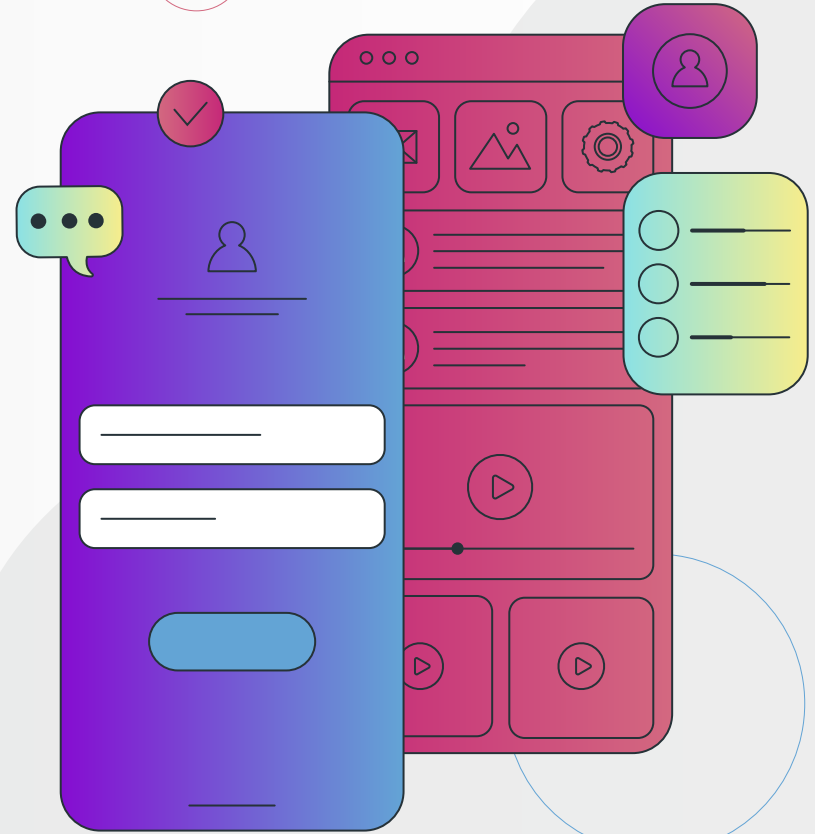


Twitter Sentiment Analysis

 Apple Inc.

August 4, 2023



OUR TEAM



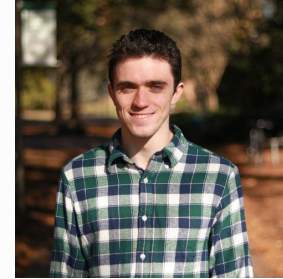
**Jordan
Johnson**

Technical Lead
[LinkedIn](#) / [GitHub](#)



**Lillian
Lakes**

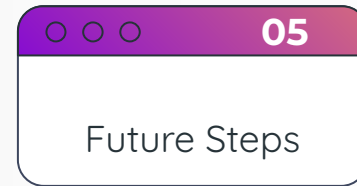
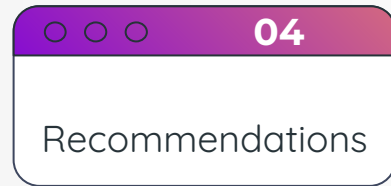
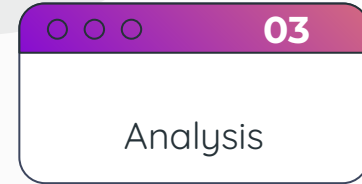
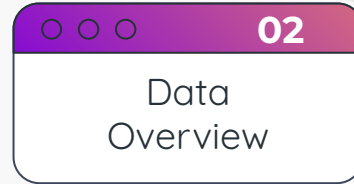
Presentation Lead
[LinkedIn](#) / [GitHub](#)



**James
McLaughlin**

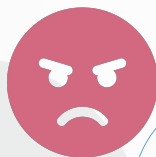
GitHub Lead
[LinkedIn](#) / [GitHub](#)

