KENYA AIRWAYS

SENTIMENT ANALYSIS

WHOA!

MEET OUR TEAM

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INTRODUCTION

PROJECT OVERVIEW

- Analyze Kenya Airways customer reviews to assess satisfaction and service quality.
- Use sentiment analysis to classify reviews into positive, negative, or neutral sentiments.
- Identify service strengths and areas for improvement.
- Provide insights to enhance customer experience and drive operational improvements.

PROBLEM STATEMENT

Kenya Airways is challenged by the vast amount of unstructured customer feedback available through online reviews. Without an efficient method to analyze this feedback, the airline may overlook critical insights that could lead to service improvements.

This project aims to address this challenge by systematically analyzing the sentiment of customer reviews, providing Kenya Airways with a clear understanding of customer perceptions and identifying key areas that require attention.

KEY STAKEHOLDERS

1. Customer Service Department

- **Key Role:** Directly responsible for addressing customer feedback and improving service quality based on insights from the sentiment analysis.

2. Executive Leadership

- **Key Role:** Makes strategic decisions based on overall customer satisfaction trends and insights to enhance the airline's competitive position.

3. Marketing & Communications

- **Key Role:** Uses sentiment analysis to refine marketing strategies and improve brand messaging, ensuring it resonates with customer sentiments.

4. Operations Management

- **Key Role:** Implements changes in operational procedures and services to address the specific issues identified through sentiment analysis.

OBJECTIVES

★ **Develop a robust sentiment analysis model to classify Kenya Airways customer reviews into positive, negative, or neutral sentiments.**

★ **Analyze sentiment distribution across demographics, travel classes, and time periods.**

★ **Identify recurring themes in reviews (e.g., customer service, punctuality, in-flight experience).**

★ **Evaluate and compare sentiment analysis models to determine the most effective one.**

★ **Generate actionable insights to help Kenya Airways improve customer service and address common issues.**

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DATA PREPARATION

DATA UNDERSTANDING

Data Source: Web scraping was conducted from three websites: Trustpilot, AirlineQuality, and AirlineRatings.
Dataset: The combined dataset has **3065 rows** and **5 columns**.
Columns:
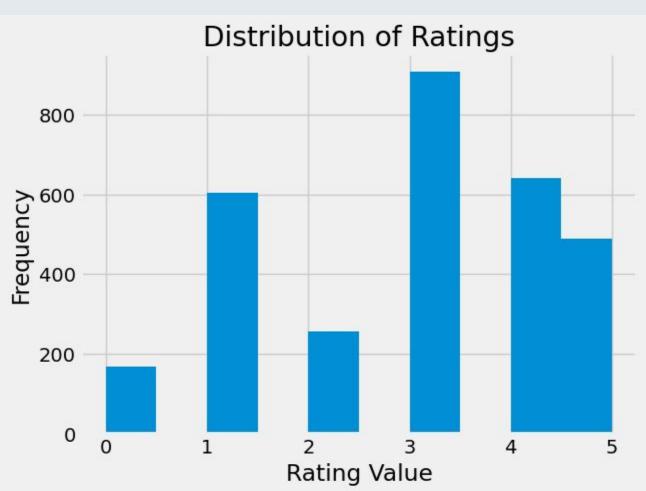
❖ **Departures**: Indicates the departure region or type of flight (e.g., "Africa" or "International").

❖ **Class:** Specifies the travel class (e.g., "Economy" or "Business Class").

❖ **Review:** Contains customer reviews with opinions, complaints, and compliments about Kenya Airways.

❖ **Rating**: Numeric rating from 1.0 (Poor) to 5.0 (Excellent).

❖ **Rating_description:** Textual description of the numeric rating (e.g., "Poor," "Good," "Excellent").

