DBL Cork - Presentation 2

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Introduction

Focus:
Sentimental Analysis for Lufthansa

Goal:
Understand how Interactions Influence a Customer's Sentiment

Competitor Benchmark:
Is Lufthansa Overperforming or Underperforming

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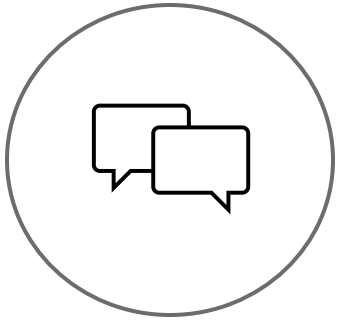
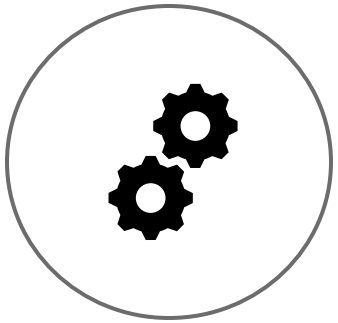


CONVERSATIONS

SENTIMENT ANALYSIS

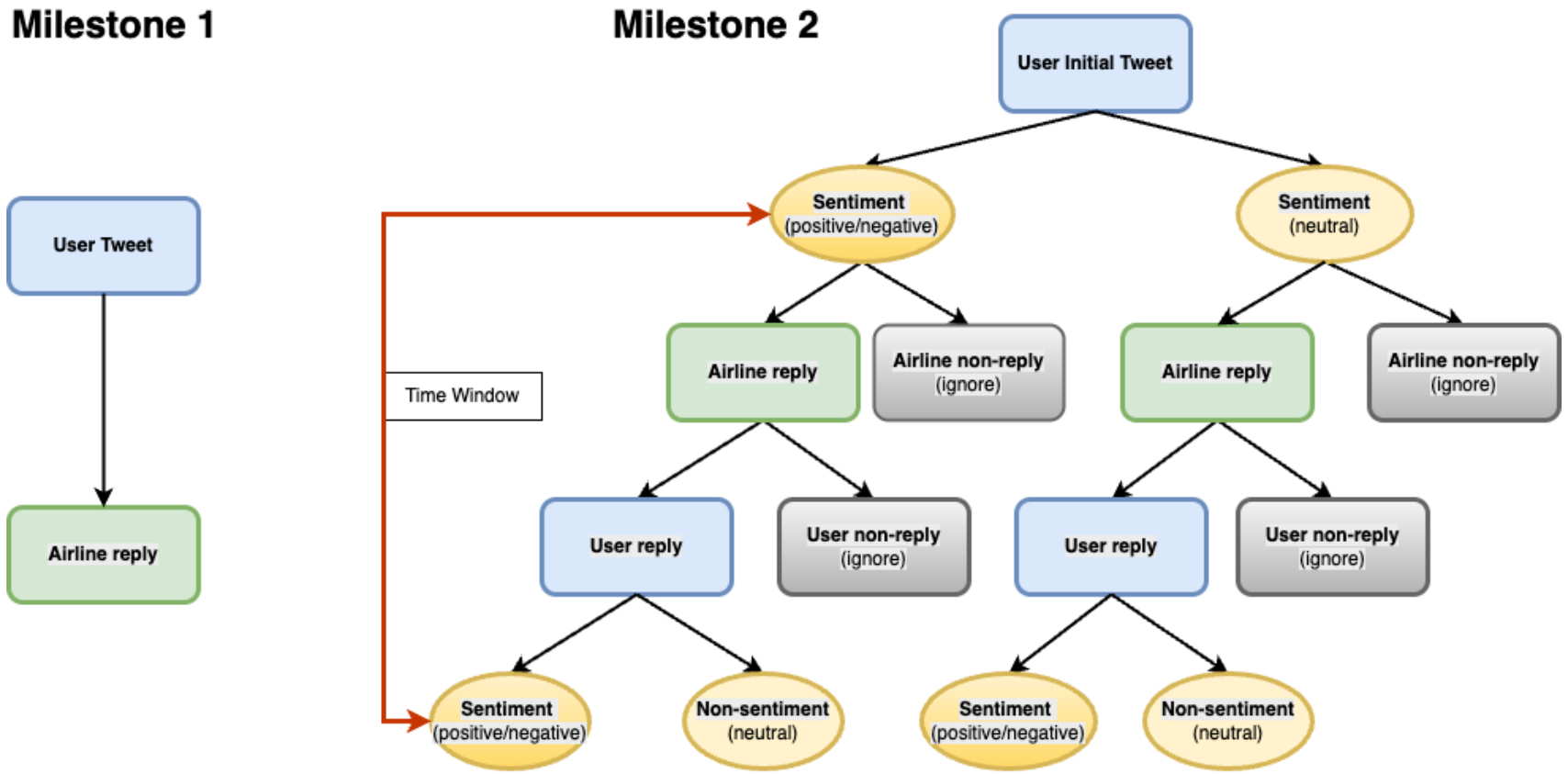


SENTIMENT EVALUATION

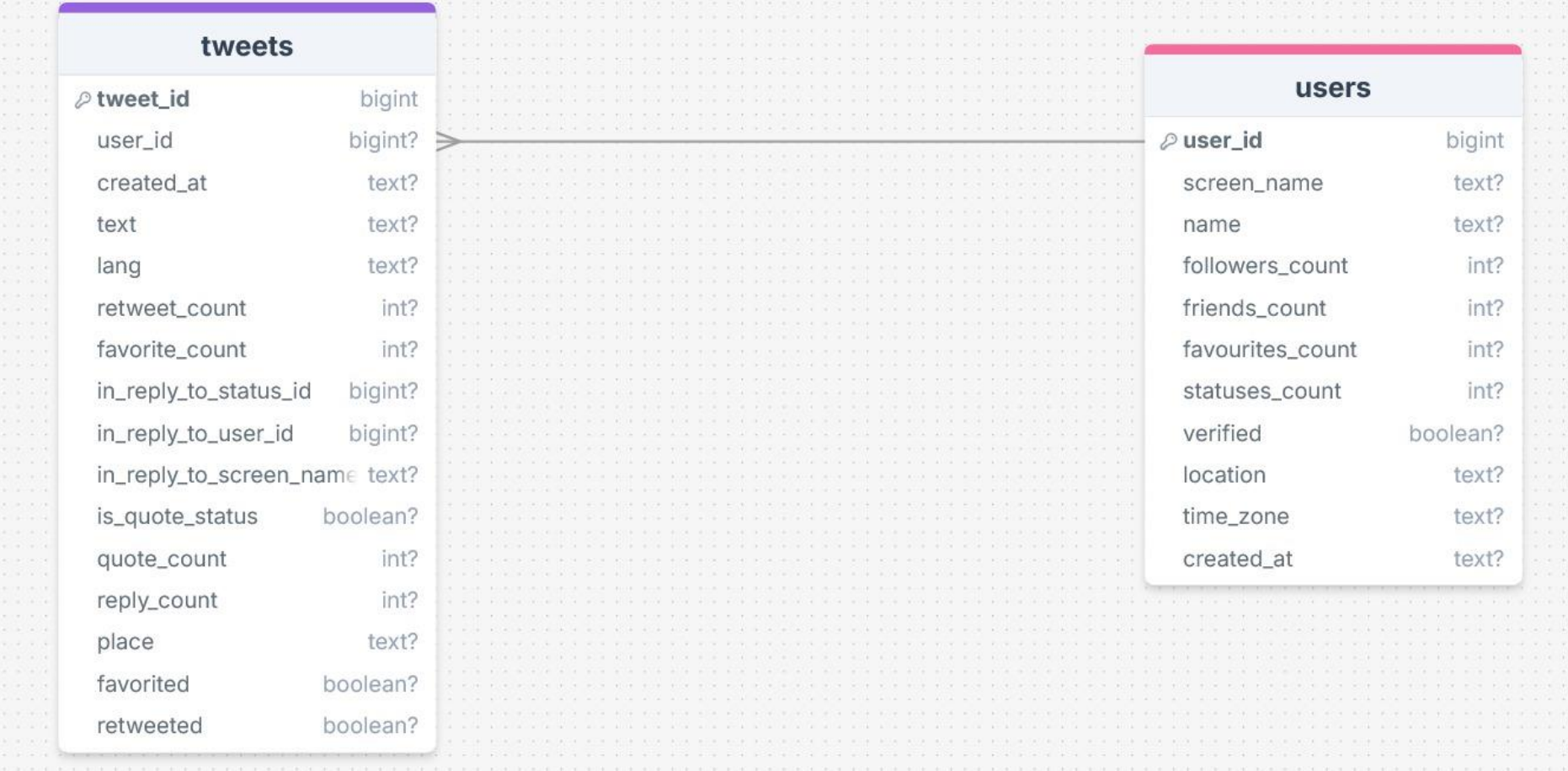
Conversations

WHAT HAS CHANGED & WHAT IS NEW

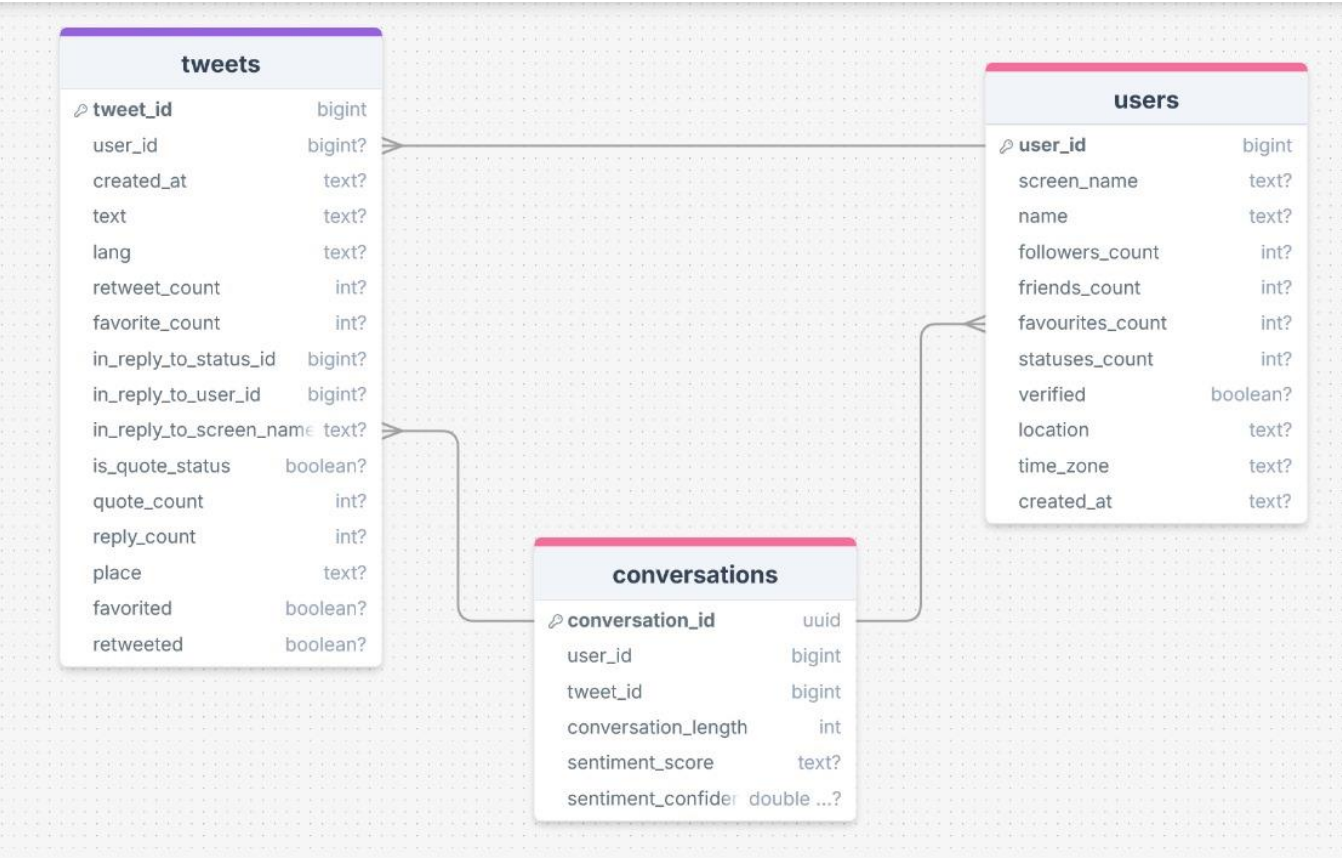
Conversation – **definition refinement**



