

AUTOMOTIVE E-COMMERCE ANALYTICS

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INTERNSHIP CASE STUDY - DECEMBER 2024



THE ANALYSIS

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Today, I will present the key insights I discovered while analyzing the data for this case study.

Here's an overview of what I'll cover:

- Key growth strategies
- Graph Analysis
- Applications of Machine Learning
- Conclusions and Takeaways



KEY GROWTH STRATEGIES

01

Improve dealership experience in summer and autumn.

02

Run cost-effective ads to grow website users and trust.

03

Boost mobile app usage and engagement.



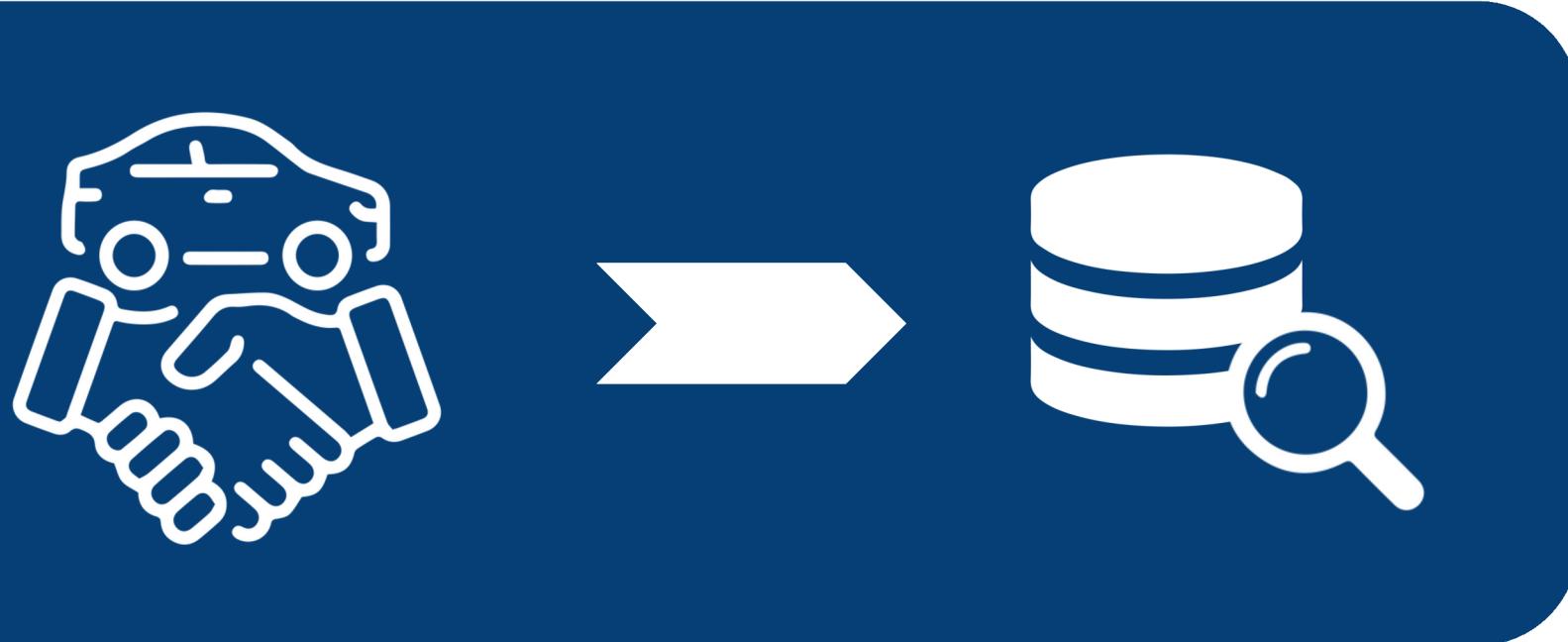
03

01

IMPROVE DEALERSHIP EXPERIENCE IN SUMMER AND AUTUMN.

Analyzing the available data, I noticed the presence of some anomalies in the reviews left by customers about the dealership.

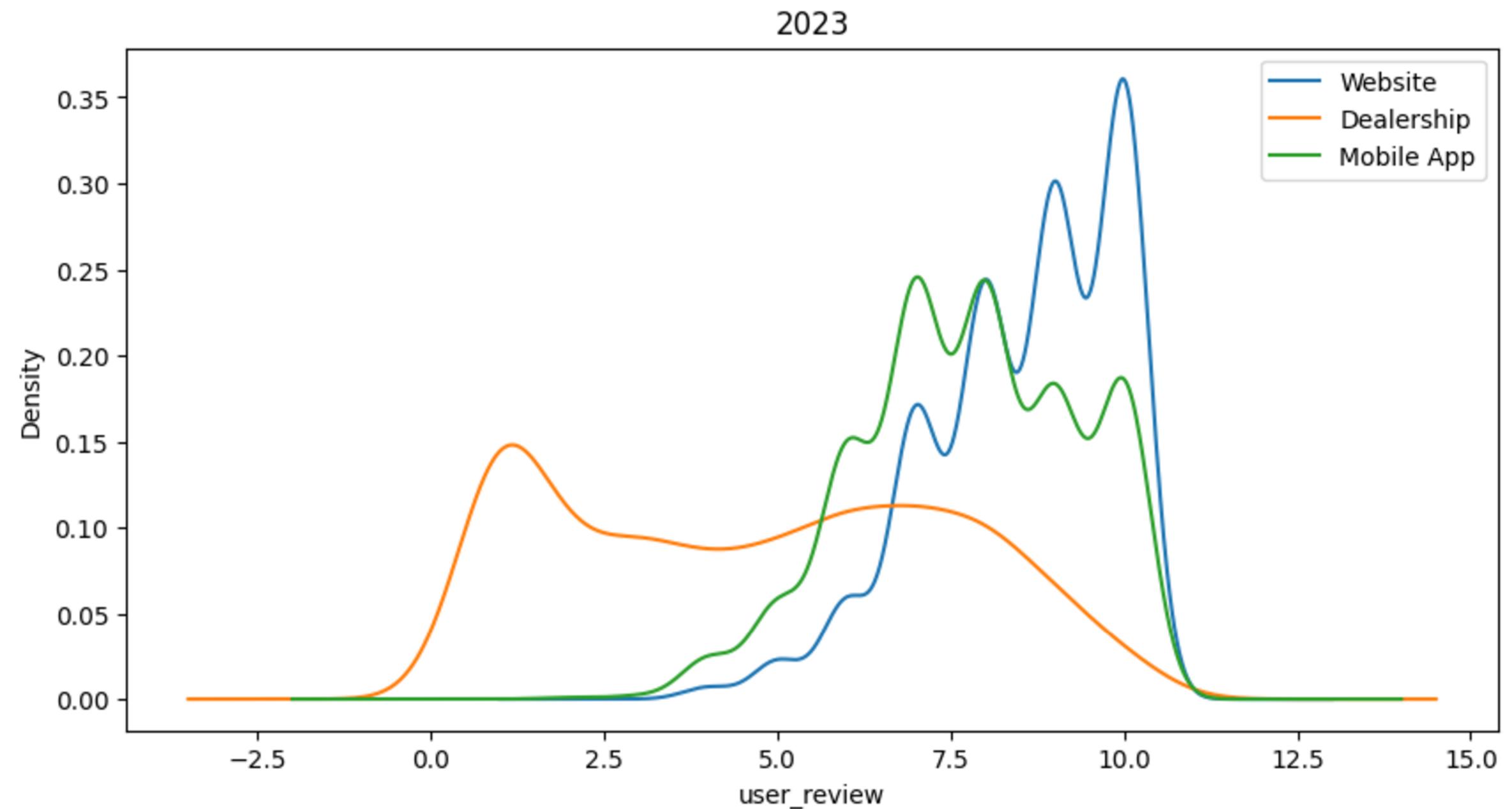
Let's take a closer look at what I found.



