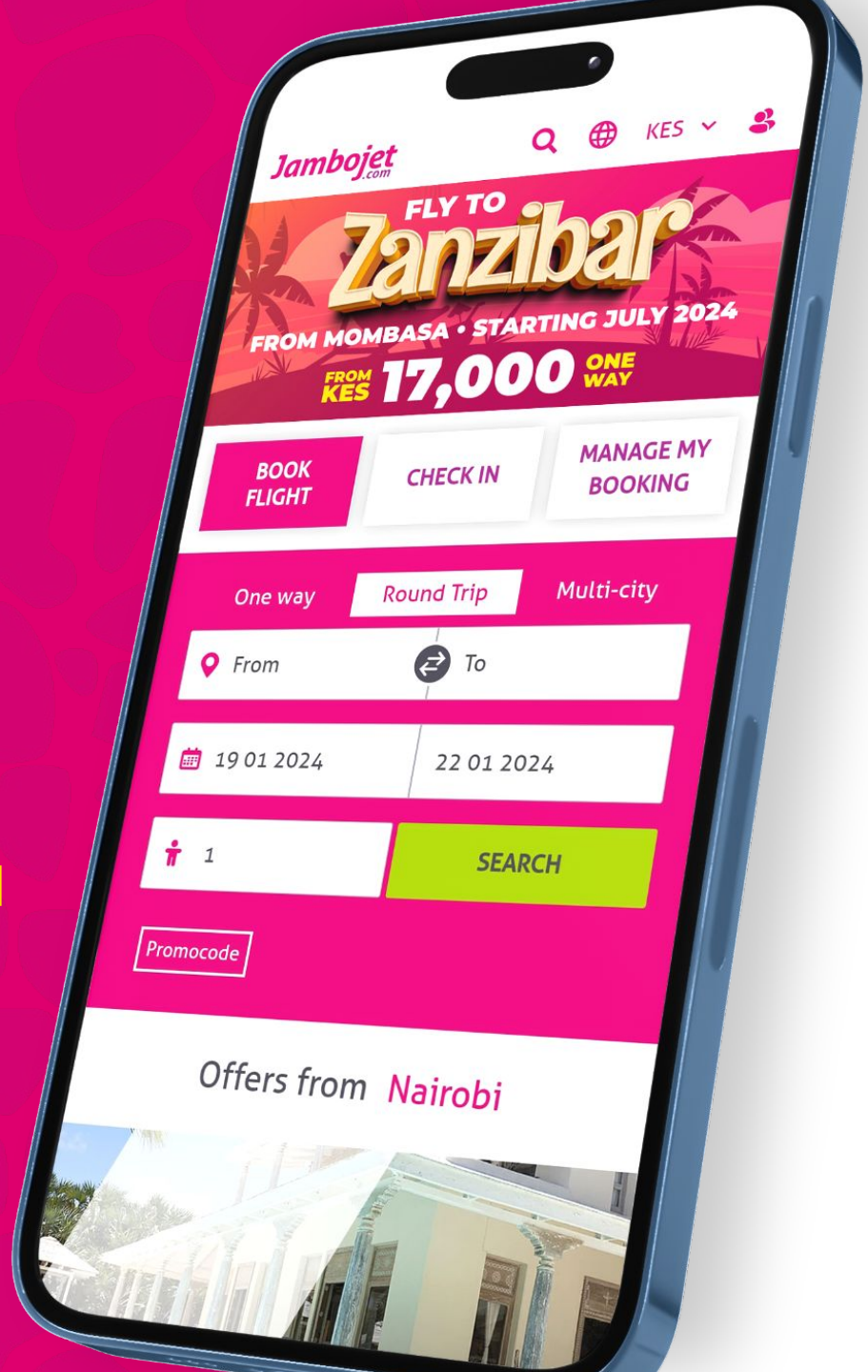
Jambojet.com

Web Traffic Prediction for Enhanced Revenue.

By: Mwenda Mugambi | Frank Kiptoo | Yvonne Kamari | Julliet Iswana | Sylvester Magunda | Trevor Mwangi



