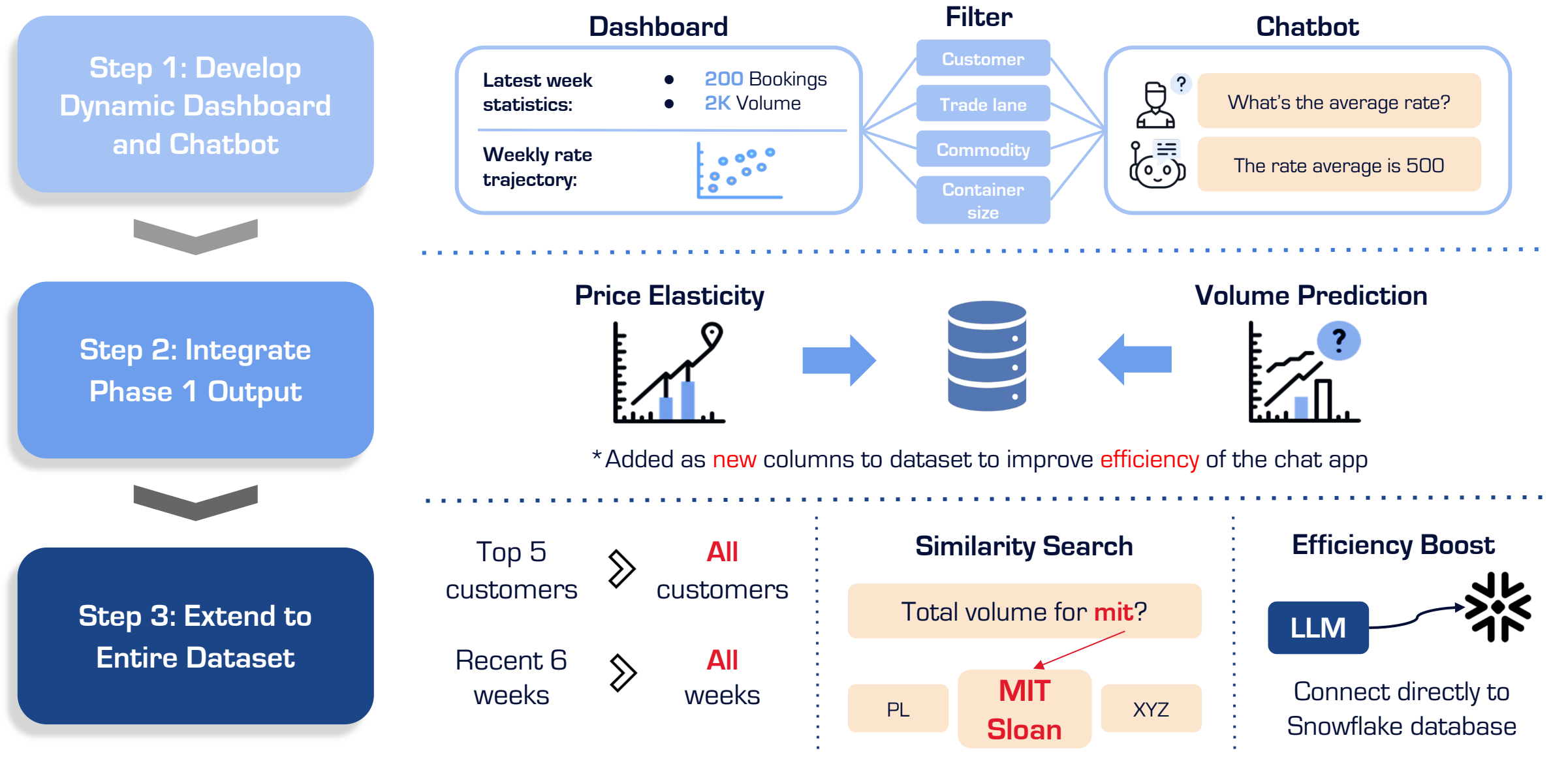
Q: How to measure impact of rate change on volume?
A: Use **slope** from Linear Regression to estimate **price elasticity** from simulated rates and volume predictions

Q: What's the optimal rate to recommend?
A: Calculate **revenue** for each (rate, volume) pair to find the **optimal** rate