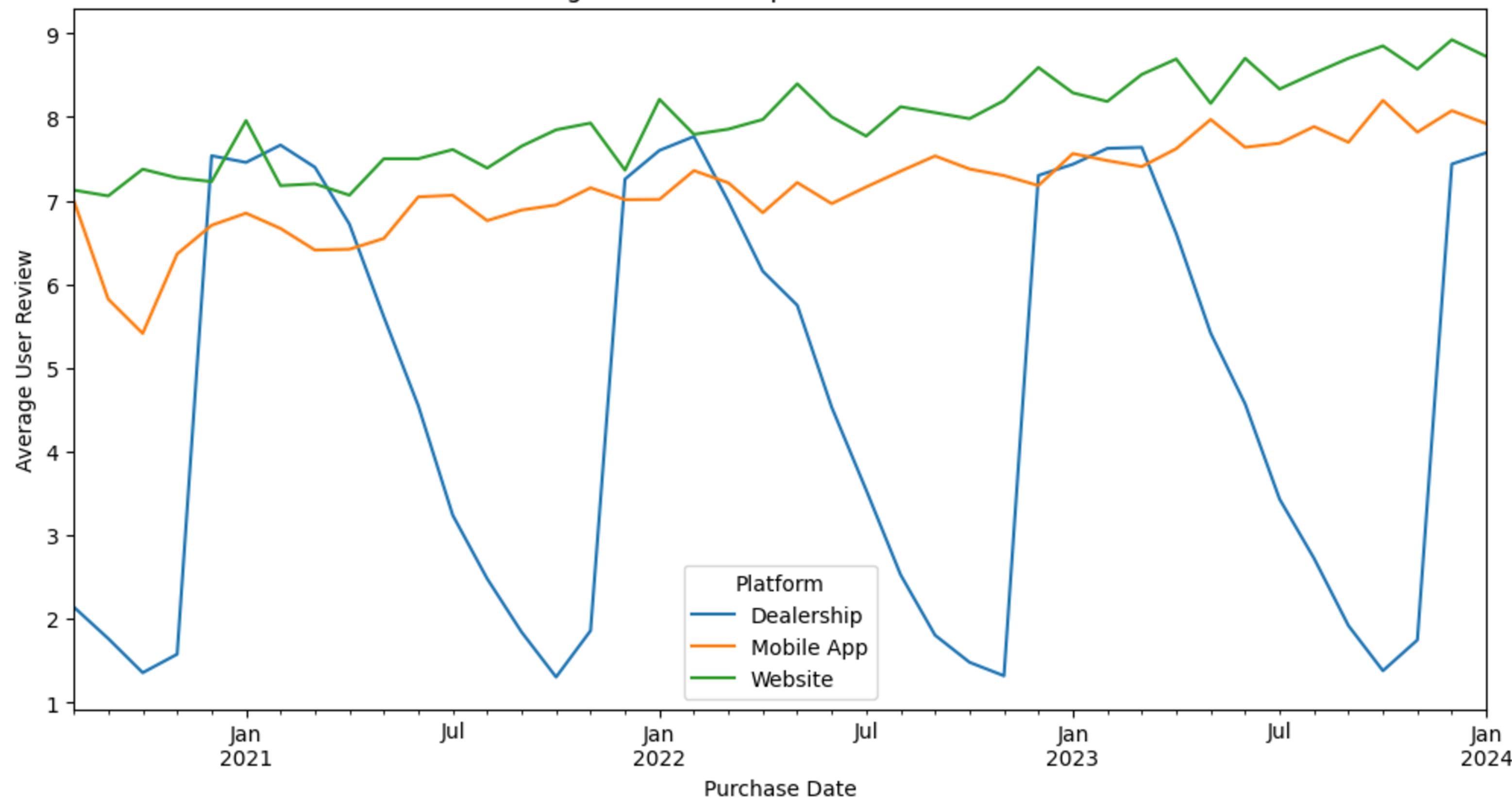
USER REVIEW DISTRIBUTION FOR EACH PLATFORM

Here we can observe that the average reviews throughout the year are **highly positive** for both the website and the mobile app.

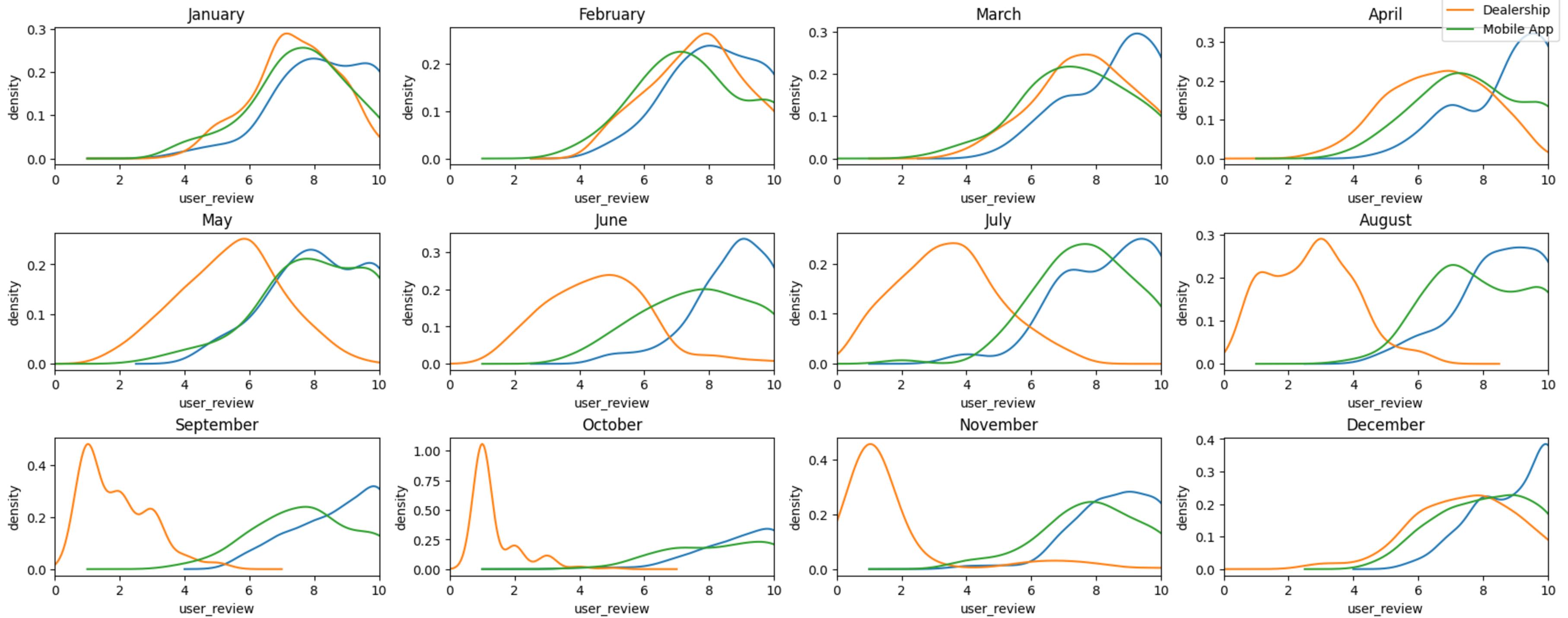
However, there appears to be an **issue with the dealership**, as its reviews are significantly lower.