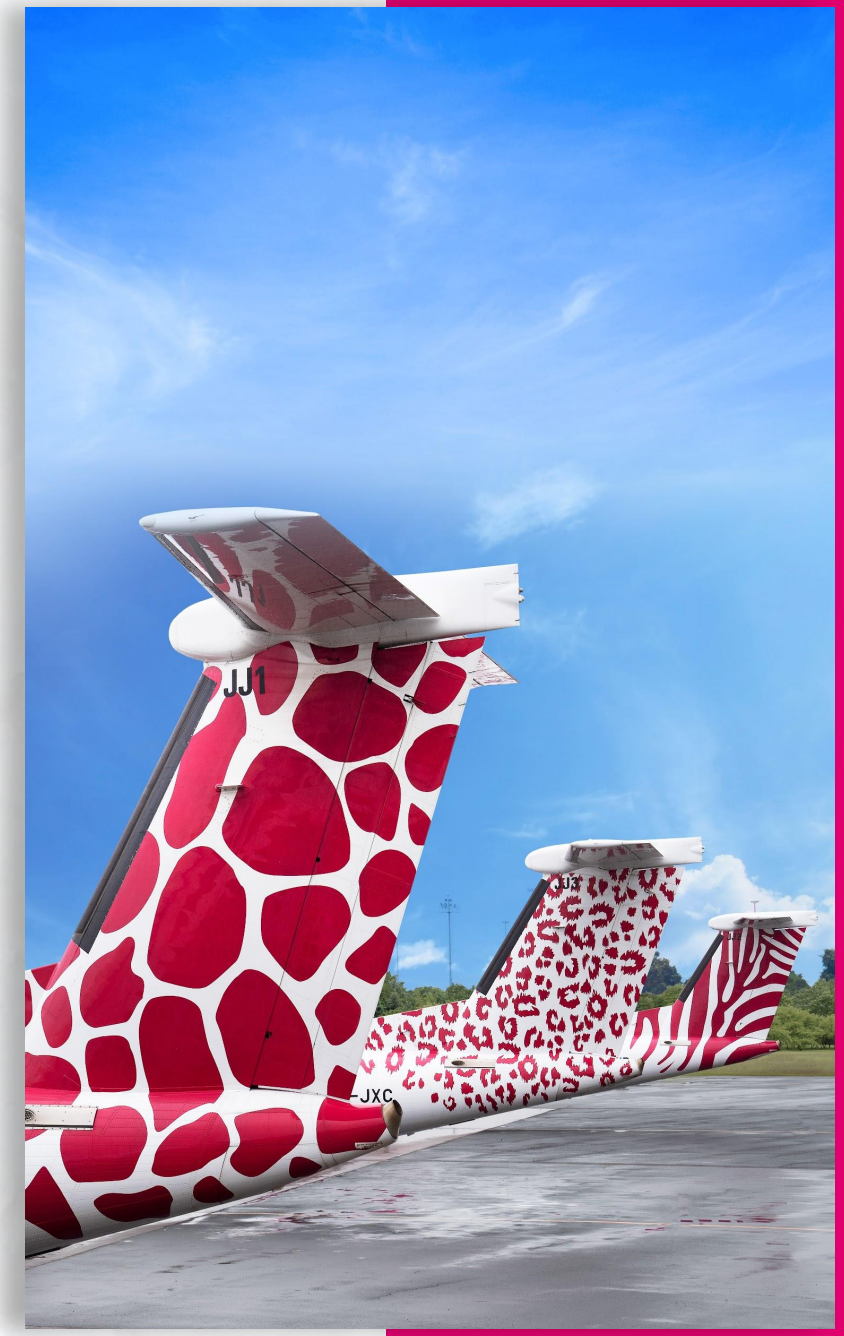
Industry Background

The need for diversification

Although the **COVID-19 pandemic hit airlines harder than any other aviation subsector,** it wasn't doing particularly well before then. From 2012 to 2019, despite a favorable environment of strong economic growth and low fuel prices, airlines were bleeding $17 billion in economic profit a year, on average. Of the 122 carriers we studied, 77 percent were value destroyers (Exhibit 3). But the average losses of airlines before the pandemic were only around one-tenth of their $168 billion in losses for 2020.

Their **revenues plummeted by 55 percent, setting the subsector back, in nominal terms, roughly 16 years—to 2004.**