Agenda





Business Problem

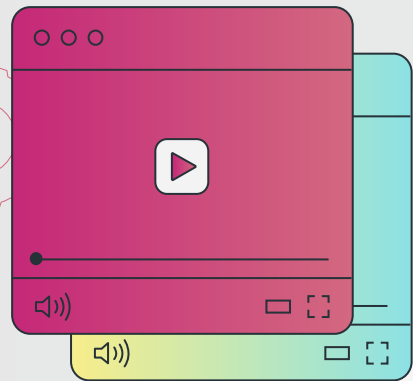


Business Problem

Apple receives more negative sentiment on Twitter as compared to Google, and they want to determine why:

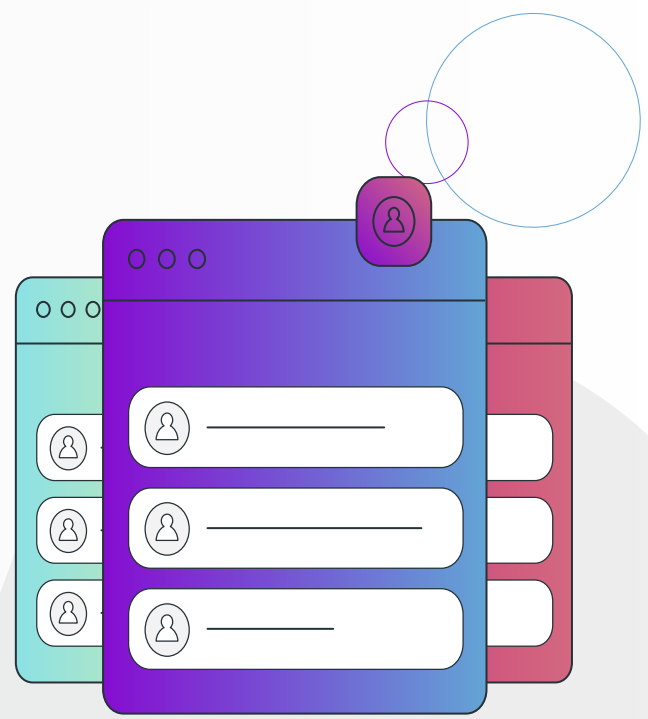
Tasked with:

- Identifying and understanding negative tweet sentiment
- Uncovering trends for negative sentiment
- Optimizing model performance to identify negative tweets



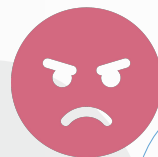
Bottom Line

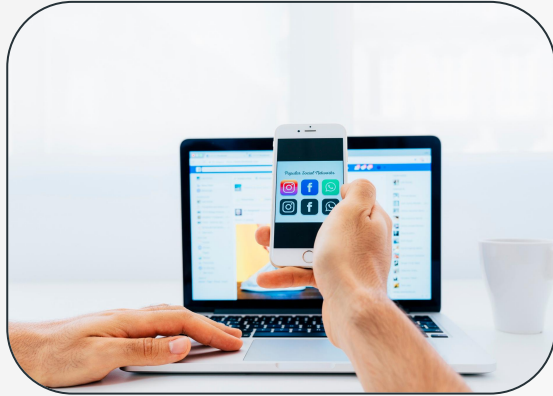
We have created a model that can predict, with **95%** precision, if a tweet is negative in nature





Data Overview



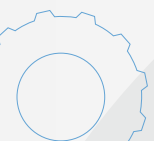


Data Overview

- Analyzed nearly **11,000** tweets
- **3** total categorical columns
- Focused solely on **Apple**, **Google** and their individual products