Average User Review per Platform Over Time

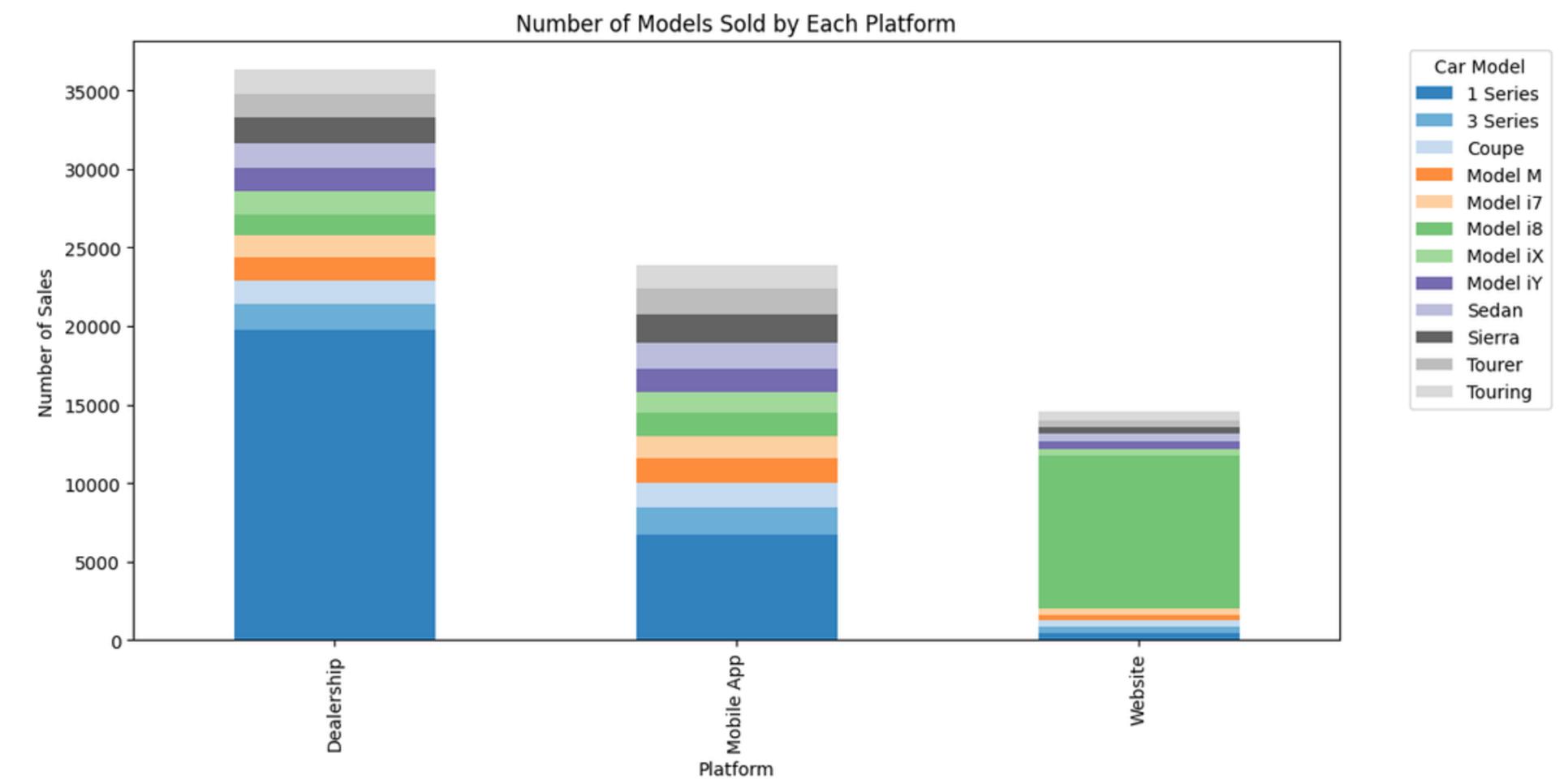
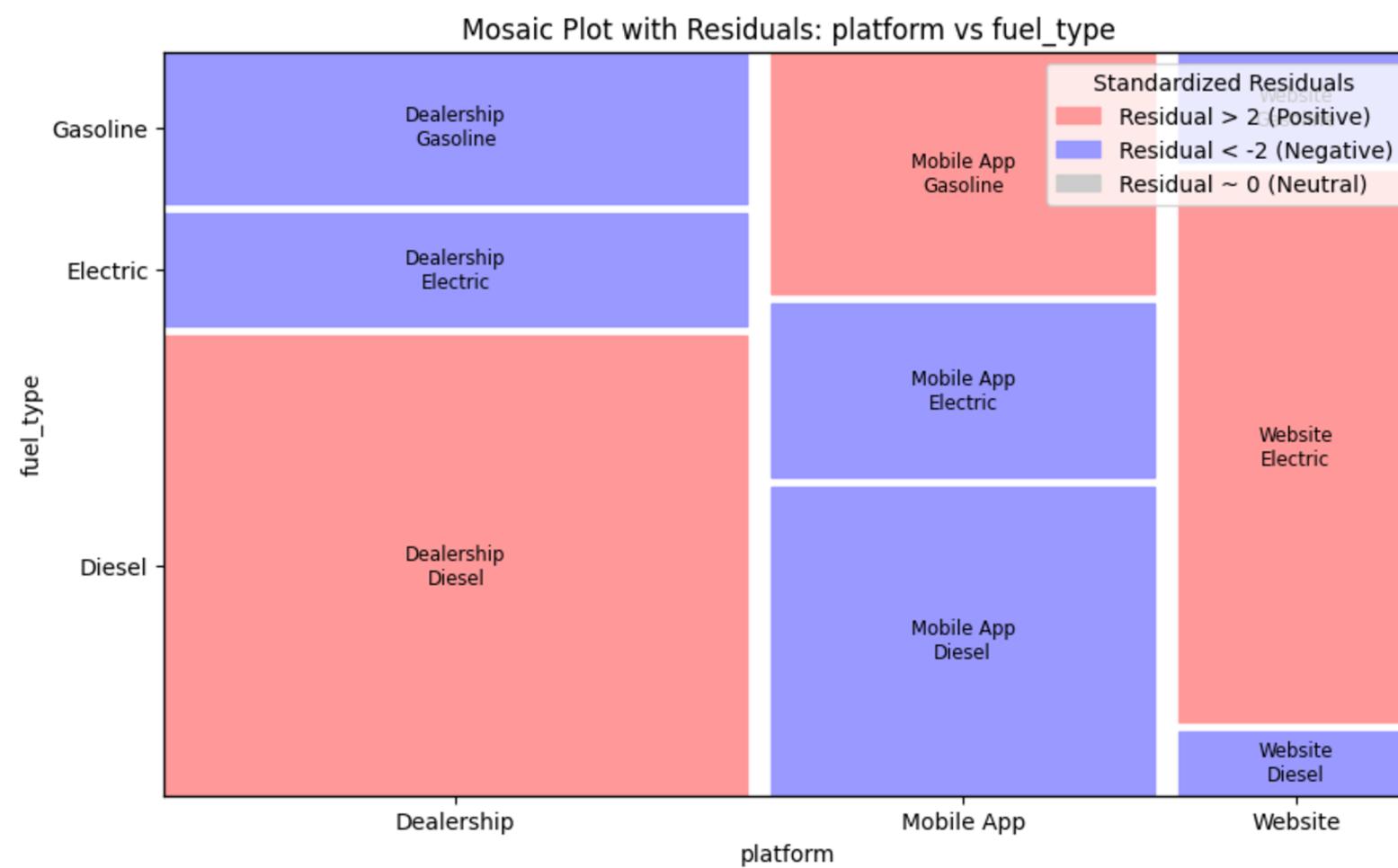


User Review Distribution Colored by Platform - 2023



The problem might be caused
by vacations or other disruptions that can occur
during the summer and autumn periods.

This affects
the majority of customers who purchase
economical, diesel cars.



02

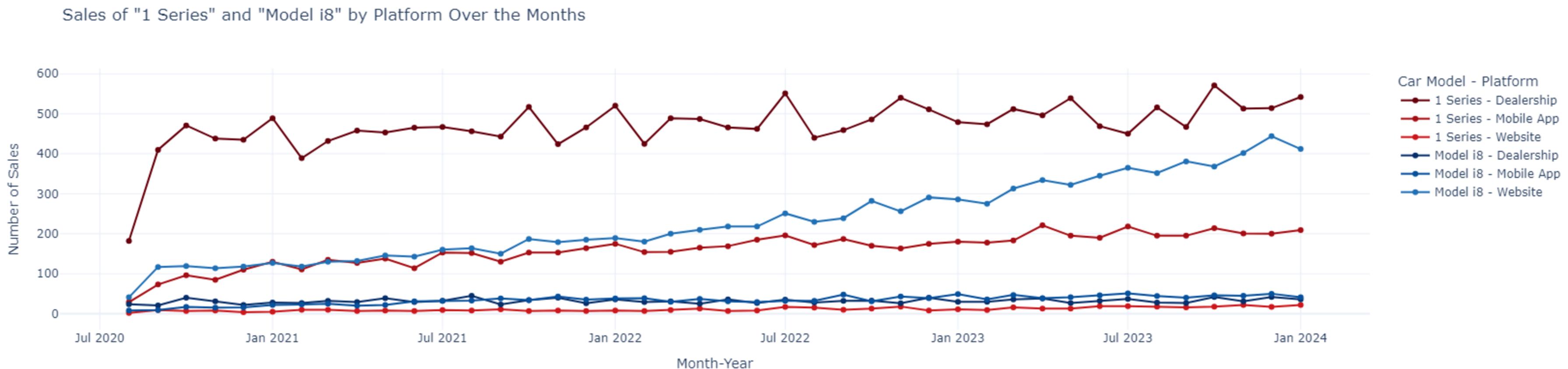
RUN COST-EFFECTIVE ADS TO GROW WEBSITE USERS AND TRUST.