How its stored: Database - Old



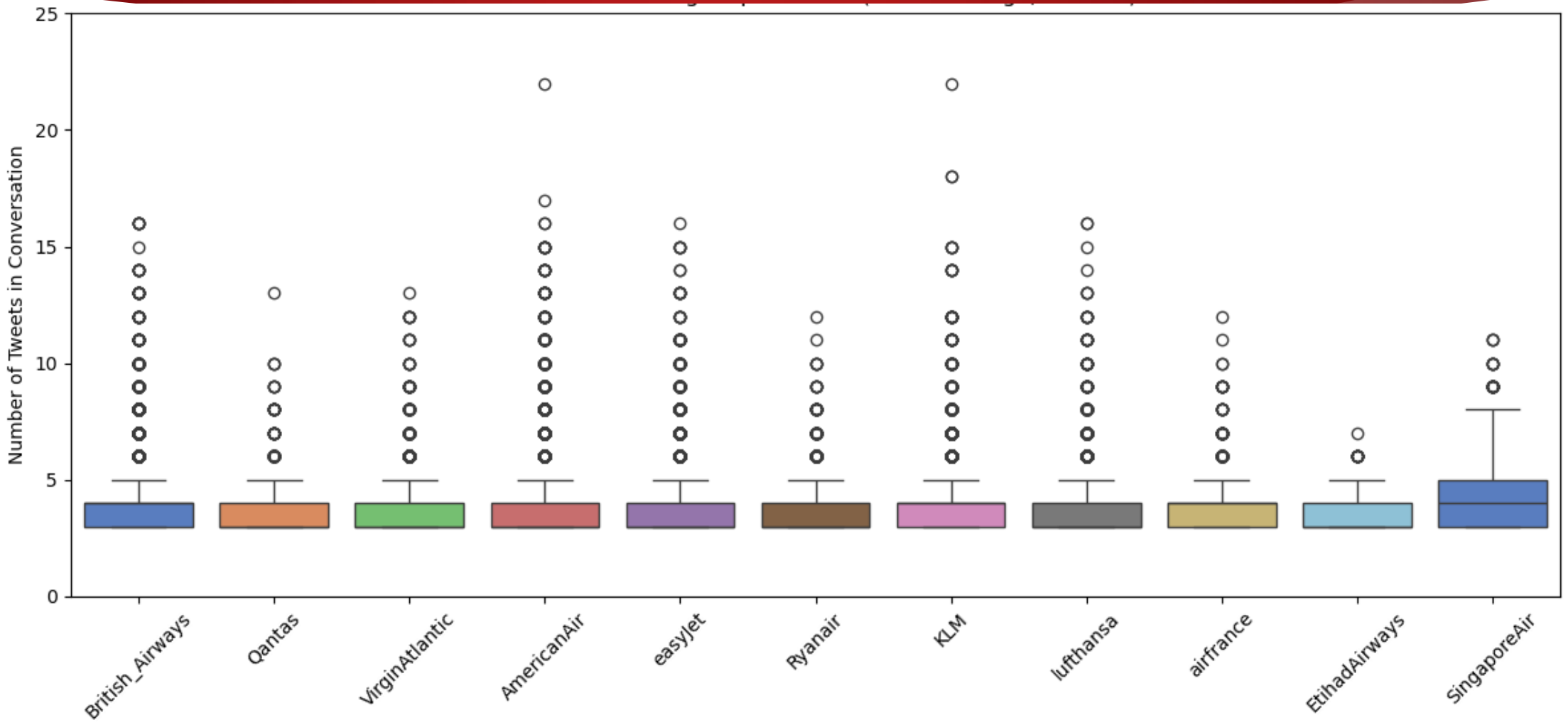
How its stored: Database - New



Mean conversation length per airline

Airline	Mean
SingaporeAir	4.11744
KLM	4.031275
British Airways	3. 945503
Lufthansa	3.927701
AirFrance	3.898973
EasyJet	3.871400
AmericanAir	3.849917
VirginAtlantic	3.661266
Qantas	3.660830
Ryanair	3.561219
EihadAirways	3.518219

