KENYA AIRWAYS

SENTIMENT
ANALYSIS

WHOA!

MEET OUR TEAM

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TABLE OF CONTENTS

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.**

02

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
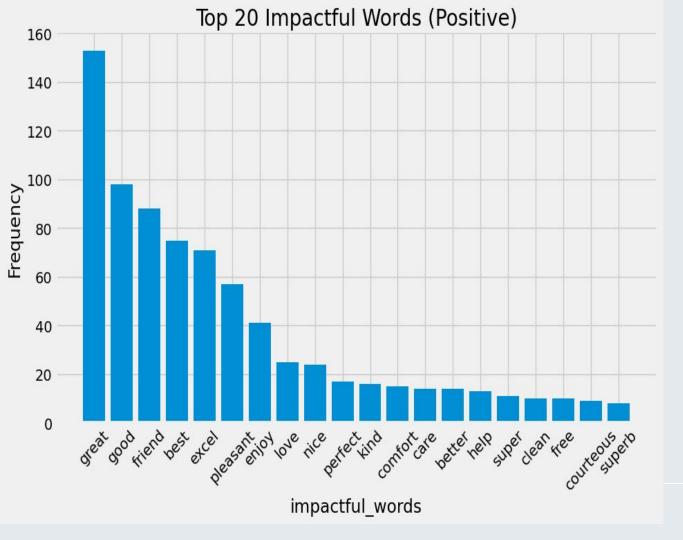
Distribution of Ratings

A majority of ratings cluster around the higher end of the scale, with 4.0 and 5.0 being the most frequent.

This indicates a positive bias in the dataset, as lower ratings are significantly less common.

Such a distribution might suggest high overall customer satisfaction or potential rating inflation.

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.
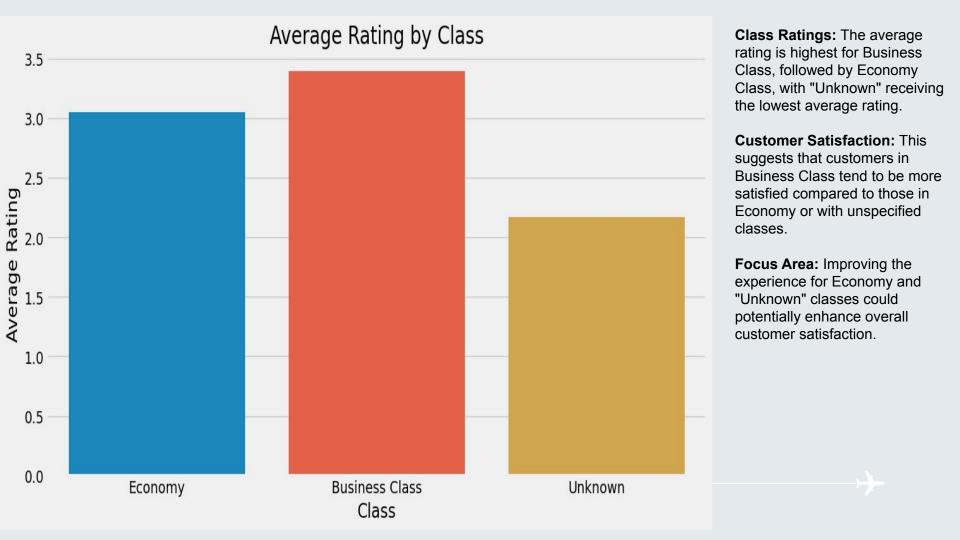
Top 20 Impactful Words Word Cloud (Negative)

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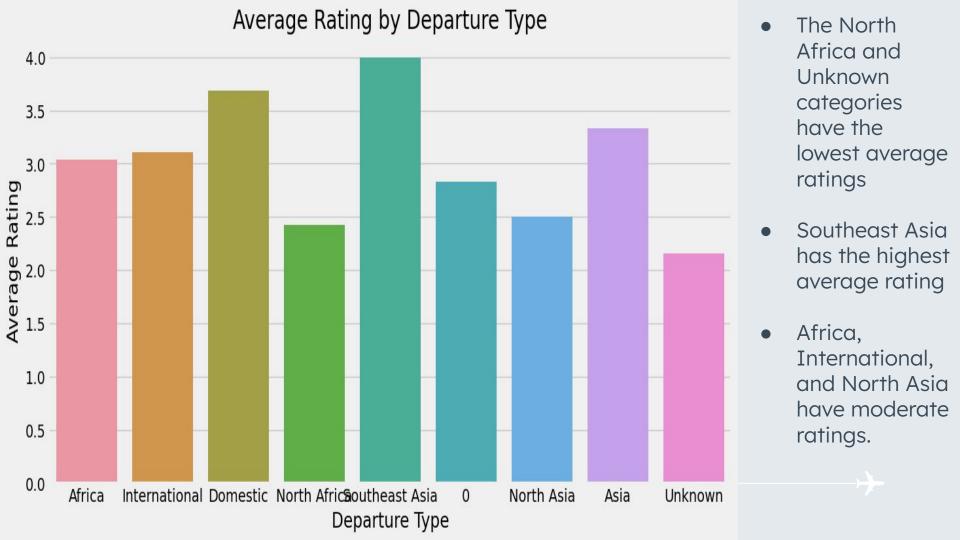
Negative Sentiment Analysis: The most frequently mentioned negative words in customer reviews include "worst," "delay," "poor," "cancel," and "rude."