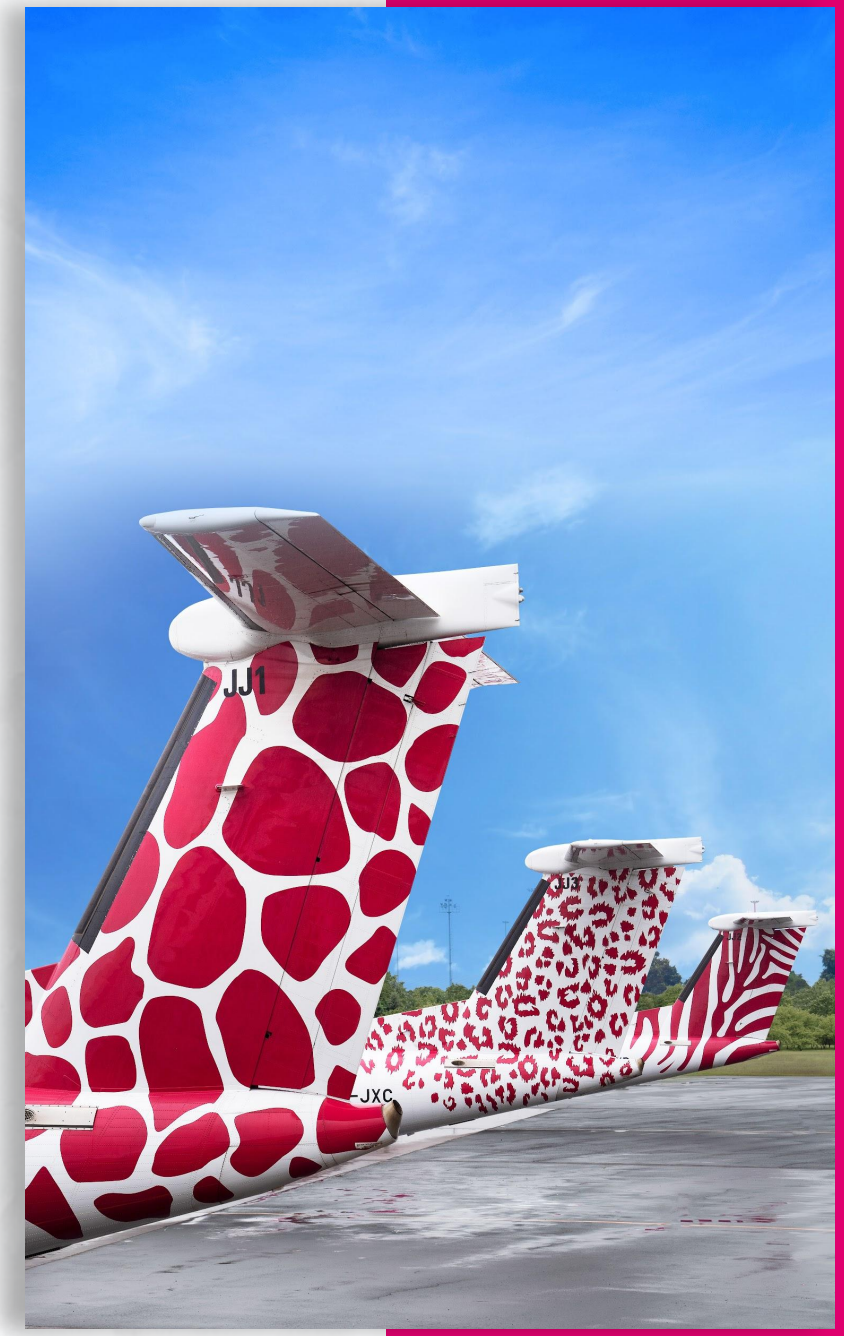
Source



Business Overview

Leading Low-Cost Airline in East Africa.

- **Key Strength:** Preferred choice for cost-conscious travelers, emphasizing in the East African region.
- **Market Position:** Dominant player in the aviation industry, known for budget-friendly and reliable air travel. with a **Market Share** of **54+%** in domestic air travel.