ANALYSIS
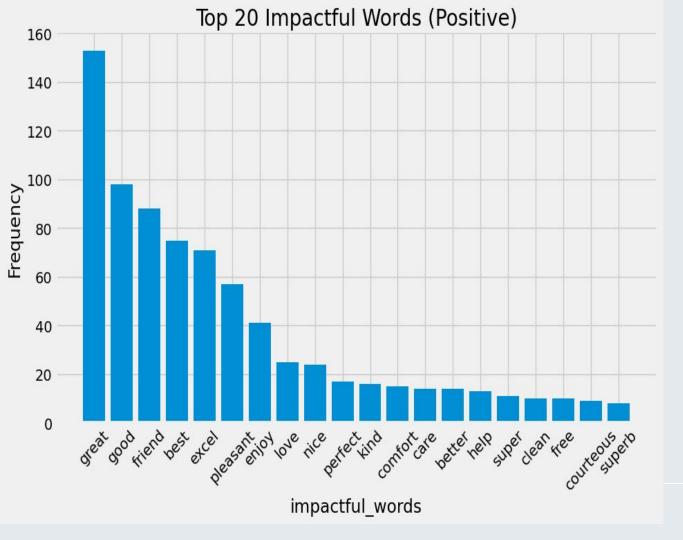
Distribution of Ratings

The distribution of ratings for Kenya Airways indicates a wide range of customer experiences. The majority of customers rate their experience as average (**Rating 3**), but there is a significant number of dissatisfied customers (**Rating 1**). On the positive side, there are also many customers who rated their experience as good (**Rating 4**) or excellent (**Rating 5**), though these are fewer compared to the average and poor ratings.

This distribution suggests that while there is satisfaction among a portion of the customer base, there is a need to address the concerns of those who had poor experiences to improve overall customer satisfaction and reduce the number of average and dissatisfied customers.

Top 20 Impactful Words (Positive)

Positive Sentiment Analysis: The most frequently used positive words in customer reviews include "great," "good," "friend," and "best."

Customer Experience: These words indicate that customers frequently express satisfaction with aspects such as service quality ("great," "good") and interpersonal interactions ("friend," "kind").

Key Insights: The prominence of these words suggests that many customers have had favorable experiences with Kenya Airways, with emphasis on service quality and friendliness.
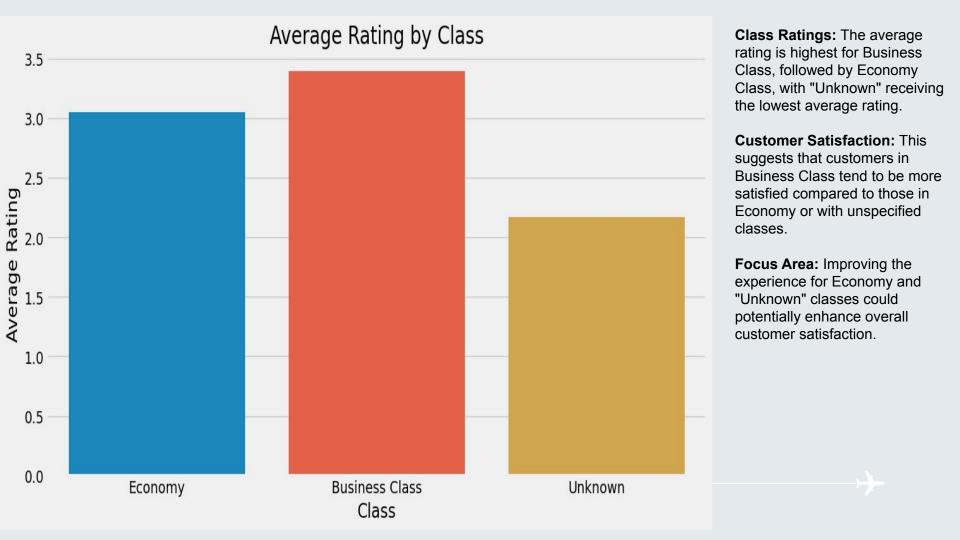
Top 20 Impactful Words Word Cloud (Negative)

complain fail miss delay shame rude wrong worst broken bad problem lost poor cancel fault pay stress disgust avoid disappoint
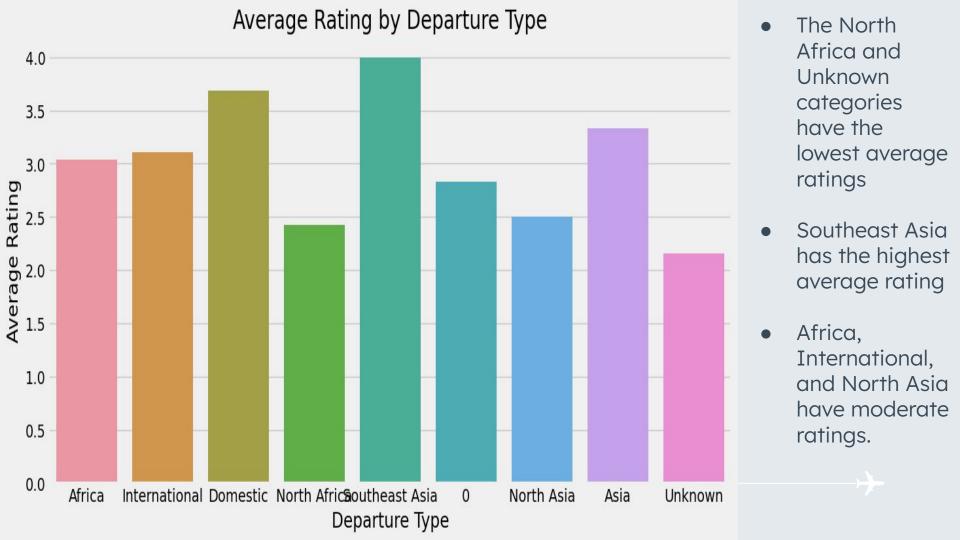
Negative Sentiment Analysis: The most frequently mentioned negative words in customer reviews include "worst," "delay," "poor," "cancel," and "rude."