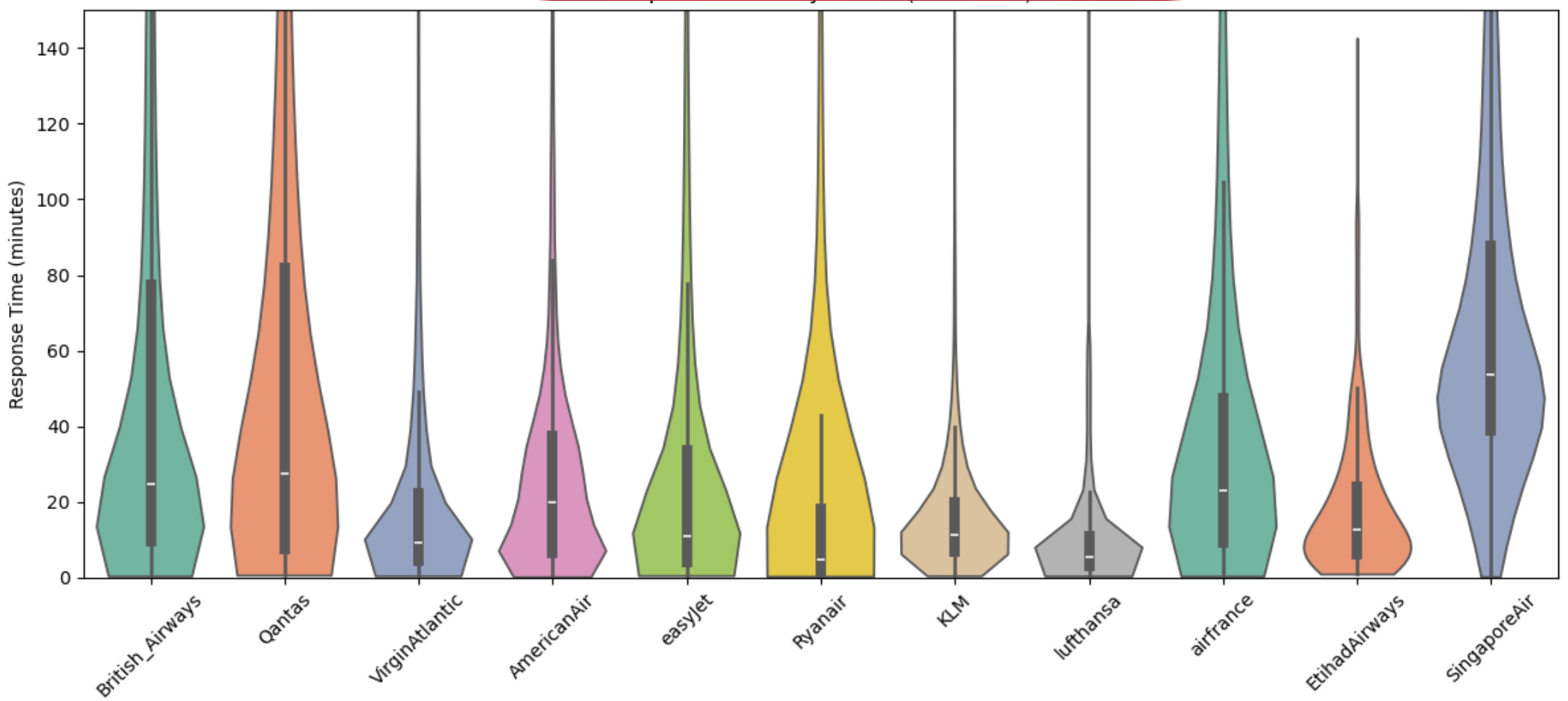
LENGTH OF CONVERSATION PER AIRLINE



Mean response time per Airline

Airline	Response Time (Mins)
British Airways	74.13
SingaporeAir	73.24
Qantas	69.97
AirFrance	46.72
Ryanair	45.20
EasyJet	43.41
AmericanAir	31.10
VirginAtlantic	21.96
KLM	19.85
EithadAirways	18.90
Lufthansa	10.78

RESPONSE TIME PER AIRLINE IN MINUTES



Sentiment Analysis

SENTIMENT ANALYSIS - TECHNIQUE

Multilingual
Supports 30+ languages, ideal for international tweets.

-Twitter-Optimized
Trained on real tweets → understands emojis, hashtags, mentions, slang.

-High Accuracy
Outperforms general models like BERT in sentiment classification.

-Lightweight & Fast
Efficient on CPUs and compatible with Apple M1/M2 chips.

WHY WE USE XLM-RoBERTa (CardiffNLP)?

CARDIFFNLP'S XLM RoBERTa model is specifically designed for sentiment analysis on multilingual tweets.

It builds on Facebook AI's XLM-RoBERTa and is fine-tuned using real-world Twitter data.