- **Diversification: Launched advertising product in 2018,** leveraging their high-traffic website to boost revenue and advertiser satisfaction.



Problem Statement and Project Objectives

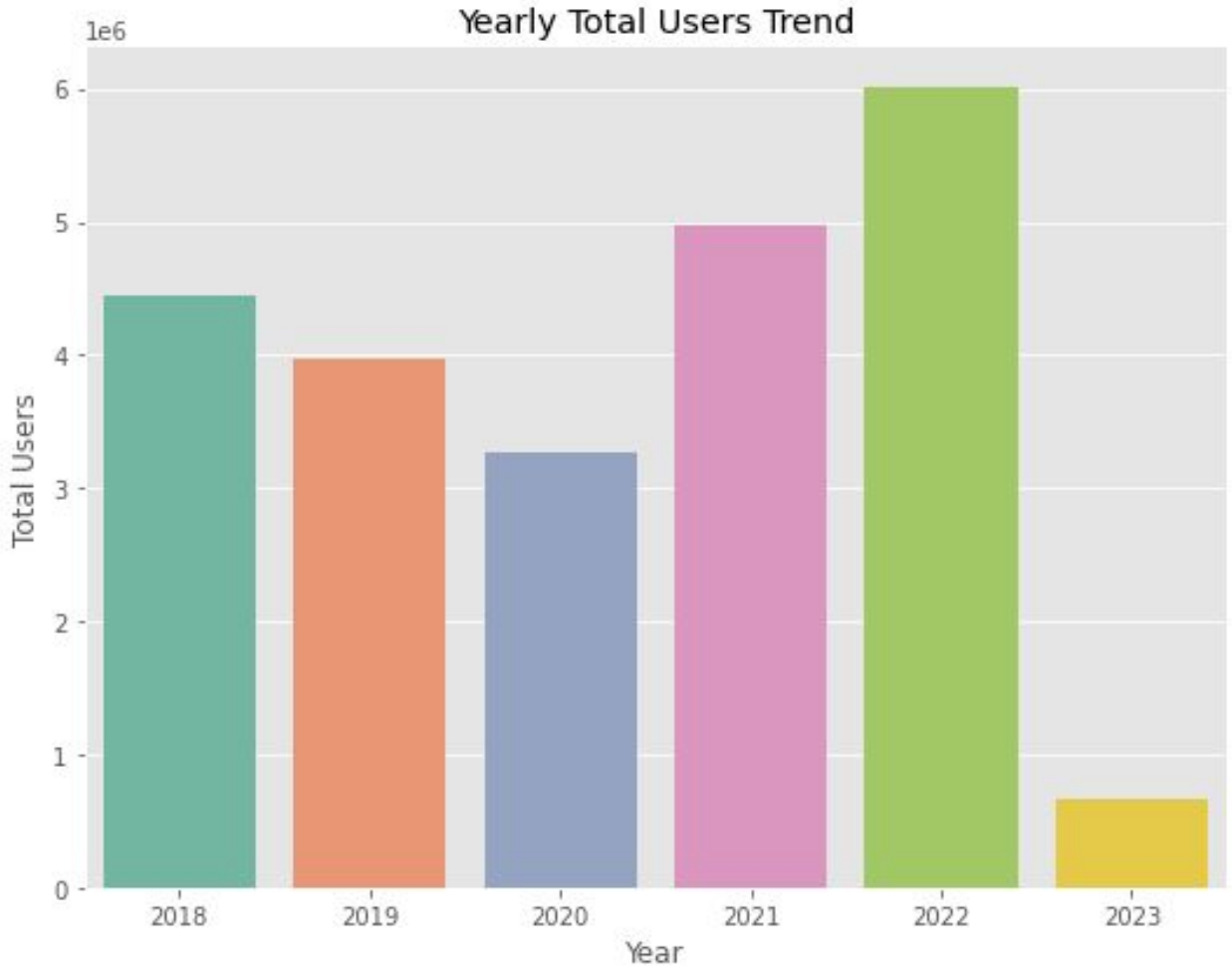
Jambojet seeks to maximize revenue and improve advertiser satisfaction by optimizing ad spaces.