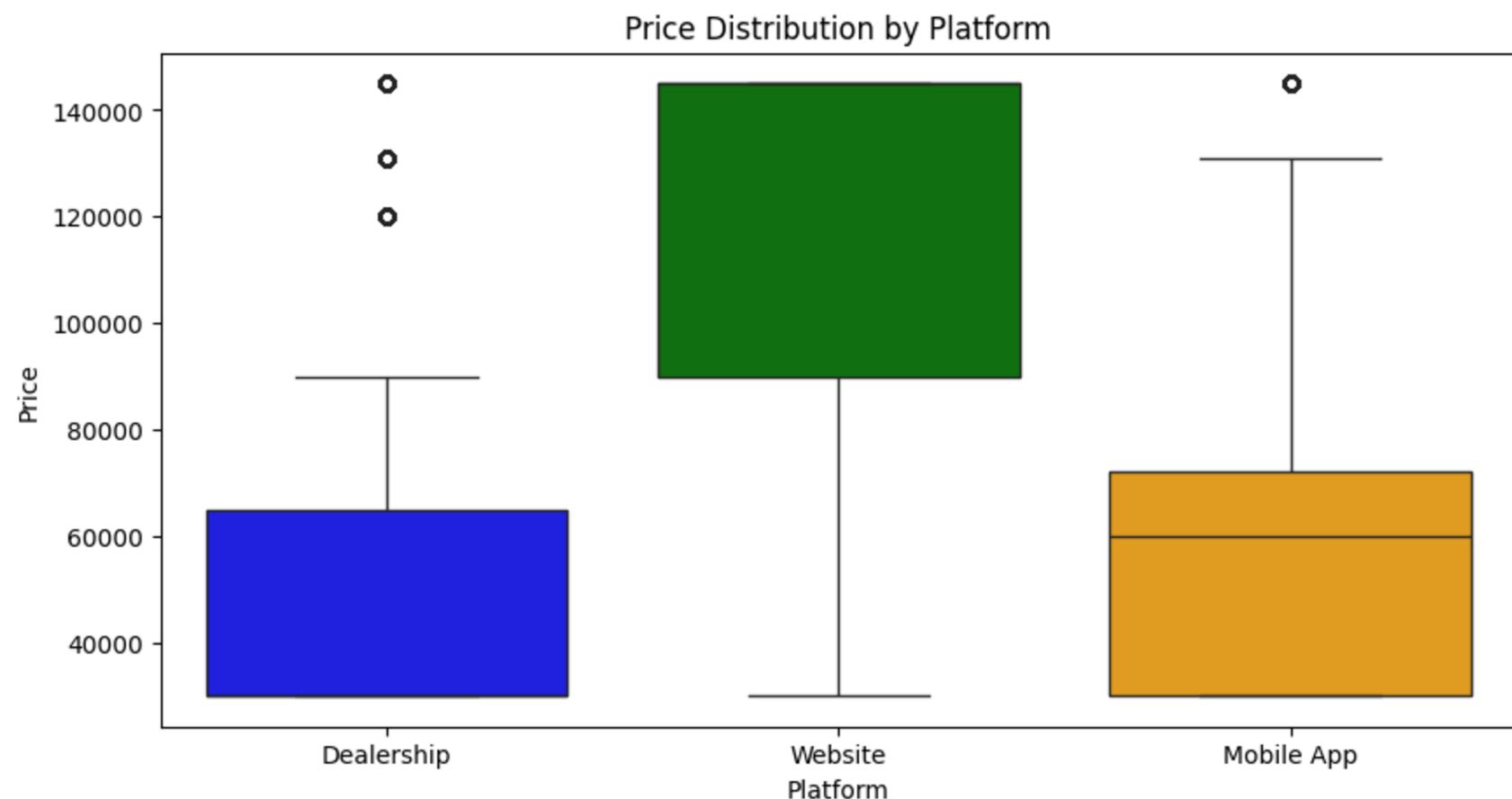
The website is performing well nowadays, but only thanks to a fairly **small user base**.

Let's analyze the problem.

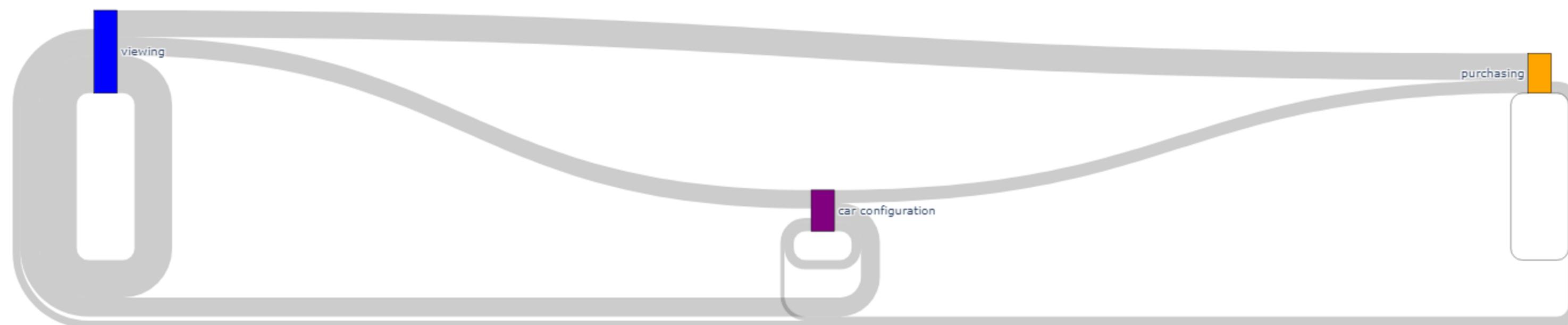
With this plot, we can observe that customers purchasing the Series 1 primarily rely on the **dealership** and the **mobile app**, while the website remains largely unused.



Given that almost all of the website's income comes from customers purchasing the i8 model and traffic is low, I believe **boosting website visits** with the help of some ads could help build customer trust on a smaller budget and encourage more purchases.