Customer Complaints: These terms highlight common issues such as flight delays, cancellations, poor service quality, and rude behavior.

Key Insights: The prominence of these words suggests significant dissatisfaction with punctuality, service quality, and customer interactions, indicating areas where Kenya Airways may need to focus on improvements.

Average Rating by Class

Class Ratings: The average rating is highest for Business Class, followed by Economy Class, with "Unknown" receiving the lowest average rating.

Customer Satisfaction: This suggests that customers in Business Class tend to be more satisfied compared to those in Economy or with unspecified classes.

Focus Area: Improving the experience for Economy and "Unknown" classes could potentially enhance overall customer satisfaction.

Average Rating by Departure Type

- The North Africa and Unknown categories have the lowest average ratings

- Southeast Asia has the highest average rating

- Africa, International, and North Asia have moderate ratings.

MODELLING

Models tested ;

- ★ 1.Logistic Regression.
- ★ 2.Random Forest
- ★ 3. SVM model
- ★ 4.KNN model.
- ★ 5. Gradient Boosting
- ★ 6. Adaboost
- ★ 7. Decision tree
- ★ 8. Neural network
- ★ 9. XG Boost

Comparison of Selected Model Performance
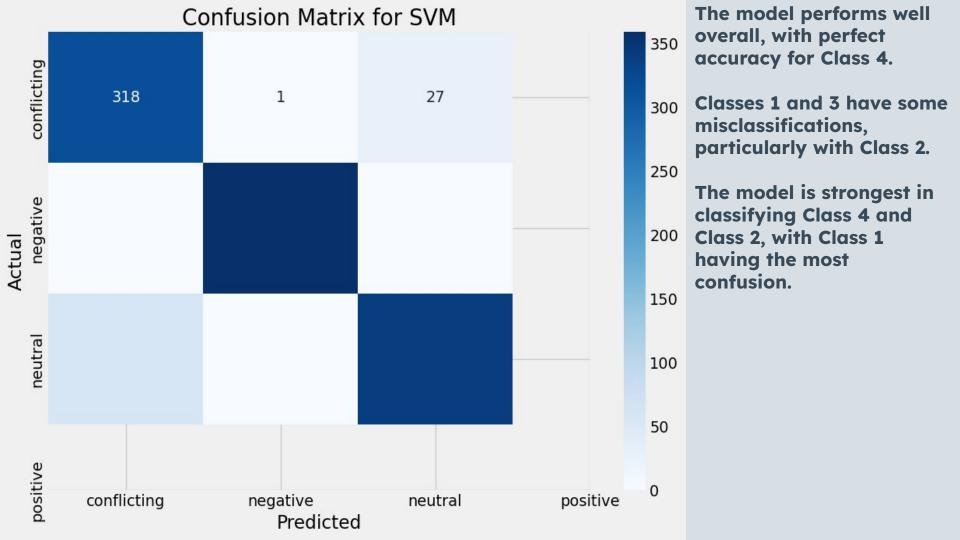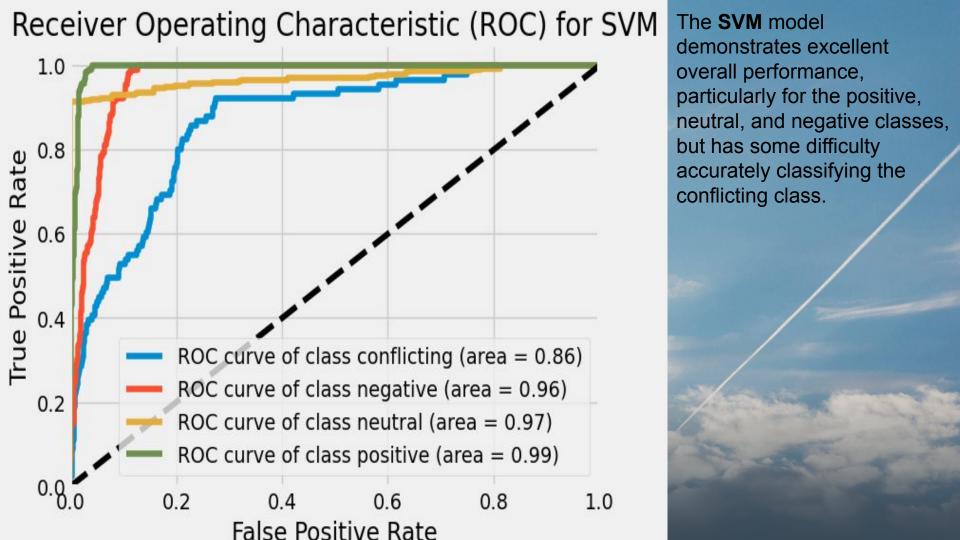
SVM outperforms the other models in terms of Accuracy, making it the best model in this comparison.