- This project focuses on revolutionizing ad space revenue collection through **Advanced Time Series Forecasting.**
- This approach will enhance Jambojet's platform competitiveness and contribute to the broader industry shift towards **efficient online advertising solutions.**

Data Collection and Understanding

- The dataset used simulates the web traffic behaviors of websites such as www.jambojet.com. real-time time series data can be scrapped from **Google Analytics**
- It considers their **marketing campaigns, travel restrictions,** and other industry factors that may influence web traffic.
- The dataset consists of **total users** ('Simulated_Users') and **new users** ('Simulated_New_Users') per day, sourced from Google Analytics.
- It captures daily fluctuations in user engagement, essential for precise forecasting and ad optimization.

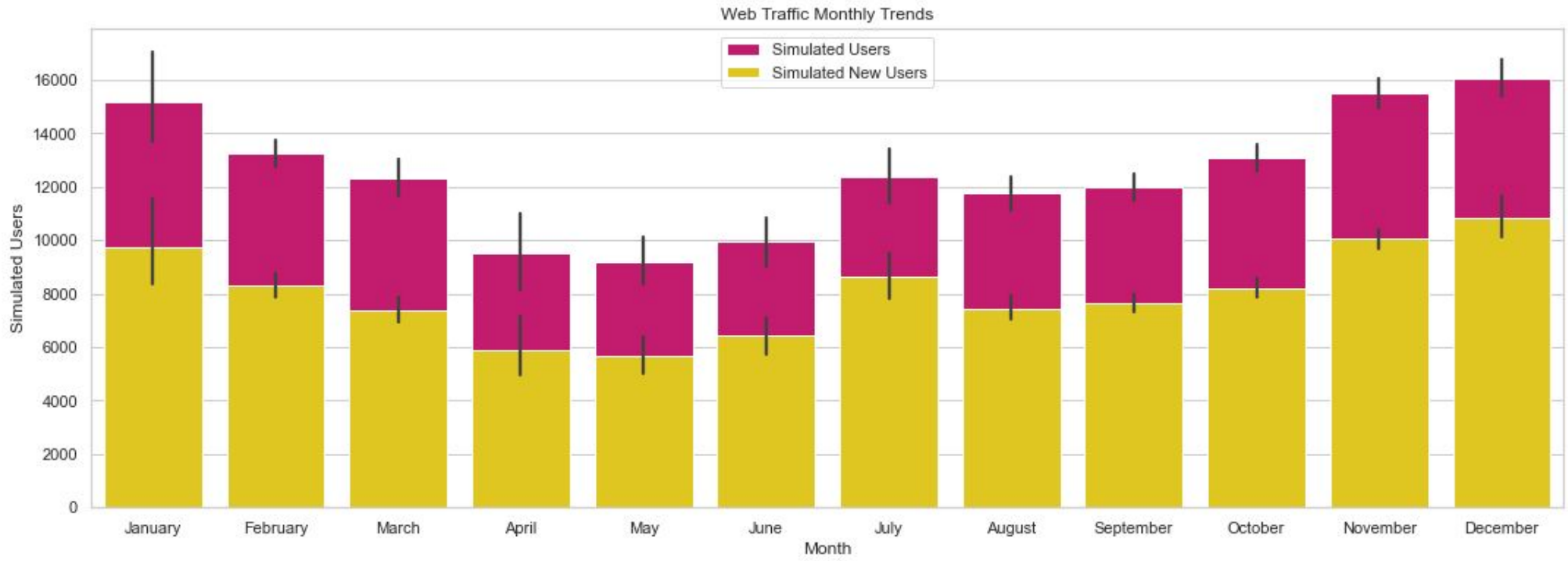
Data Analysis



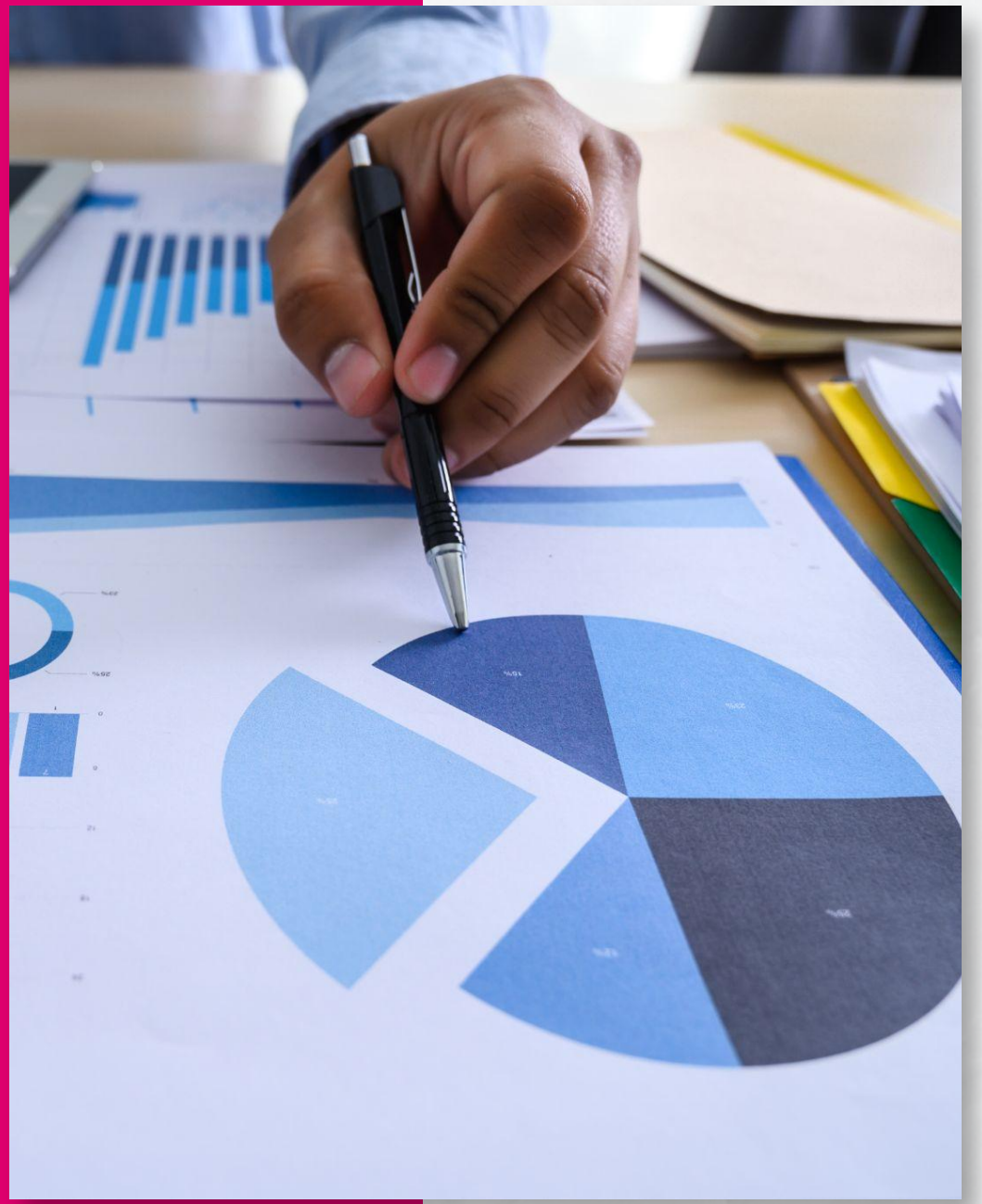
Yearly Analysis

Yearly trends show fluctuations in **total users** which were influenced by various factors including **marketing campaigns** and the **COVID-19 pandemic** with 2022 recording the highest traffic.