Sankey Diagram of Visit Type Transitions for Website

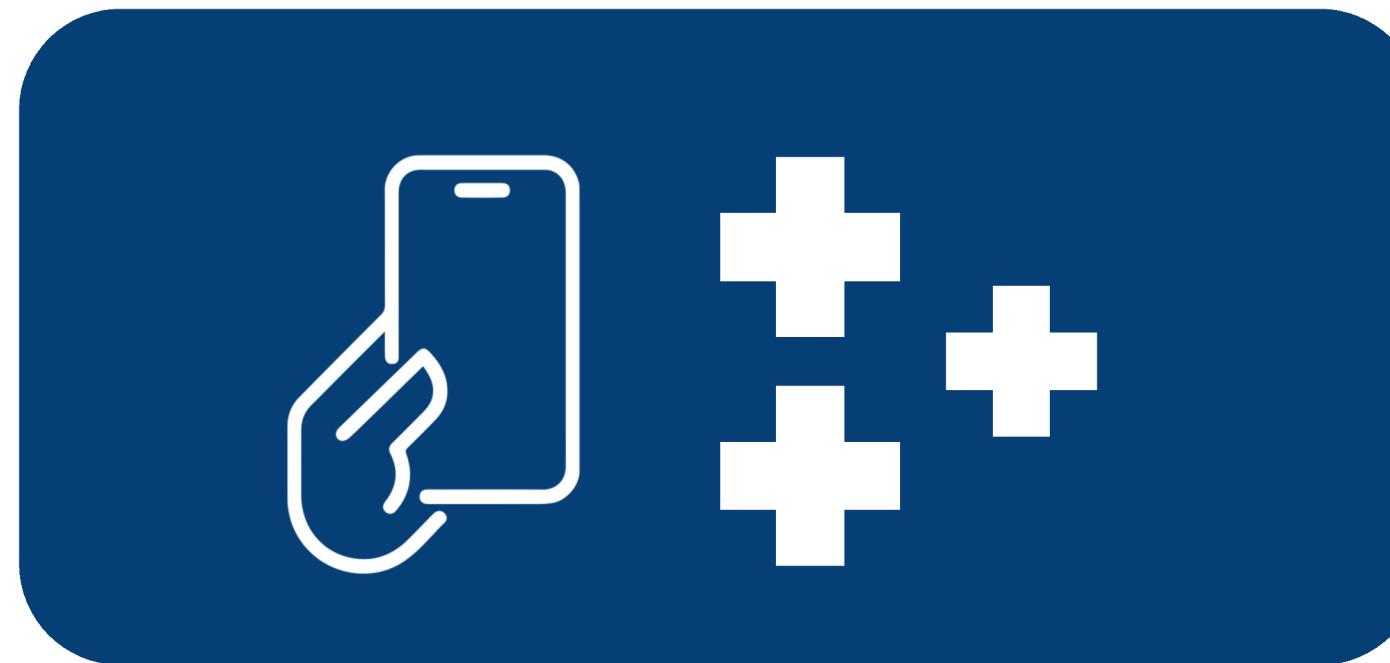


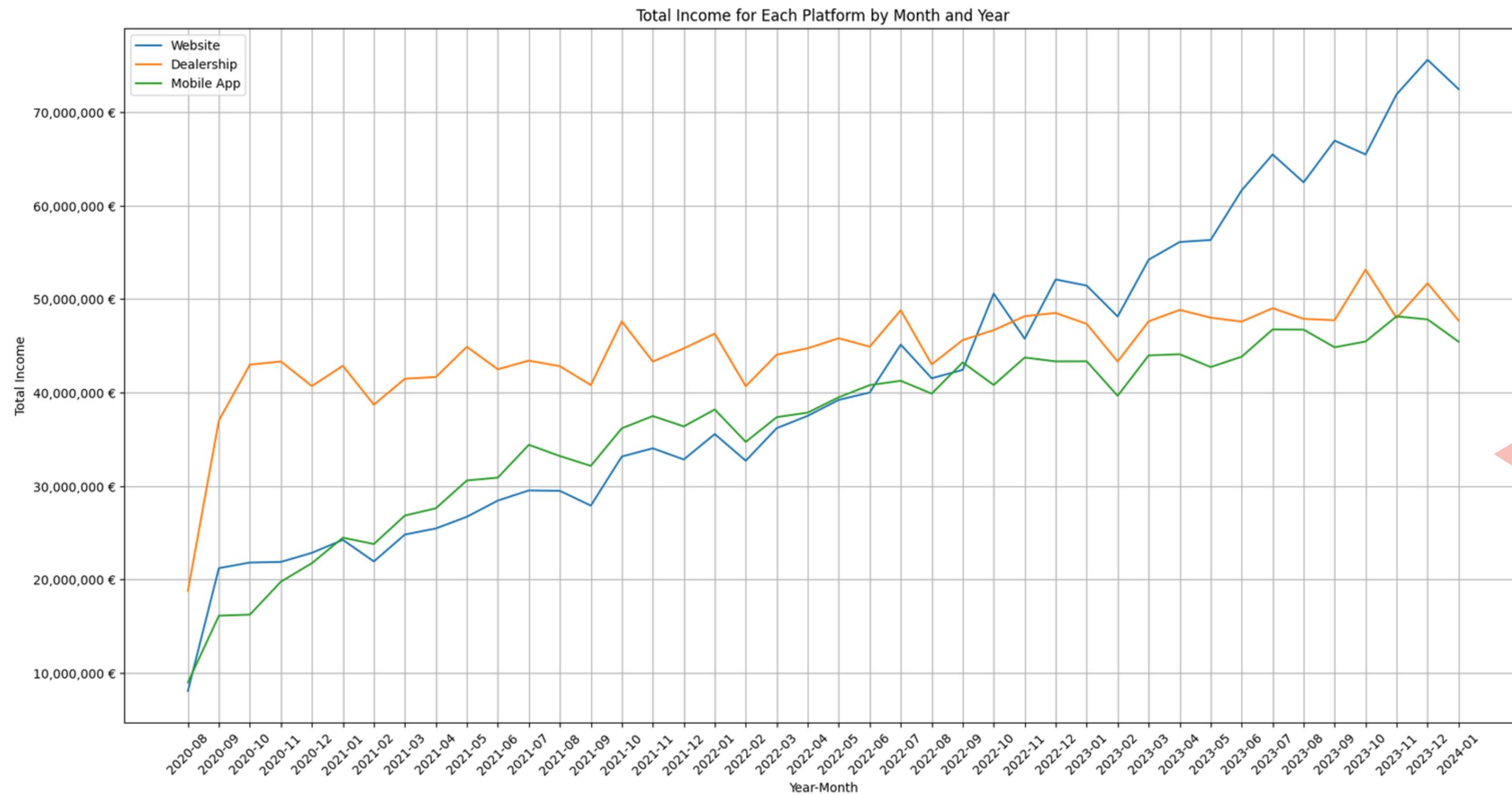
03

BOOST MOBILE APP USAGE AND ENGAGEMENT.

The mobile application is a tool that strongly contributes to sales.

Let's analyze how it could be improved.

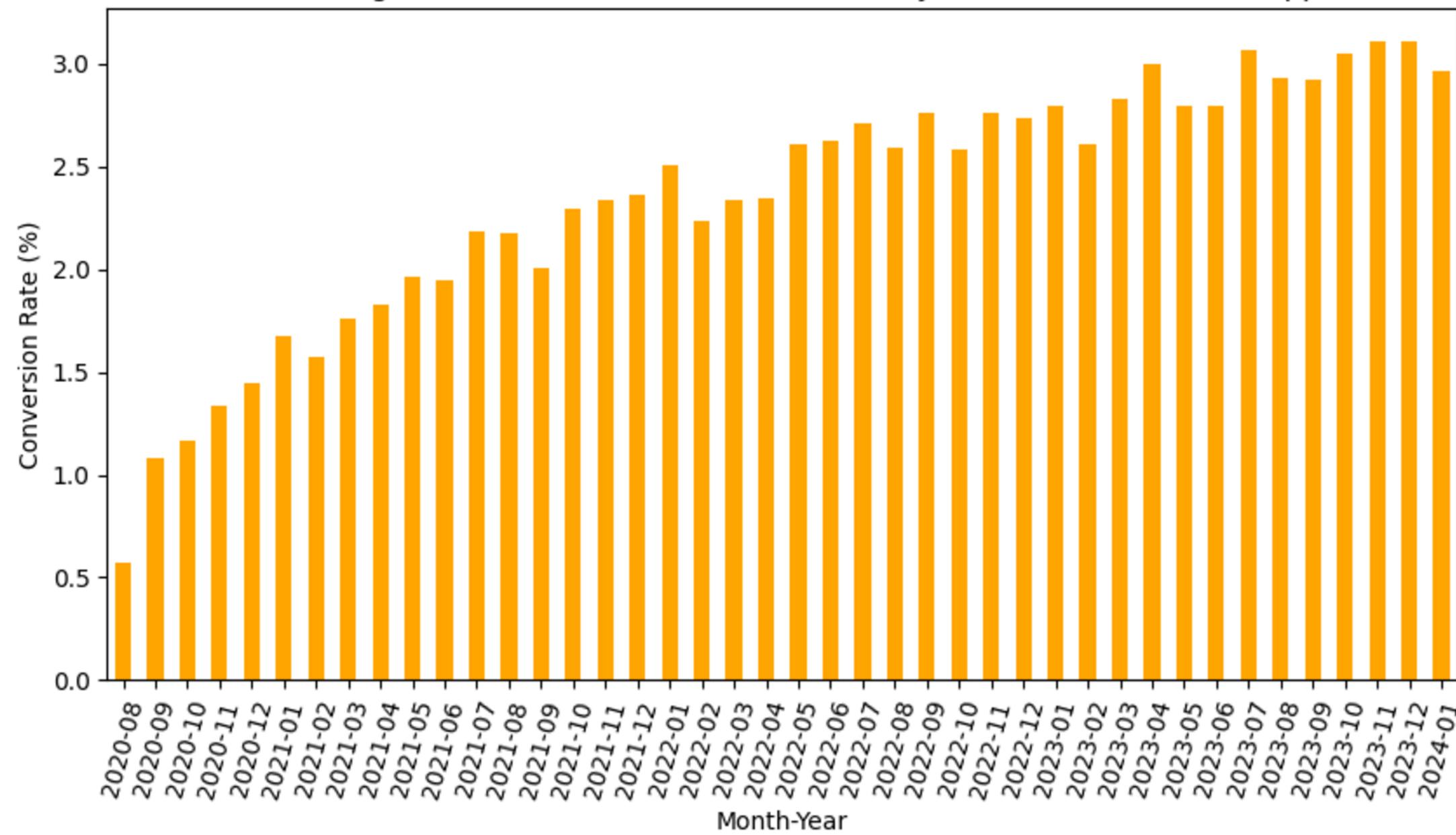




Around **October 2022**, the website significantly improved its total income, unlike the mobile app, which slowed down the growth rate.