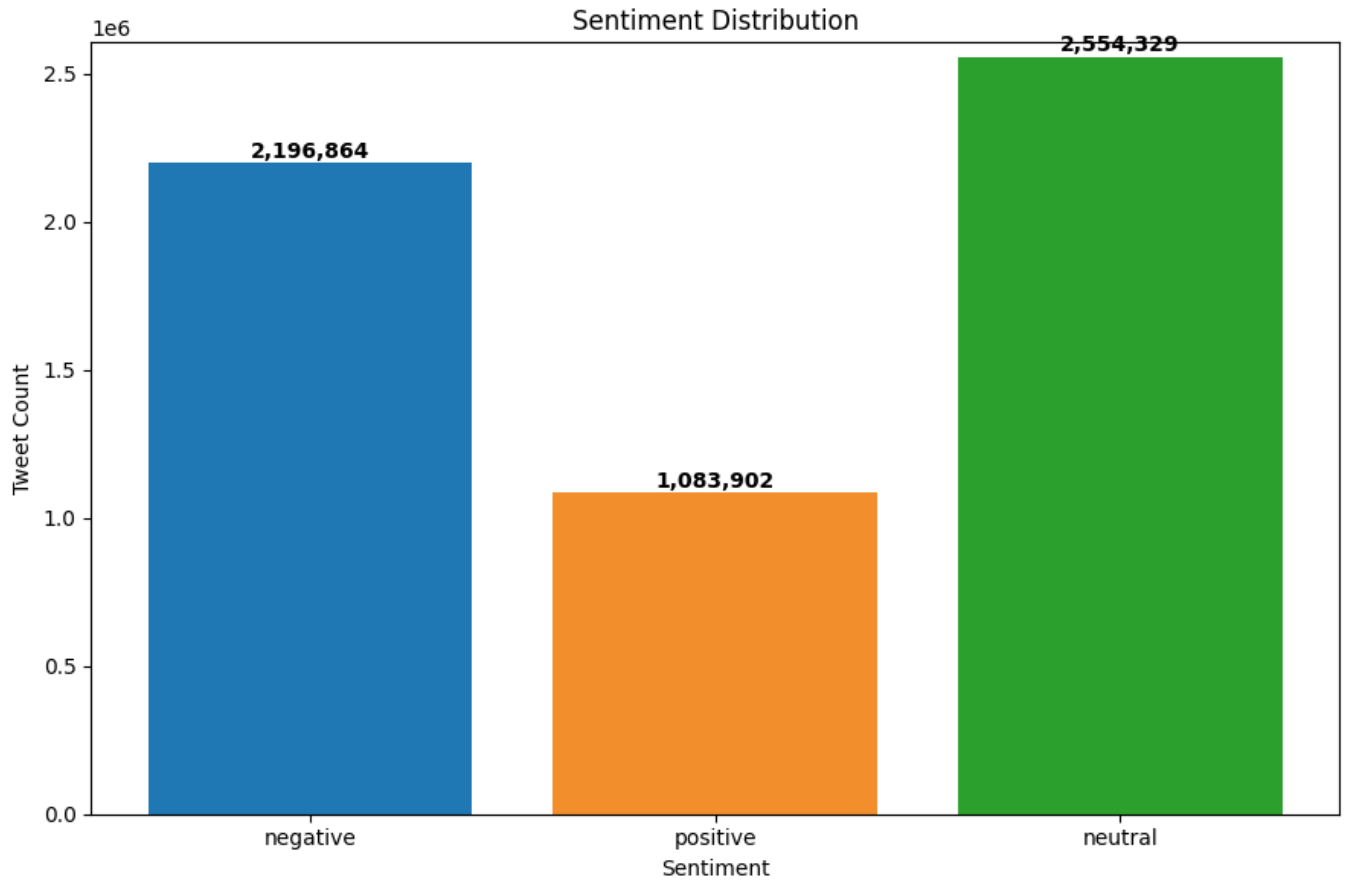
DISTRIBUTION OF THE SENTIMENT

Bar chart indicates that most customer interactions are either neutral in tone or contain complaints, while positive experiences are less frequently expressed.