Monthly Analysis



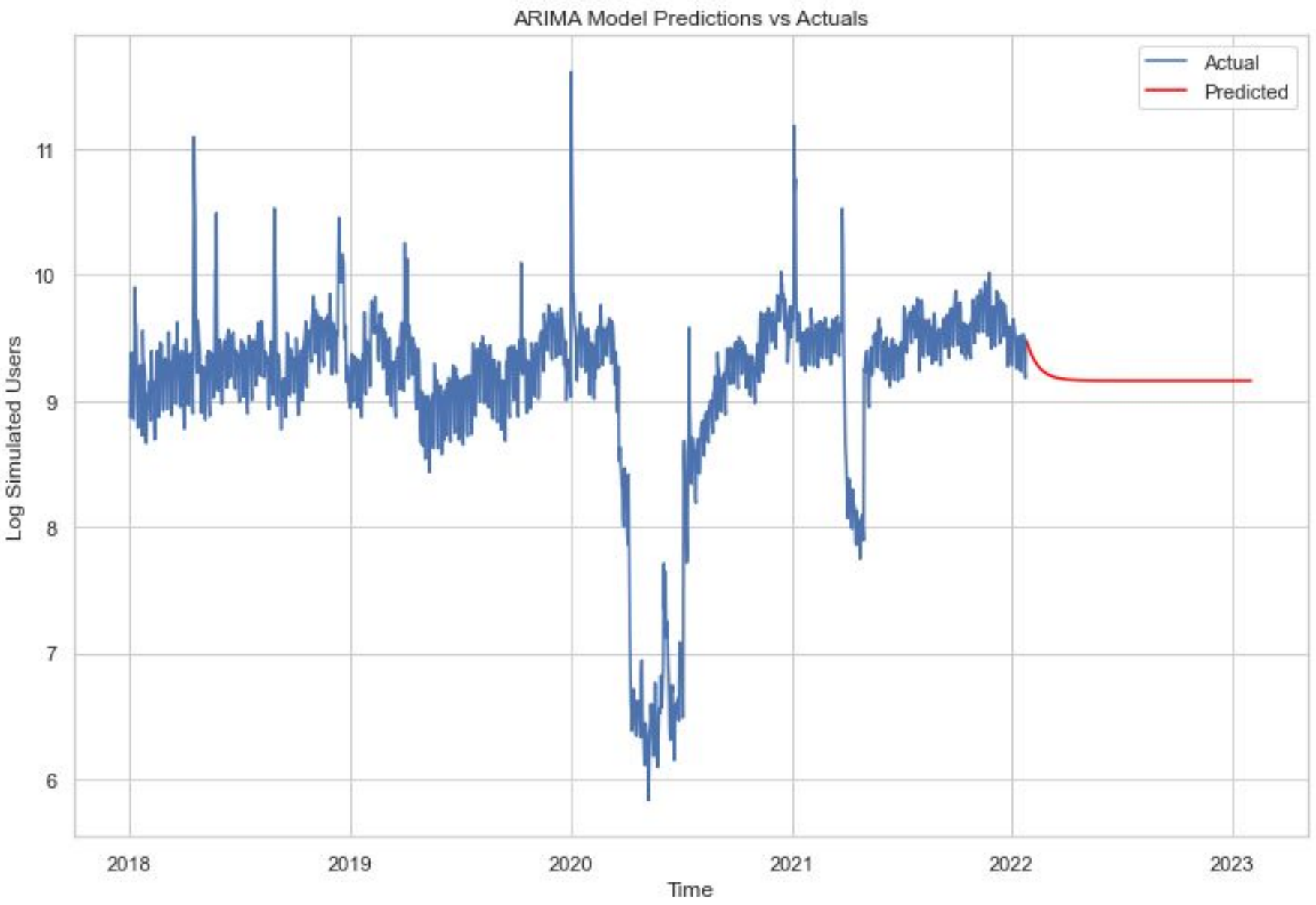
Monthly trends show fluctuations in **user traffic** throughout the months with **December recording the highest traffic** and **May recording the lowest**



Modeling Success Criteria

- **Root Mean Squared Error (RMSE)** is used to evaluate the accuracy of our time series forecasting models, specifically focusing on predicting daily total users.