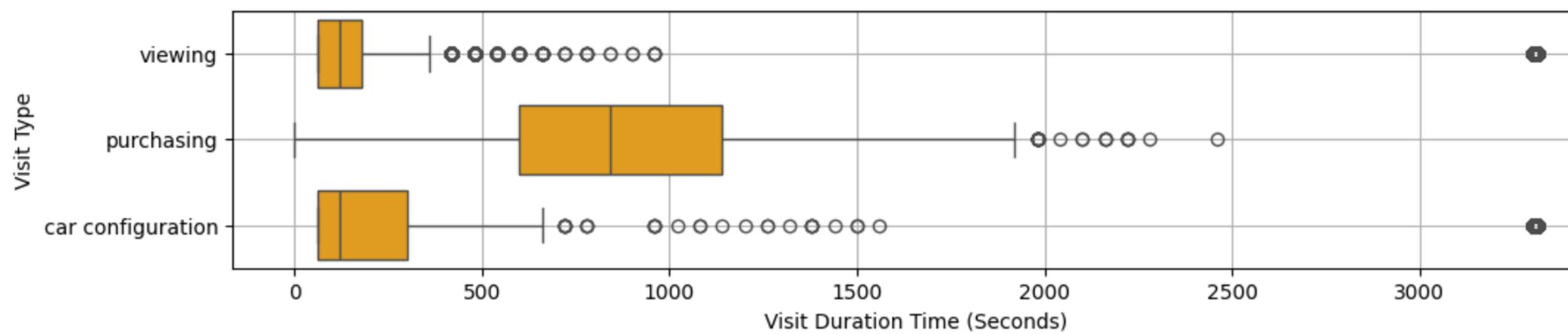
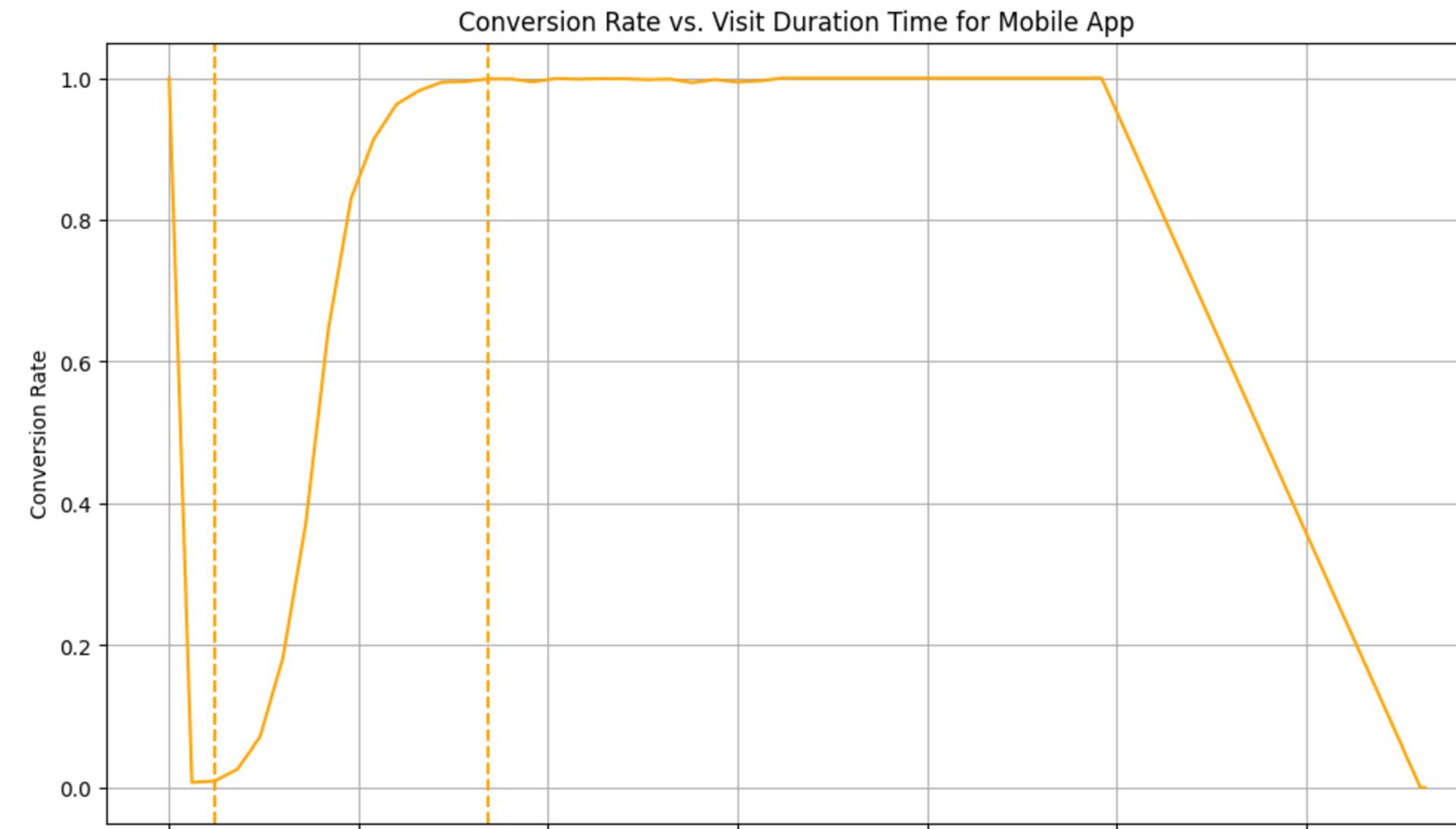


Percentage of Purchases Over All Customers by Month-Year for Mobile App

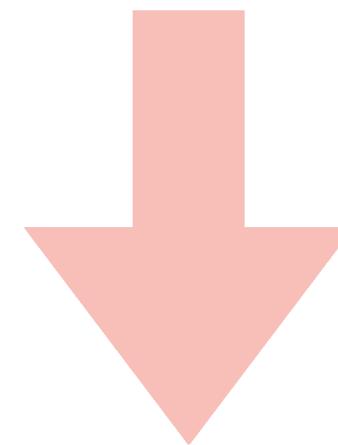


The trend is positive, but it appears that the growth has started to slow down.





Here, it can be noticed that the problem with the mobile app is that **users who do not make a purchase abandon it after less than 4 minutes on average.**



My suggestion

would be to improve the consumer journey by making the app more attractive.