This analysis suggests that SVM is likely the most reliable model for the dataset under consideration

Confusion Matrix for SVM

The model performs well overall, with perfect accuracy for Class 4.

Classes 1 and 3 have some misclassifications, particularly with Class 2.

The model is strongest in classifying Class 4 and Class 2, with Class 1 having the most confusion.

Receiver Operating Characteristic (ROC) for SVM

ROC curve of class conflicting (area = 0.86)
ROC curve of class negative (area = 0.96)
ROC curve of class neutral (area = 0.97)
ROC curve of class positive (area = 0.99)

The **SVM** model demonstrates excellent overall performance, particularly for the positive, neutral, and negative classes, but has some difficulty accurately classifying the conflicting class.

MODEL DEPLOYMENT

Our best performing model (SVM model) was integrated with the user interface to enable users to give their review and receive customized feedback (Predicted sentiment)
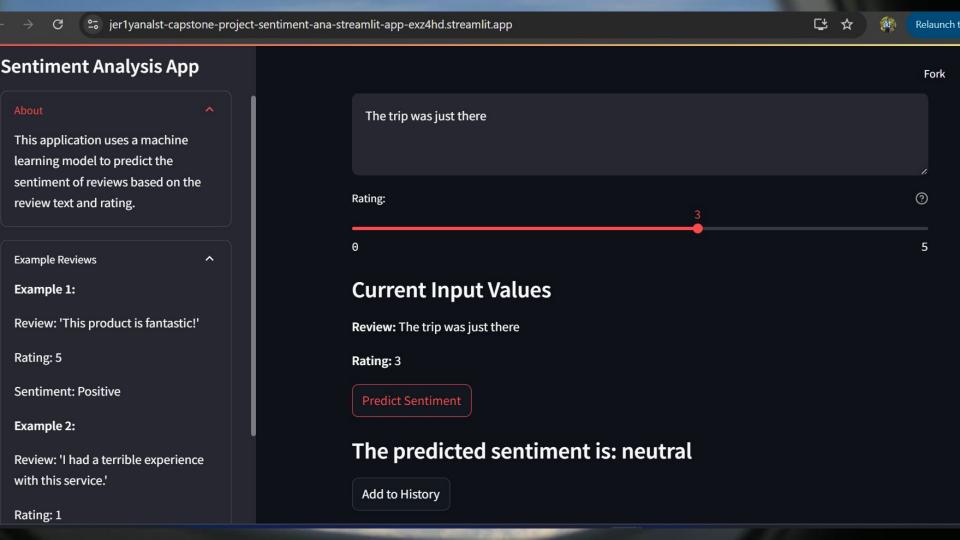
For our deployment we used streamlit that ensures users can easily access the system.