Baseline Model

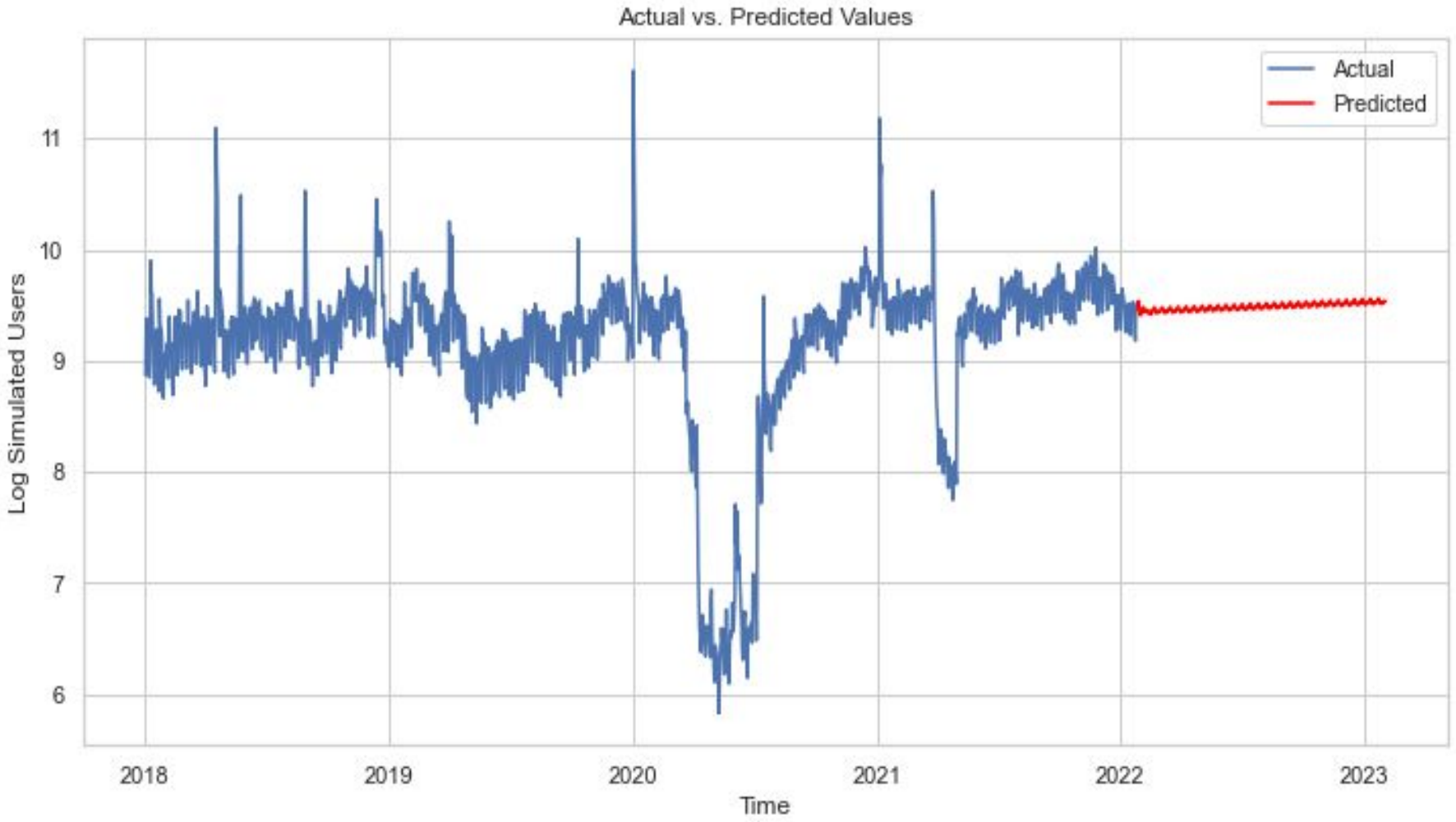


Arima Model:

RMSE: 0.5976628

The RMSE is relatively low, but not the lowest among the models presented.