APPLICATIONS OF MACHINE LEARNING

User review prediction

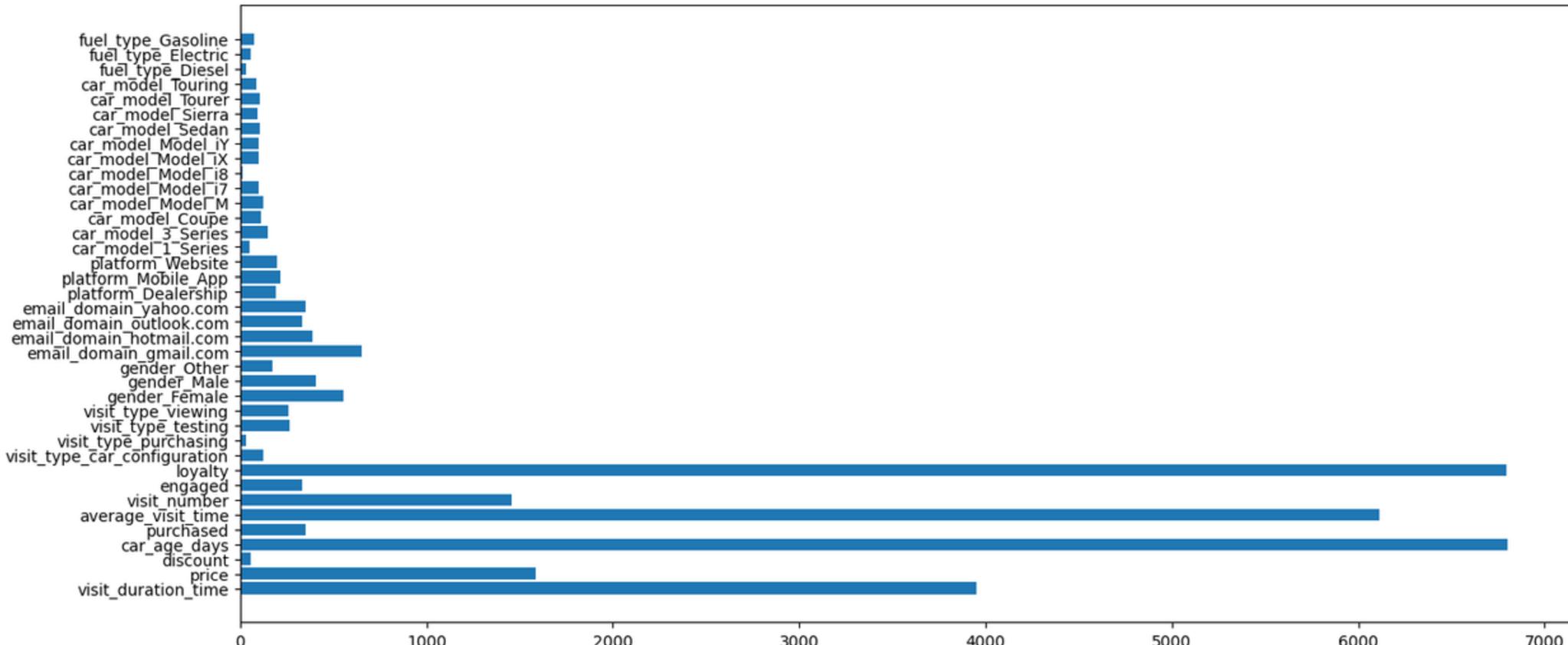
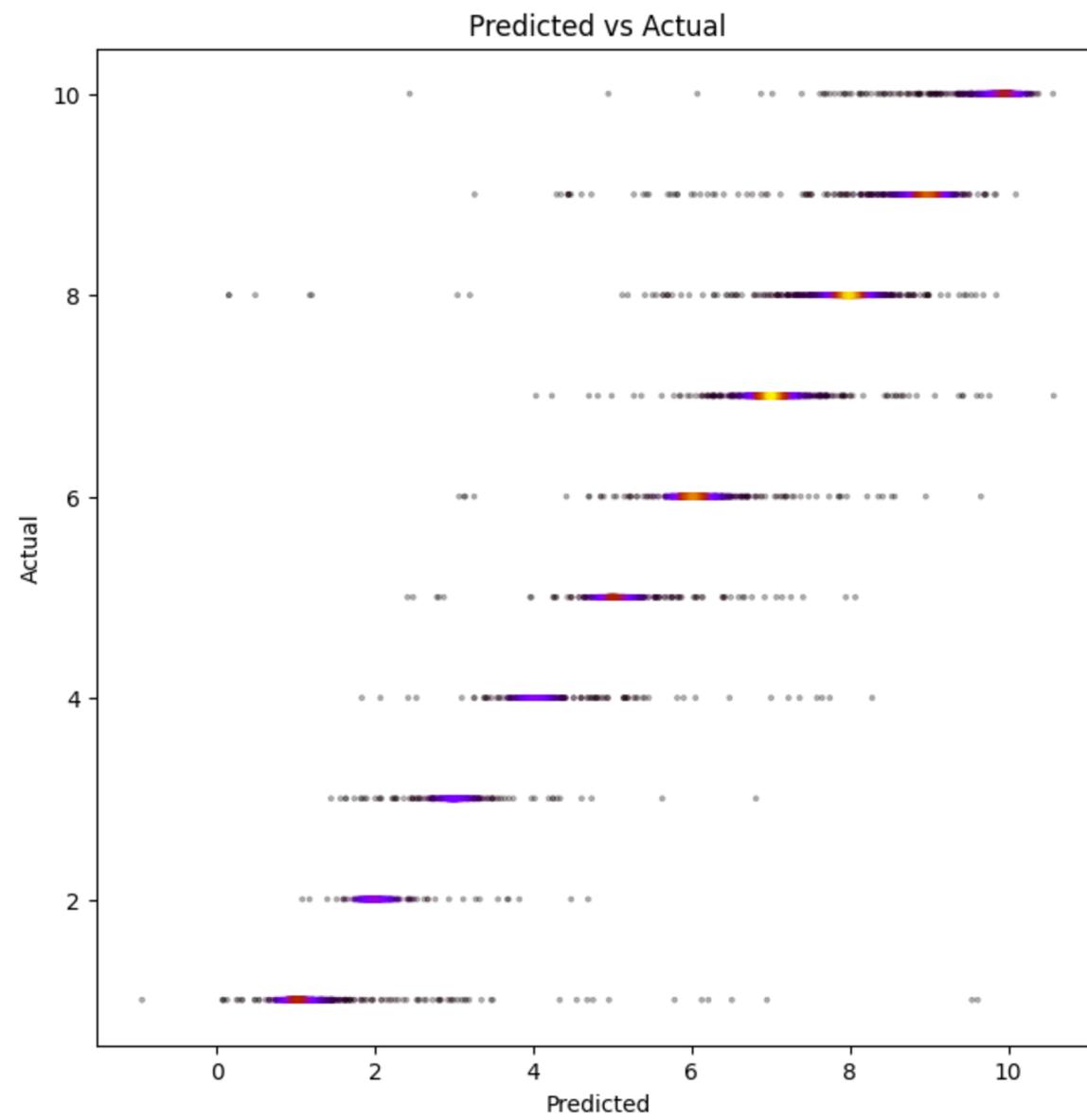
By analyzing user interactions, we can predict the quality of the overall experience.

Likelihood of purchase

Using information such as the car's age in days and the average visit time of a user, we can predict the probability of a purchase.