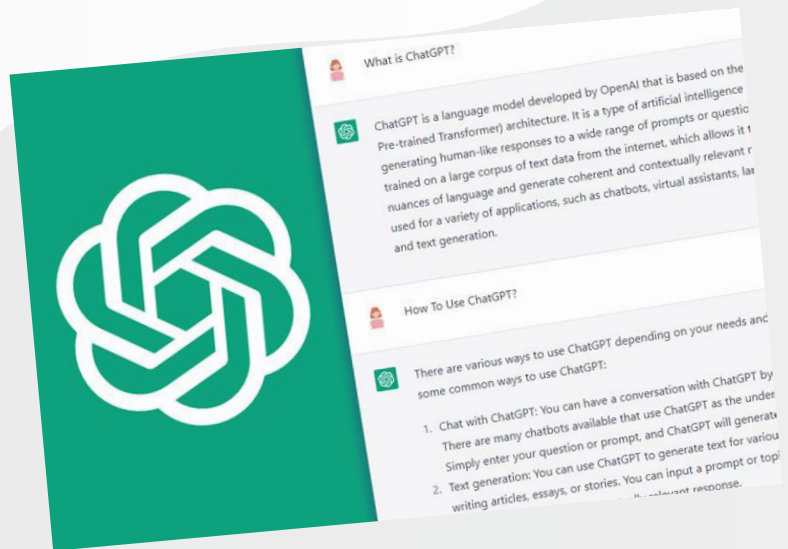
Data Limitations

- Only **3 columns** in original dataset
 - Only **7%** of the tweets were classified as 'negative'
 - No Datetimes offered in original dataset
- 



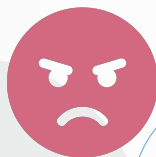
Solutions

- Engineered **1** categorical and **8** numerical features
- Prompted **ChatGPT** to generate **2,352** 'negative' tweets about Apple or Google to balance out the model classes