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.Xgboost Model

★ 4.SVM model.

★ 5. Naive Bayes

Performance Metrics Comparison Across Different Models

Based on the performance metrics, Tuned Logistic Regression is the best model for this particular dataset and task, offering a good balance between Precision, Recall, F1 Score, and Accuracy.

Receiver Operating Characteristic - Multiclass Logistic Regression

The ROC curve analysis shows the multiclass logistic regression model performs exceptionally well in distinguishing between three classes.

Each class's ROC curve is well above the diagonal line representing random guessing, with AUC values of 0.98, 1.00, and 0.98 for classes 0, 1, and 2, respectively.

This indicates strong discriminatory power, particularly for class 1, which the model classifies almost perfectly. Overall, the model demonstrates excellent performance across all classes.
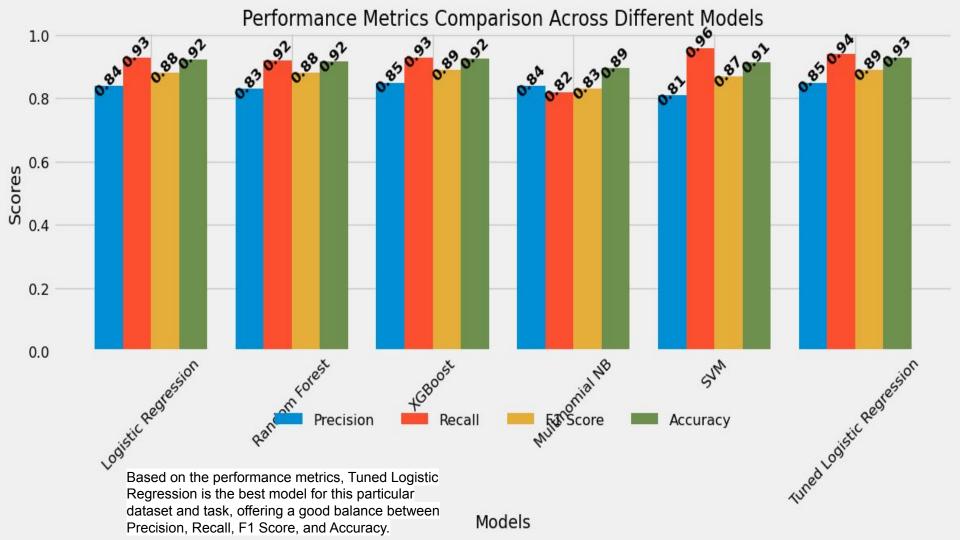
MODEL DEPLOYMENT