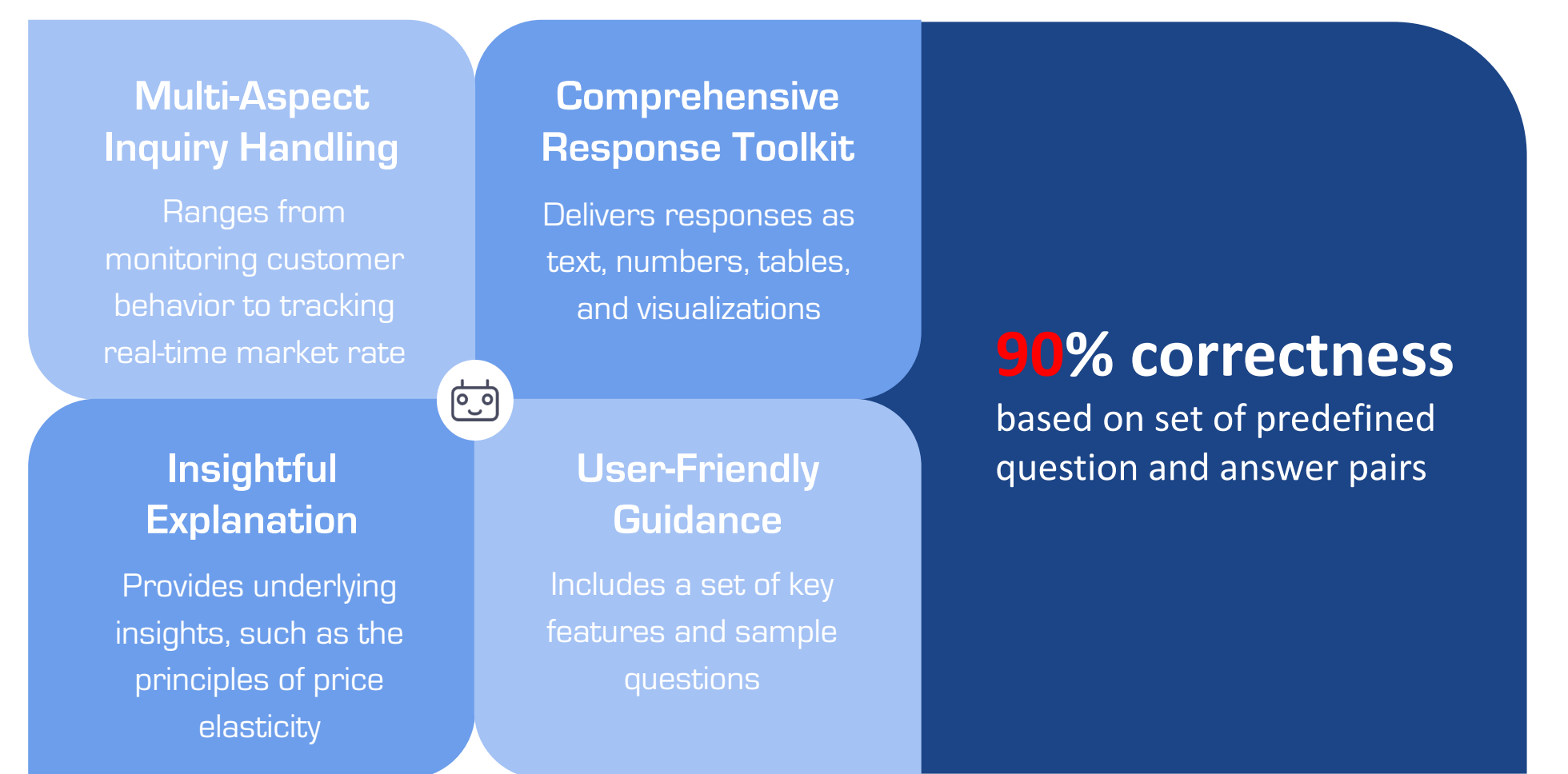


Phase 2

Chat App Development

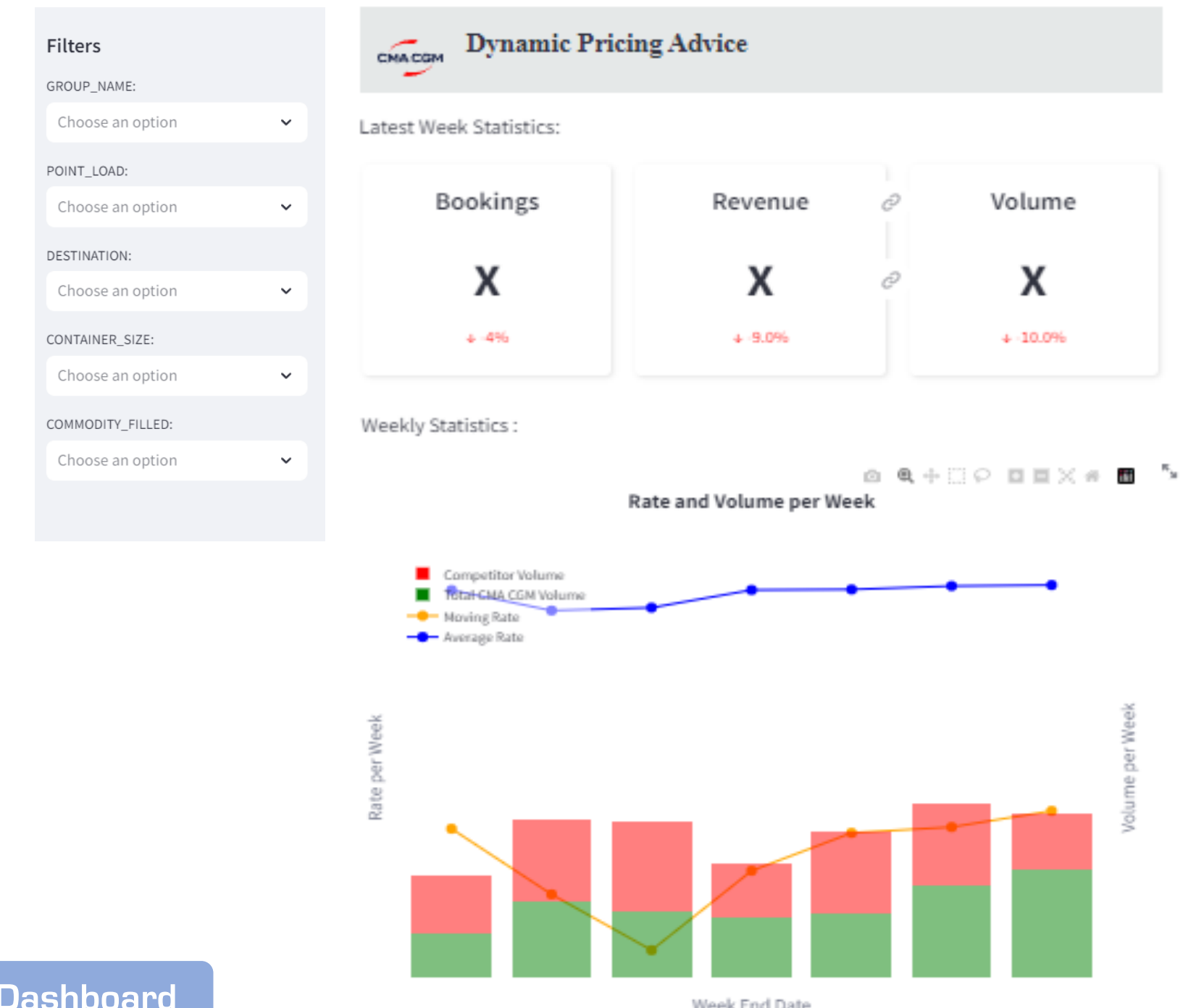


Chat App Functionality



Results

Web App Interface



Dynamic Pricing Advice Assistant

Hi! Here are some things you can ask me about this dataset:

- Rate:** What is the average rate for shipments from New York to Rotterdam for 40-foot containers?
- Market Rate:** Find the top 3 destinations with the highest average moving rate for shipments from any US port in Jan 2024.
- Volume and Revenue:** What is the total revenue and volume for 40 containers shipped from any US port to China for the latest week?
- Market Share:** Which tradelane has the highest average market share?
- Price Elasticity:** What is the price elasticity for company A 40 foot container shipments from USHOU to HTPAP?
- Predicted Volume for next 5 weeks:** Can you show the total predicted volumes for all destinations from Los Angeles for the third week of predictions?
- Visualization:** Can you show a line chart of the total volumes for each weekend date?

Chatbot: Which customers have average moving rate in the top 50 percentile and average market share in the bottom 50 percentile? Can you show a line chart of the total volumes for each weekend date?

See SQL Query: [Query input field]

See Python Code: [Code input field]

Total TEU Utilisation Over Time: [Line chart showing TEU utilisation over time]

Explanation: The result shows that Customer A and Customer B are the ones who have an average moving rate in the top 50 percentile and average market share in the bottom 50 percentile.

Impact

- Dynamic Pricing Advice Chatbot:** Enhance market **responsiveness** and decision-making **accuracy** validated by empirical data.
- Ready-to-Use Data Pipeline and Dashboard:** Enable real-time analytics and operational **efficiency**.
- Optimization and Prediction Model:** Increase potential **revenue**, monitor customer shipping behavior, and improve market **competitiveness**.