Model 4

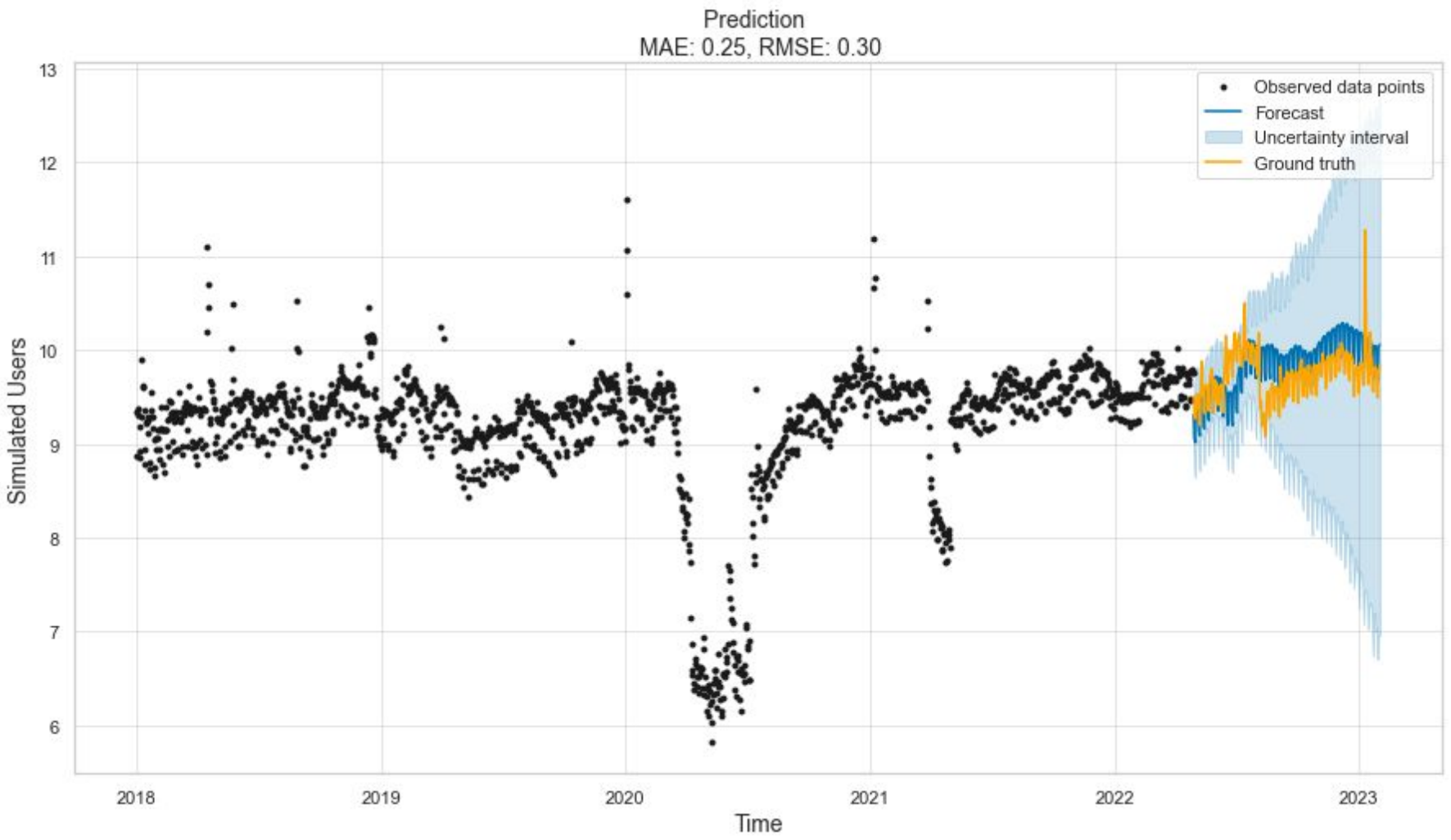


Sarima Model:
RMSE: 0.327229

This model is a SARIMA model, which extends ARIMA by adding seasonal components.

The RMSE for this model is lower suggesting that the model is a good fit to the data.

Best Performing Model



Facebook Prophet:
RMSE: 0.2965632

This is a an open-source forecasting tool developed by **Facebook's Core Data Science team.**

The RMSE is the lowest of the other models suggesting that it had the best fit to the data.

Conclusion

In conclusion, the evaluation of the different time series models applied to the dataset provides valuable insights into their performance.

- **While the PMDARIMA model (Model 3) offers a competitive RMSE close to that of SARIMA,** its advantage lies in the automatic selection of model parameters, showcasing the effectiveness of the pmdarima package. **The ARIMA models (Models 1 and 2)** also provide reasonable predictive capabilities, with Model 2, incorporating differencing, outperforming Model 1.

- Considering the RMSE values, the **Facebook Prophet model (Model 5)** stands out as the most accurate among the evaluated models. **Its lower RMSE suggests that Prophet is well-suited** for forecasting the simulated user data in this particular scenario. It outperforms the traditional ARIMA and SARIMA models, as well as the auto_arima approach.

Recommendations

1. **Facebook Prophet Model for Forecasting:**

- Implement the Facebook Prophet model for accurate web traffic predictions.
- Use forecasts to identify peak traffic periods for dynamic ad placement and pricing.

2. **Marketing and Communication Strategy:**

- Align marketing with Jambojet's event calendar, focusing on peak travel times and holidays.
- Plan campaigns in advance to build anticipation.
- Use social media and email marketing for promoting deals during low seasons.

3. **Promotion and Event-Driven Marketing:**

- Coordinate ad campaigns with peak travel periods and promotional events.
- Partner with tourism boards and travel agencies for joint promotions.
- Use real-time marketing strategies during high traffic periods.

4. **Segmentation and Targeted Advertising:**

- Analyze different user segments for tailored advertising.
- Offer personalized promotions, like targeting international travelers during winter.

Cont..

5. **Dynamic Ad Space Pricing:**
   - Adopt a dynamic pricing strategy based on seasonality trends.
6. **Advertiser Dashboard and Real-Time Insights:**
   - Introduce a dashboard for real-time ad performance and web traffic insights.
   - Allow advertisers to adjust campaigns based on data-driven insights.
7. **Enhancing User Experience:**
   - Optimize the website for peak traffic times to prevent slowdowns.
   - Incorporate user feedback for continual improvement.
8. **Response to External Factors:**
   - Monitor external factors impacting web traffic.
   - Develop contingency plans for unexpected travel pattern changes due to global events.

THANK YOU

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