NEGATIVE – 37,65%

POSITIVE – 18,57%

NEUTRAL – 43,78%

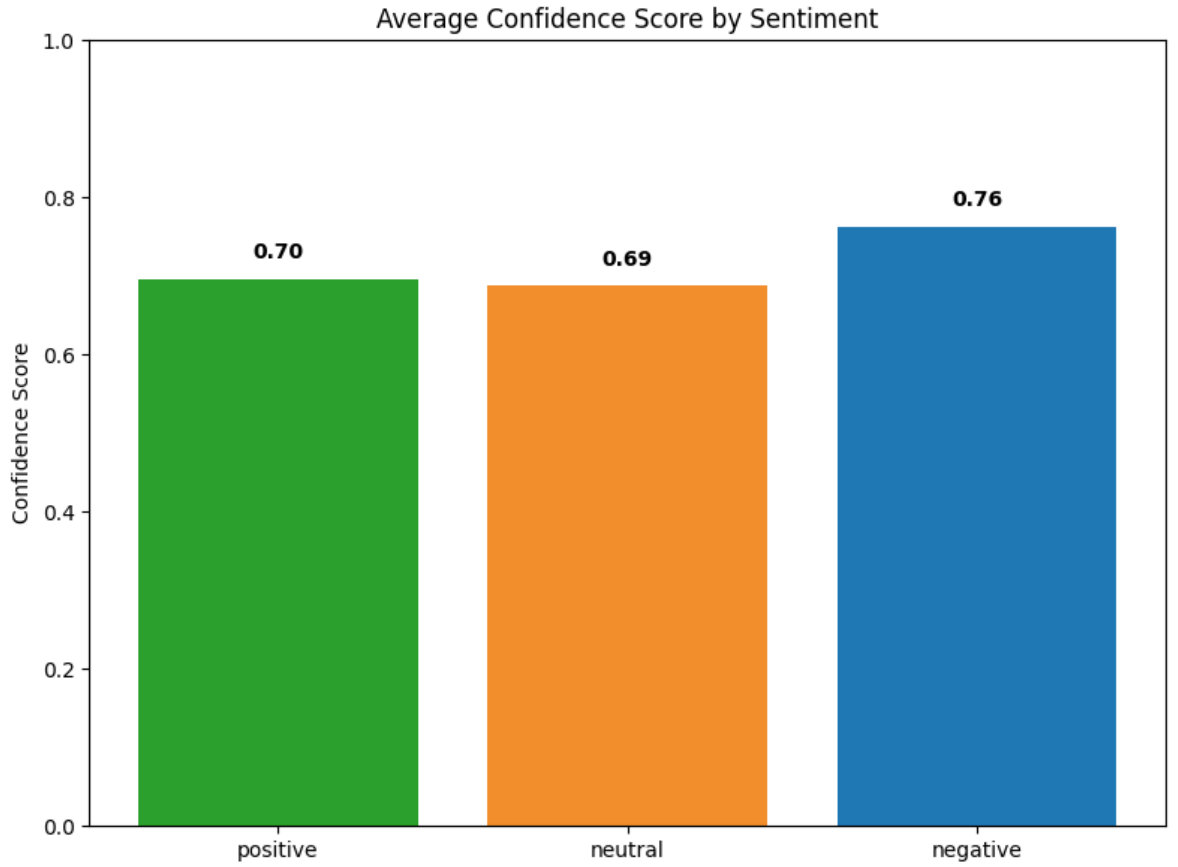


CONFIDENCE LEVEL OF THE SENTIMENT ANALYSIS

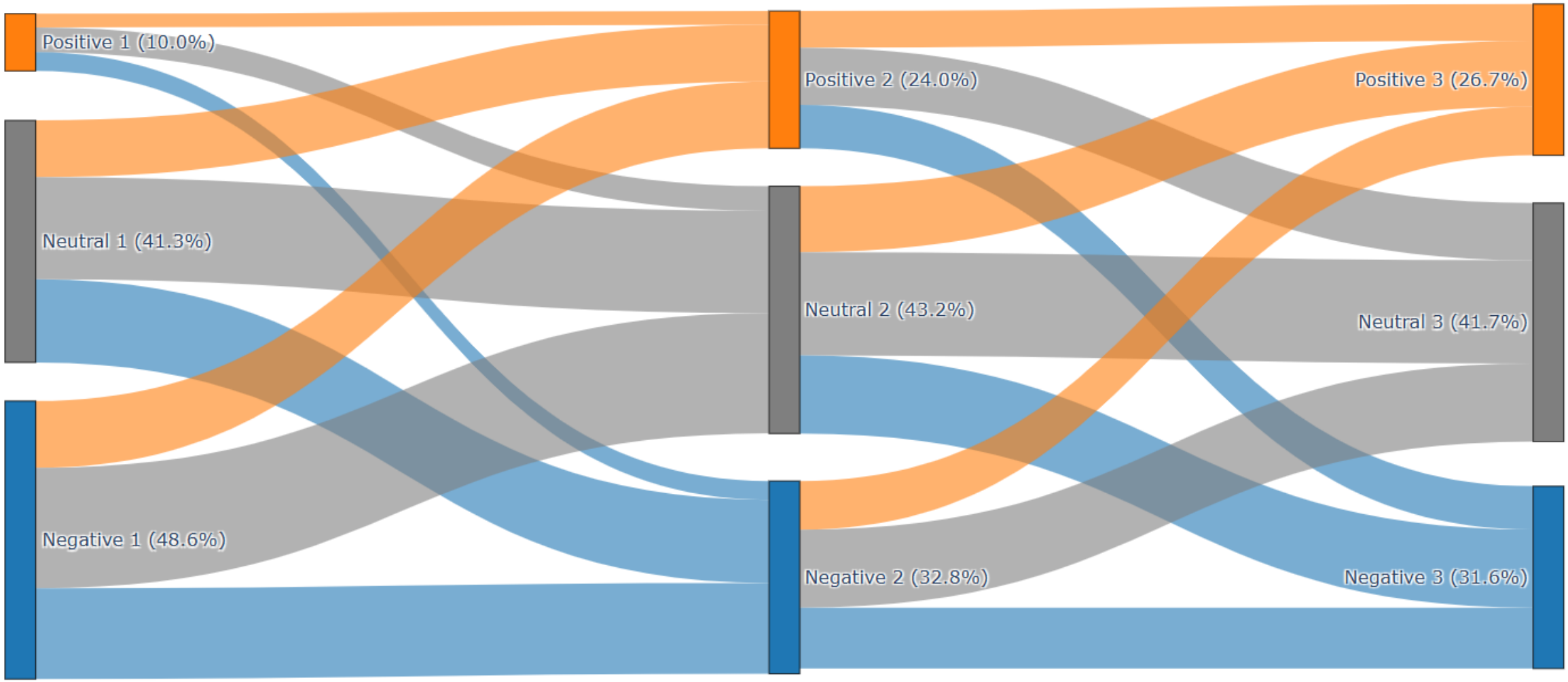
WHY DO WE USE CONFIDENCE SCORES?

Confidence score shows how certain the model is about its sentiment prediction.