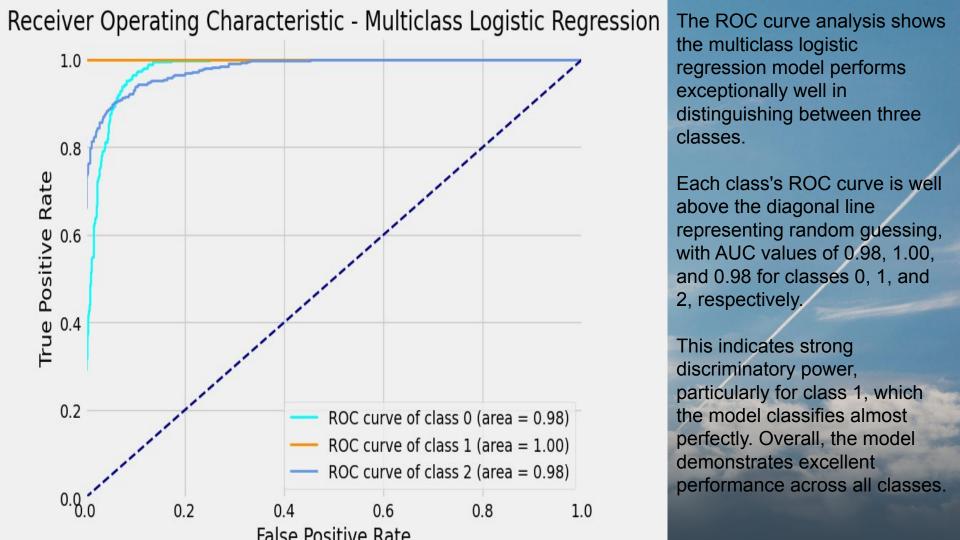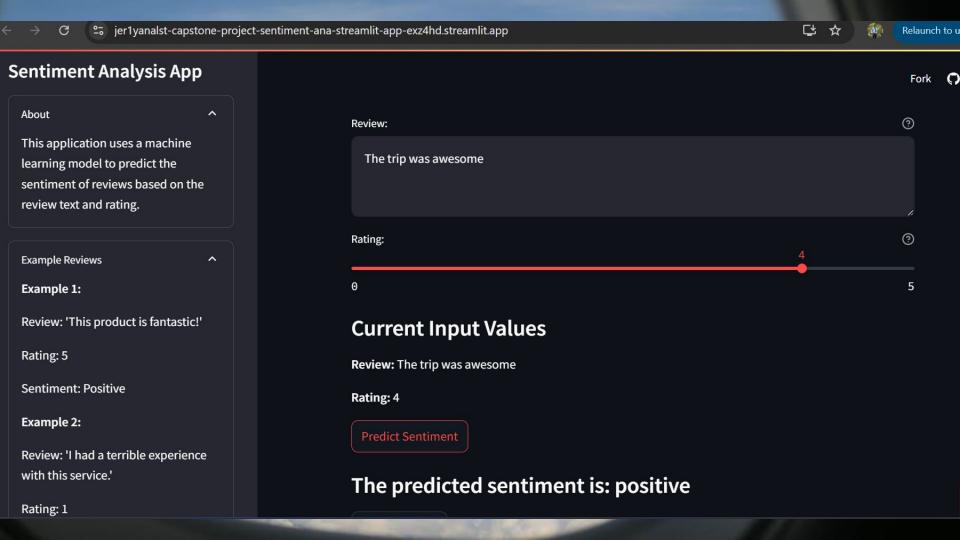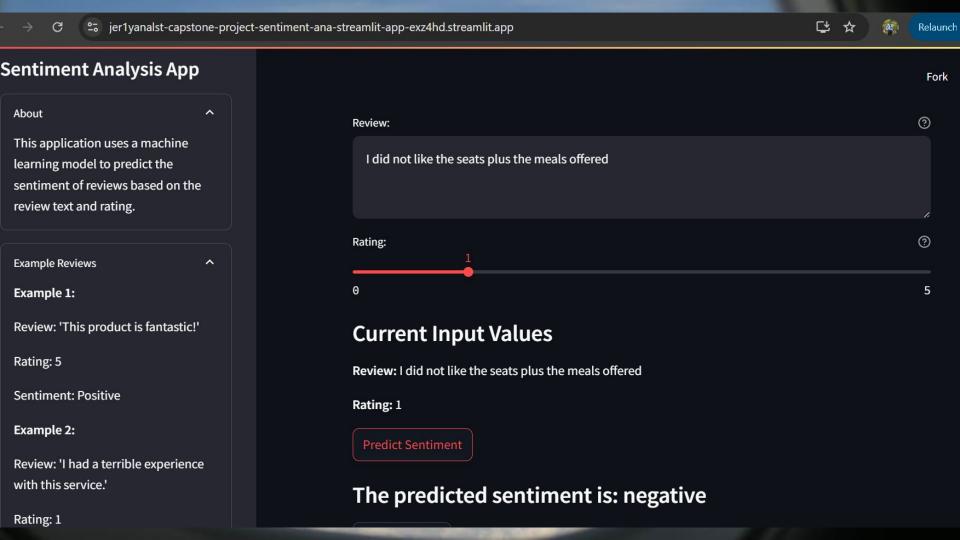Our best performing model (Logistic regression with TF-IDF) was integrated with the user interface to enable users to give their review and receive customized feedback (Predicted sentiment)
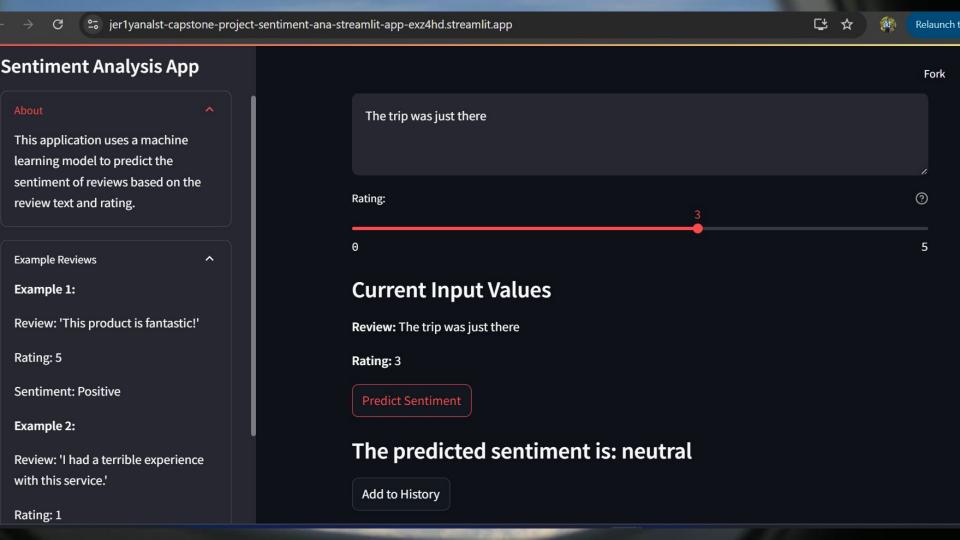
For our deployment we used streamlit that ensures users can easily access the system.

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

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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

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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