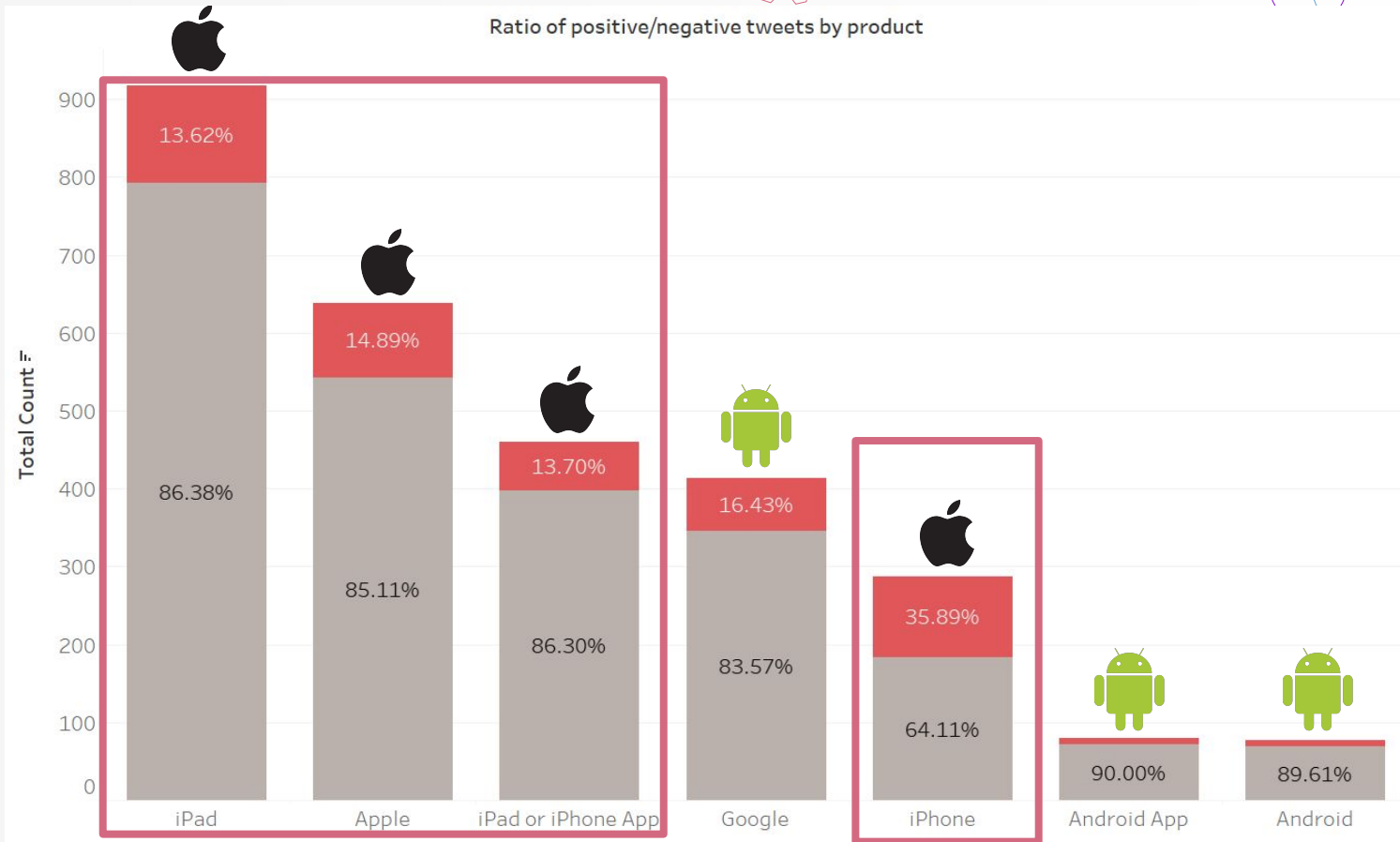




Data Analysis



Apple products on average have **more negative sentiment** than Google products



Negative tweets are often related to software, battery and price

Positive Tweets



Negative Tweets

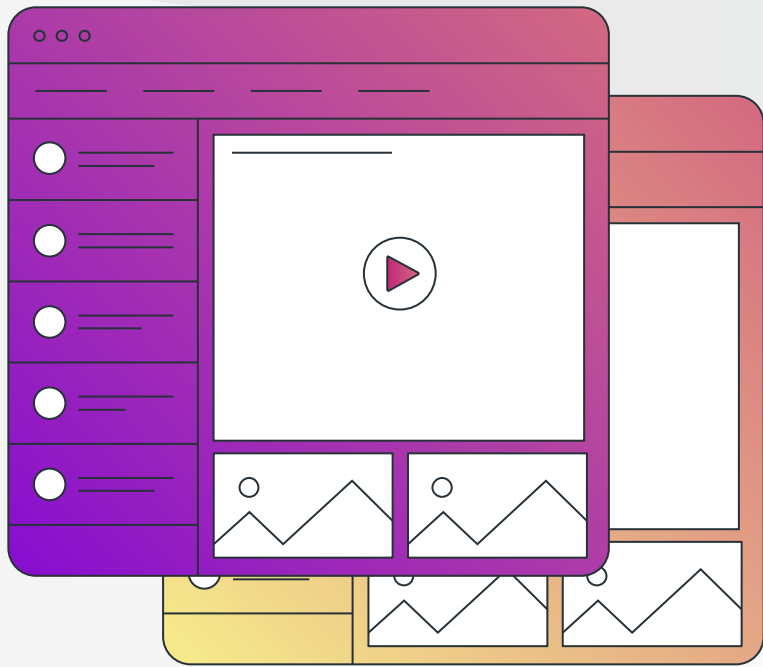


Logistic Model Prediction

True Label	Predicted Label		
	Positive Tweet (0)	Negative Tweet (1)	Neutral Tweet (2)
Positive Tweet (0)	261	7	320
Negative Tweet (1)	29	478	83
Neutral Tweet (2)	150	22	794

- **Precision**: Minimize False Positives
- True Negatives **478/507**
- Logistic model **accurately predicts negative tweets 94%** of time

Gradient Boosting Classifier produced the highest precision



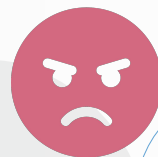
- **95%** of predicted negative tweets were actually negative
- Higher Accuracy
- Faster training on large dataset

04

Recommendations



G

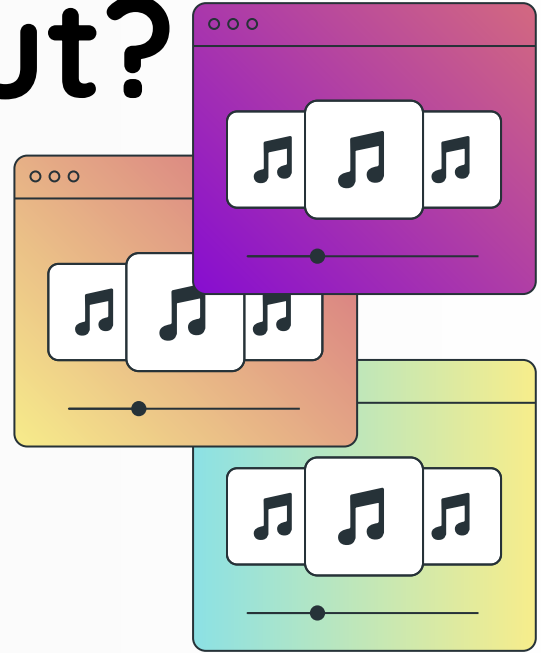


What are customers complaining about?