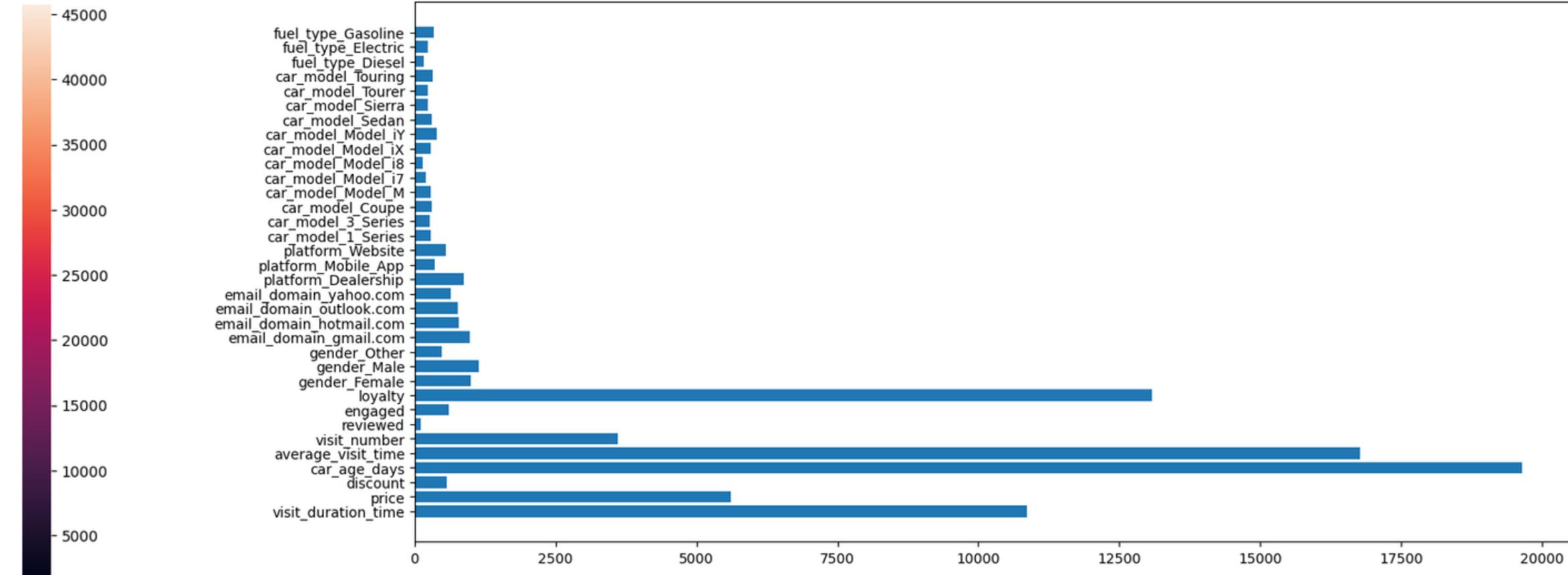
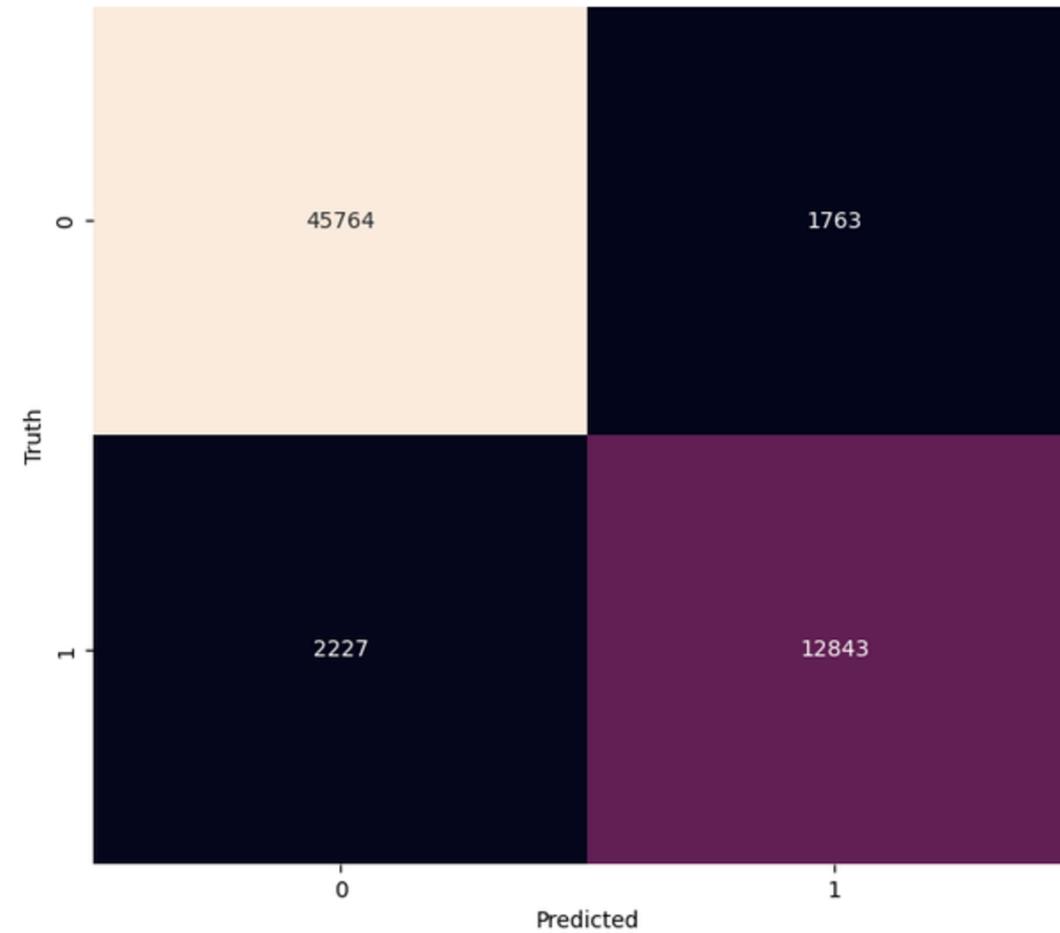
USER REVIEW PREDICTION



Metric	Value
Mean Absolute Error	0.21923296549189442
Normalized Mean Absolute Error	0.09741878414178252
Mean Absolute Percentage Error	5.943891450826299
Root Mean Squared Error	0.564151927274297
Normalized Root Mean Squared Error	0.06268354747492189
R2 score	0.9578415770421636
Spearman correlation (rho)	0.9688634486121616



LIKELIHOOD OF PURCHASE



Metric	Value
Accuracy	0.936259
Precision	0.879296
Recall	0.852223
F1 Score	0.865548



KEY POINTS RECAP

Improve Dealership Experience (Summer & Autumn):

Analyze factors behind seasonal issues and gather feedback from customers who left negative reviews to identify areas for improvement.

Run Cost-Effective Ads to Grow Website Traffic:

Utilize targeted, budget-friendly ads to increase website trust and engagement, expanding the audience beyond just high-end car buyers.

Boost Mobile App Usage & Engagement:

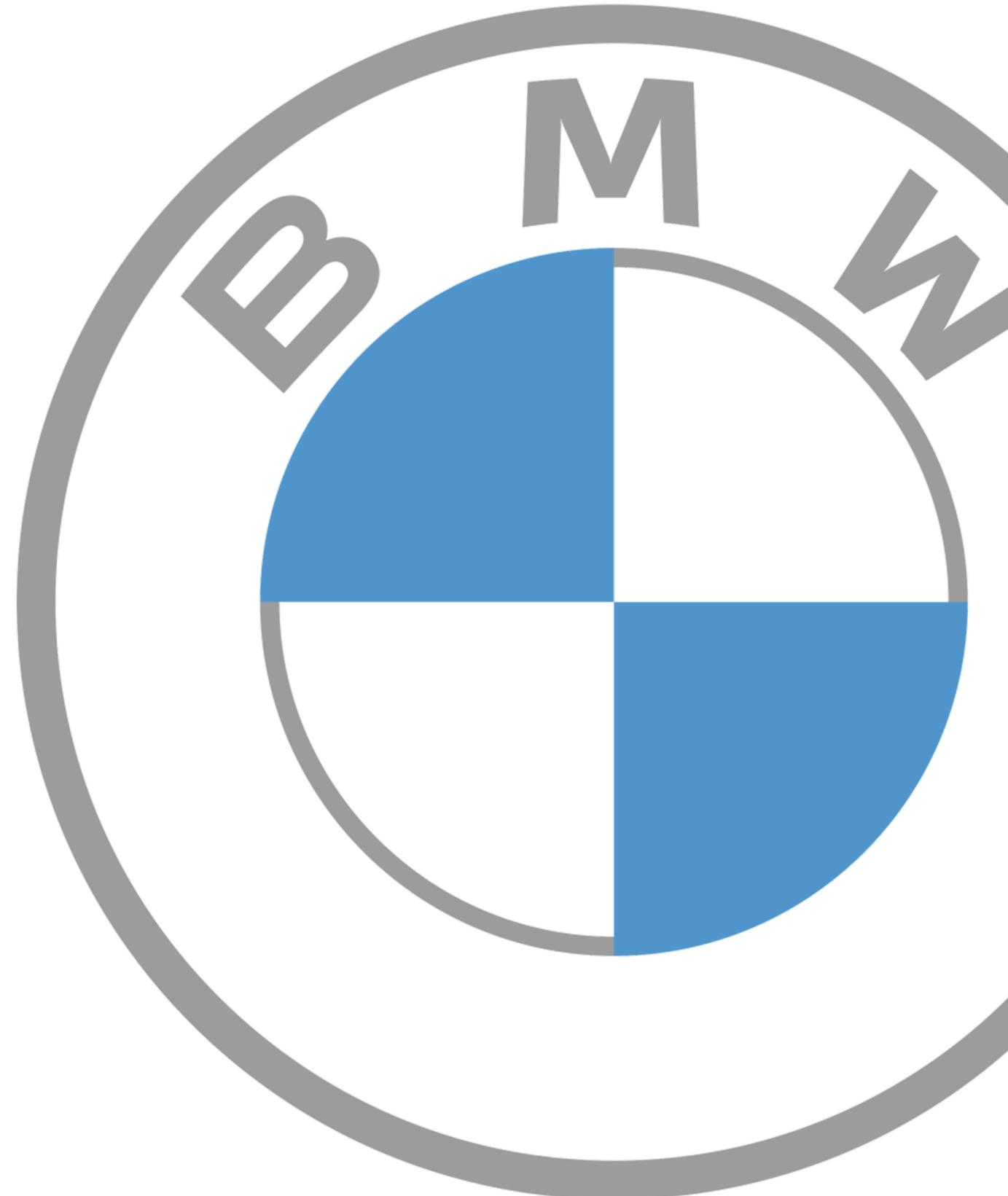
Address high drop-off rates by investing in app improvements to enhance user experience and retention, leading to better overall performance.

Use the power of AI

Given the good results obtained with two simple machine learning models, it would be useful to create recommendations based on the customer's behavior up to that moment.



THANK YOU



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