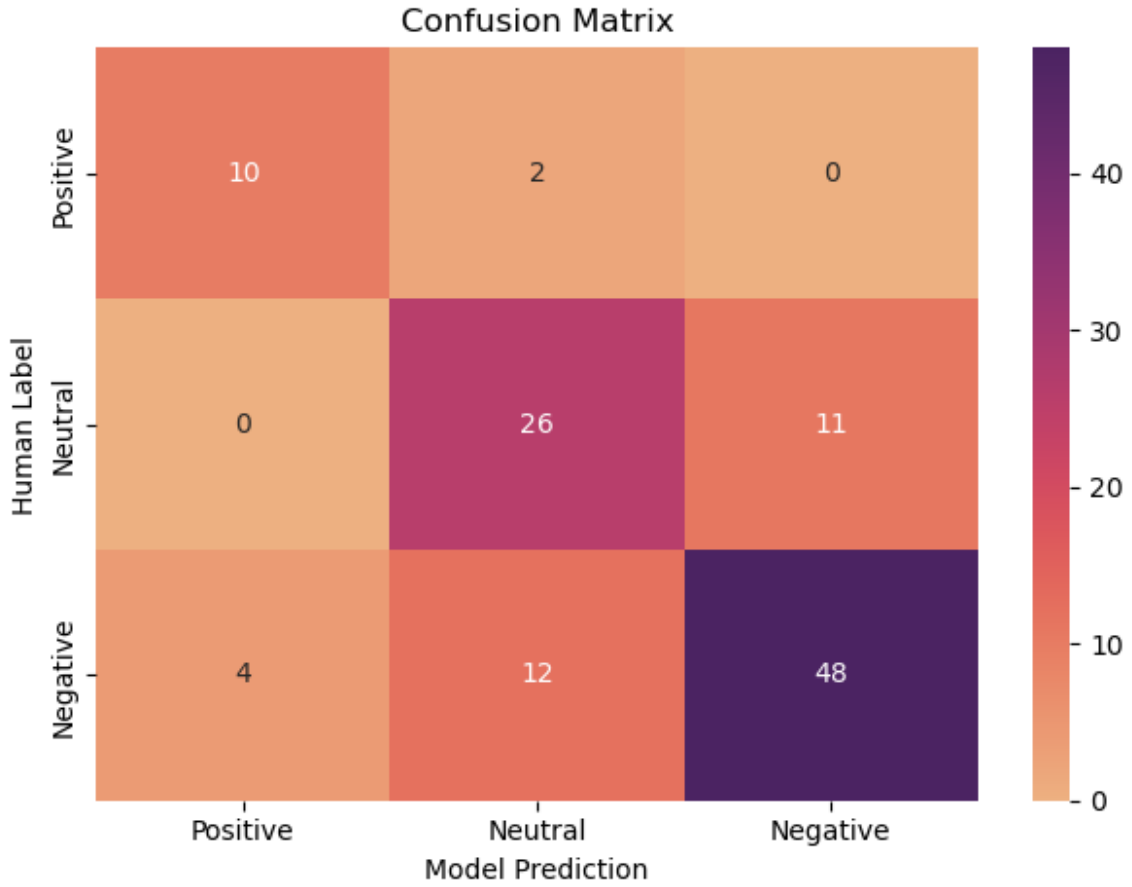
- Helps detect uncertain or borderline tweets
- Useful for filtering out low-confidence predictions
- Allows ranking tweets by prediction reliability
- Supports further analysis (e.g., bias, sensitivity)