Below is our streamlit app url;

https://jer1yanalst-capstone-project-sentiment-ana-streamlit-app-exz4hd.streamlit.app/

Sentiment Analysis App

Fork

About

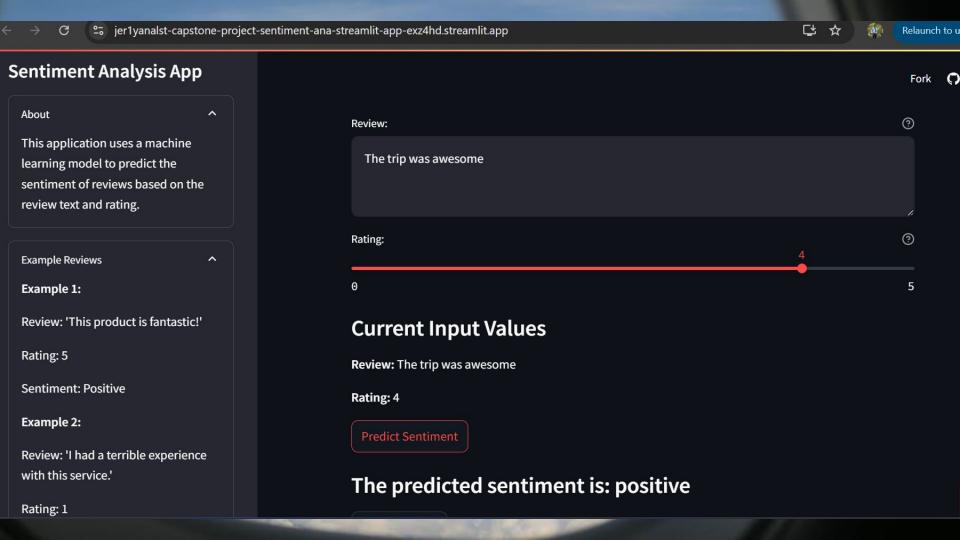This application uses a machine learning model to predict the sentiment of reviews based on the review text and rating.

Example Reviews

Example 1:

Review: 'This product is fantastic!'

Rating: 5

Sentiment: Positive

Example 2:

Review: 'I had a terrible experience with this service.'

Rating: 1

Review:

The trip was awesome

Rating:

4

0   5

Current Input Values

Review: The trip was awesome

Rating: 4

Predict Sentiment

The predicted sentiment is: positive

Relaunch

Sentiment Analysis App

Fork

About ∧

This application uses a machine learning model to predict the sentiment of reviews based on the review text and rating.

Example Reviews ∧

Example 1:

Review: 'This product is fantastic!'

Rating: 5

Sentiment: Positive

Example 2:

Review: 'I had a terrible experience with this service.'

Rating: 1

Review: ⍰

I did not like the seats plus the meals offered

Rating: ⍰

1

0   5

Current Input Values

Review: I did not like the seats plus the meals offered

Rating: 1

Predict Sentiment

The predicted sentiment is: negative

Sentiment Analysis App

Fork

About

This application uses a machine learning model to predict the sentiment of reviews based on the review text and rating.

Example Reviews

Example 1:

Review: 'This product is fantastic!'

Rating: 5

Sentiment: Positive

Example 2:

Review: 'I had a terrible experience with this service.'

Rating: 1

The trip was just there

Rating:

3

0   5

Current Input Values

Review: The trip was just there

Rating: 3

Predict Sentiment

The predicted sentiment is: neutral

Add to History

CONCLUSIONS

1.North Africa : These regions have the lowest average ratings. Kenya Airways should investigate and address the specific issues affecting these areas, focusing on service quality, punctuality, and customer experience.

2.Southeast Asia: With the highest average rating, Kenya Airways should maintain and further enhance services in this region. It can serve as a benchmark for other routes.

3.Class Ratings: The average rating is highest for Business Class, followed by Economy Class, with "Unknown" receiving the lowest average rating. Customer Satisfaction: This suggests that customers in Business Class tend to be more satisfied compared to those in Economy or with unspecified classes.

4.There substantial dissatisfaction expressed by customers regarding flight delays and cancellations underscores a critical issue that demands immediate and strategic intervention.

RECOMMENDATIONS

1. To the marketing department,Use positive feedback from high-performing regions like Southeast Asia and Domestic routes in marketing campaigns to highlight Kenya Airways' commitment to quality service.
2. Improving the experience for Economy and "Unknown" classes could potentially enhance overall customer satisfaction.
3. It is essential to focus on improving the reliability of flight schedules and the efficiency of response mechanisms. Implementing robust measures to reduce delays and cancellations, such as optimizing scheduling, enhancing operational processes, and investing in real-time management systems, will be crucial.
4. Compensation Policies: Review and enhance compensation policies for inconvenienced passengers to rebuild trust and demonstrate commitment to customer satisfaction.

ANY QUESTIONS

THANK YOU !