Battery

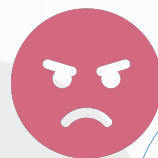
Software

Price





Future Steps



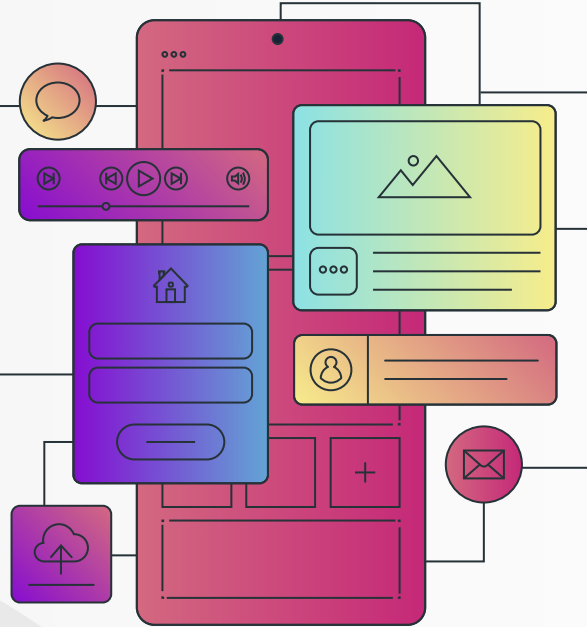
Future Steps

**More
Tweets!**

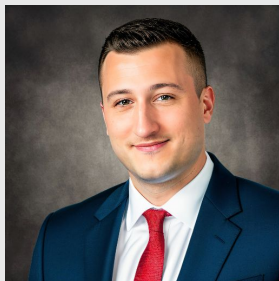
**Other
Languages**

**DateTime
Features**

**Priority
Products**



Questions?



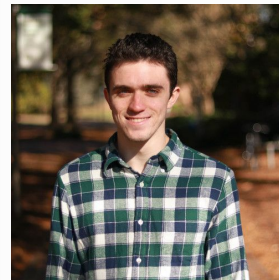
**Jordan
Johnson**

Technical Lead
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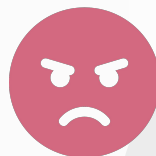
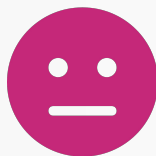
Presentation Lead
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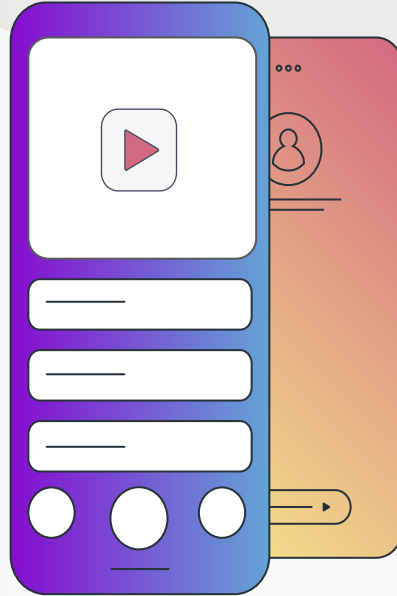
**James
McLaughlin**

GitHub Lead
[LinkedIn](#) / [GitHub](#)

Thanks!



Appendix



Positive vs. Negative Tweets

Positive



Sponge Bob ✓
@sbob



rt haha, awesomely rad ipad app by
[@madebymany](#)

10:00 AM · Jun 21, 2022 · Twitter for iPhone

💬 74 ↻ 58 ❤️ 178 📊 ⬆️

2023

Negative



Patrick Star ✓
@pstar



i have a 3g iphone. after 3 hrs tweeting at
[#rise_austin](#), it was dead! i need to upgrade.

10:00 AM · Jun 21, 2022 · Twitter for iPhone

💬 74 ↻ 58 ❤️ 178 📊 ⬆️

2023