Sankey Diagram



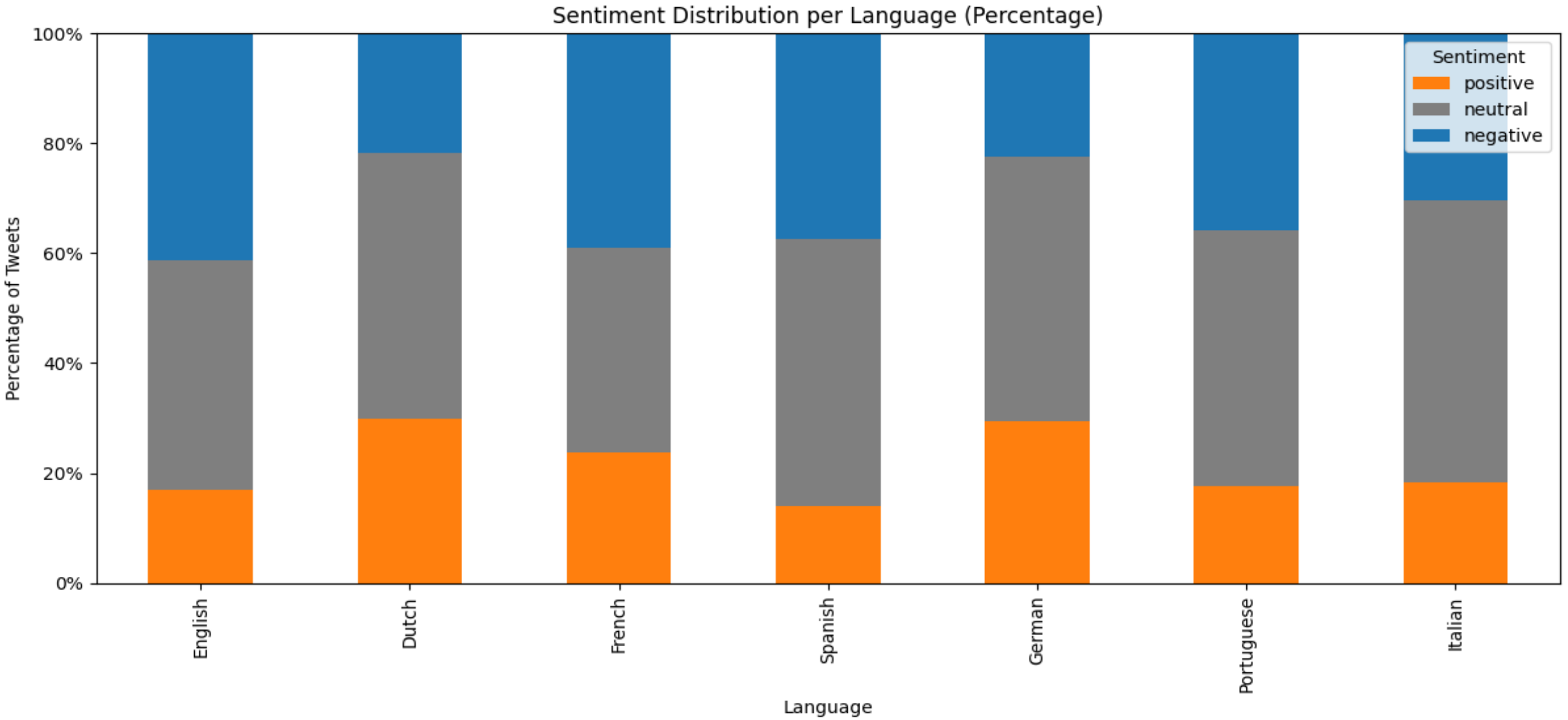
SENTIMENT ANALYSIS - EVALUATION



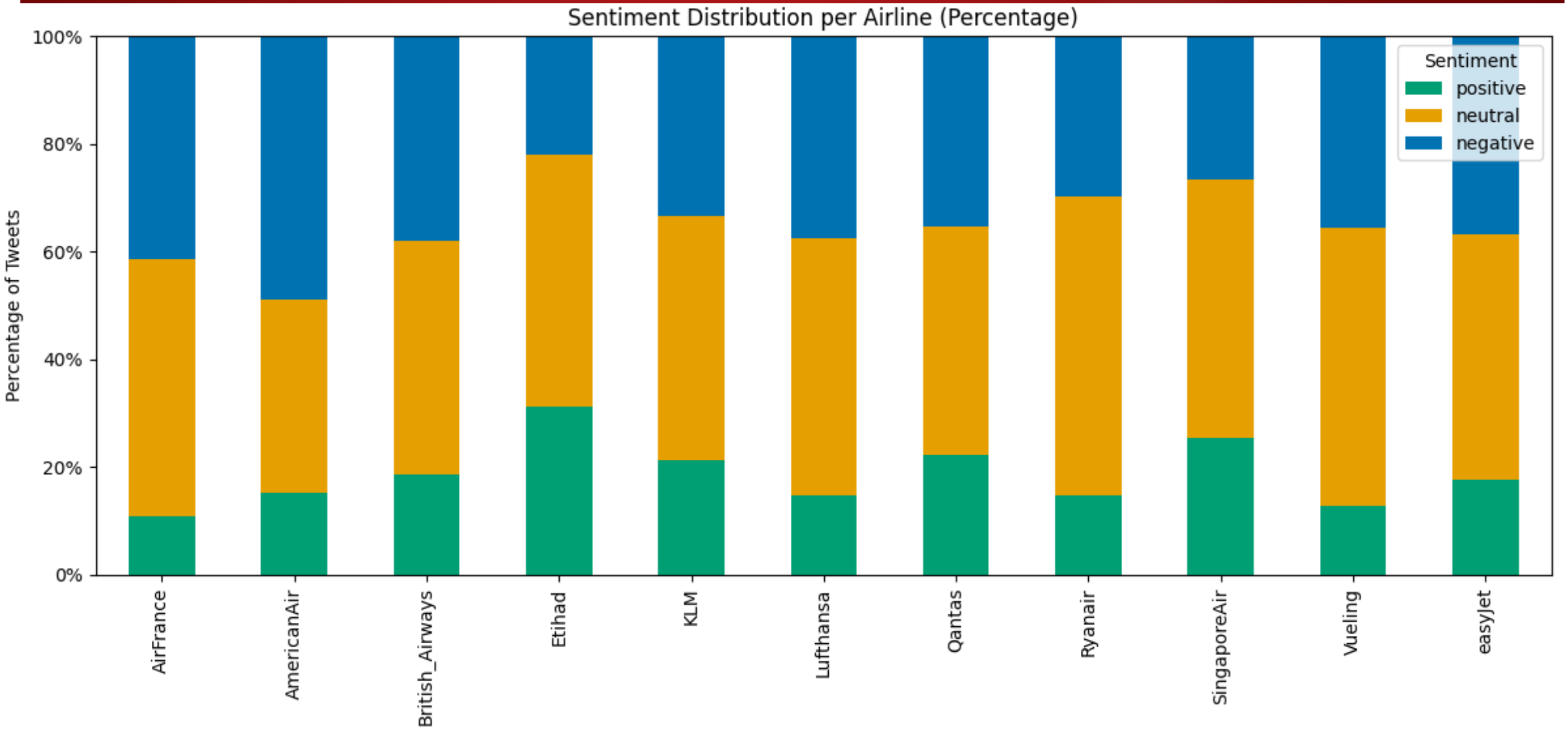
Sentiment Analysis - Evaluation

	Precision	Recall	F1-Score	Support
Negative	0,81	0,75	0,78	64
Neutral	0,65	0,70	0,68	37
Positive	0,71	0,83	0,77	12
Accuracy	-	-	0,74	113
Macro avg	0,73	0,76	0,74	113
Weighted avg	0,75	0,74	0,74	113

Sentiment Level Per language



Sentiment Level Per Airline



Conclusion

Lufthansa current position:

- shortest response time
- low positive interactions

Lufthansa's next step:

- understand the customers better
- improve their customer service

Q&A