



Mini Project

CUSTOMER SENTIMENT ANALYSIS IN TICKETING SYSTEM

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DATA UNDERSTANDING



Data Understanding

About Dataset

The Dataset is a Ticket System Review, it is a Dataset about a survey conducted to the customers from various ticketing platforms such as:

Zendesk, Zoho Desk. Freshdesk, ServiceNow, Jira Service Management, OTRS

Dataset Overview

Each survey response contains the following details:

- Survey ID & Date: A unique identifier for each survey, along with the date it was conducted.
- Ticket System: The specific platform being evaluated.
- Ratings (1-5 Scale): Includes ratings for overall experience, customer service, features, value for money, and ease of use.
- Likelihood to Recommend (NPS, 0-10 Scale): A metric used to assess customer loyalty.
- Customer Reviews: Text-based feedback from users.

Data Understanding

Objectives

To Do Key Metrics Analysis

- Response Rate : Ratio of Customers who Filled the Survey
- Customer Satisfaction Score (CSAT) : Overall Satisfaction of the Customers
- Customer Effort Score (CES) : How much effort is needed from Customers.
- Net Promoter Score (NPS) : Measure Customer Loyalty and Satisfaction
- Sentiment Analysis : Getting Insights from Text.

Additionally, We will be making a **Dashboard** to **Visualize** the Datas to make for an easier **Understanding using Power BI** and see if there are any **Trends or Patterns** within the Data



METHODOLOGY



Data Cleaning

1. Changing Date of Survey to Date and Time Format
2. Making a New Dataset that are only for Customers that Responded to the Survey for Analysis

```
# Convert data type
dataset['date_of_survey'] = pd.to_datetime(dataset['date_of_survey'])
dataset.head()
```

```
# Responded Customer
responded_customer = dataset[ dataset['fill_survey'] == 'Responded'].copy()
responded_customer.head()
```

```
# Check the type of data
dataset.info()
```

[13]

```
... <class 'pandas.core.frame.DataFrame'>
RangeIndex: 1462 entries, 0 to 1461
Data columns (total 10 columns):
#   Column                Non-Null Count  Dtype
---  -
0   id_survey              1462 non-null   object
1   date_of_survey         1462 non-null   object
2   ticket_system          1462 non-null   object
3   overall_rating          787 non-null    float64
4   customer_service        787 non-null    float64
5   features                787 non-null    float64
6   value_for_money         787 non-null    float64
7   ease_of_use             787 non-null    float64
8   likelihood_to_recommend 787 non-null    float64
9   overall_text            787 non-null    object
dtypes: float64(6), object(4)
memory usage: 114.3+ KB
```

Key Metrics Calculation

1. CSAT Score

$$CSAT = \frac{\Sigma \text{total satisfaction score}}{\text{number of responded customer} \times \text{max rating}}$$

The Customer Satisfaction (CSAT) score measures how satisfied customers are with a product or service

1. NPS Score

$$NPS = \frac{\text{Promoter} - \text{Detractor}}{\text{Total Survey Responded}}$$

Net Promoter Score (NPS) is a measure customer loyalty and satisfaction based on how likely customers are to recommend a product or service to others

2. CES Score

$$CES = \frac{\Sigma \text{total effort score}}{\text{number of responded customer} \times \text{max rating}}$$

Customer Effort Score (CES) measures how much effort a customer has to put in to resolve an issue or complete a task to help understand how easy or difficult it is for customers to interact

Sentiment Analysis

```
import re

def cleansing_text(x):
    # clean double whitespace
    out_text = ' '.join(x.split())

    # clean url
    out_text = re.sub(r"http\S+|www\S+|https\S+", 'http', out_text)

    # clean username
    out_text = re.sub(r"@S+", '@user', out_text)

    return(out_text)

cleansing_text(" Doesn't dissapoint. The car      was great. It was the best car rental experiences I've had! Salute to @jone who recommend https:
")
```

Python

"Doesn't dissapoint. The car was great. It was the best car rental experiences I've had! Salute to @user who recommend http"

Next, we will be performing **Sentiment Analysis**, However, in Order to get a better output in our Sentiment Analysis, we will first need to clean the text by **removing double whitespaces, cleaning URLs/websites, and eliminating usernames (commonly found in social media or digital text).**

This ensures that the Sentiment text that we will be using is clean and will be able to be processed better.

Sentiment Analysis

This Sentiment Analysis Model employs sentiment analysis using the Twitter RoBERTa model from Hugging Face, which is specifically trained to detect sentiment in text, especially from platforms like Twitter

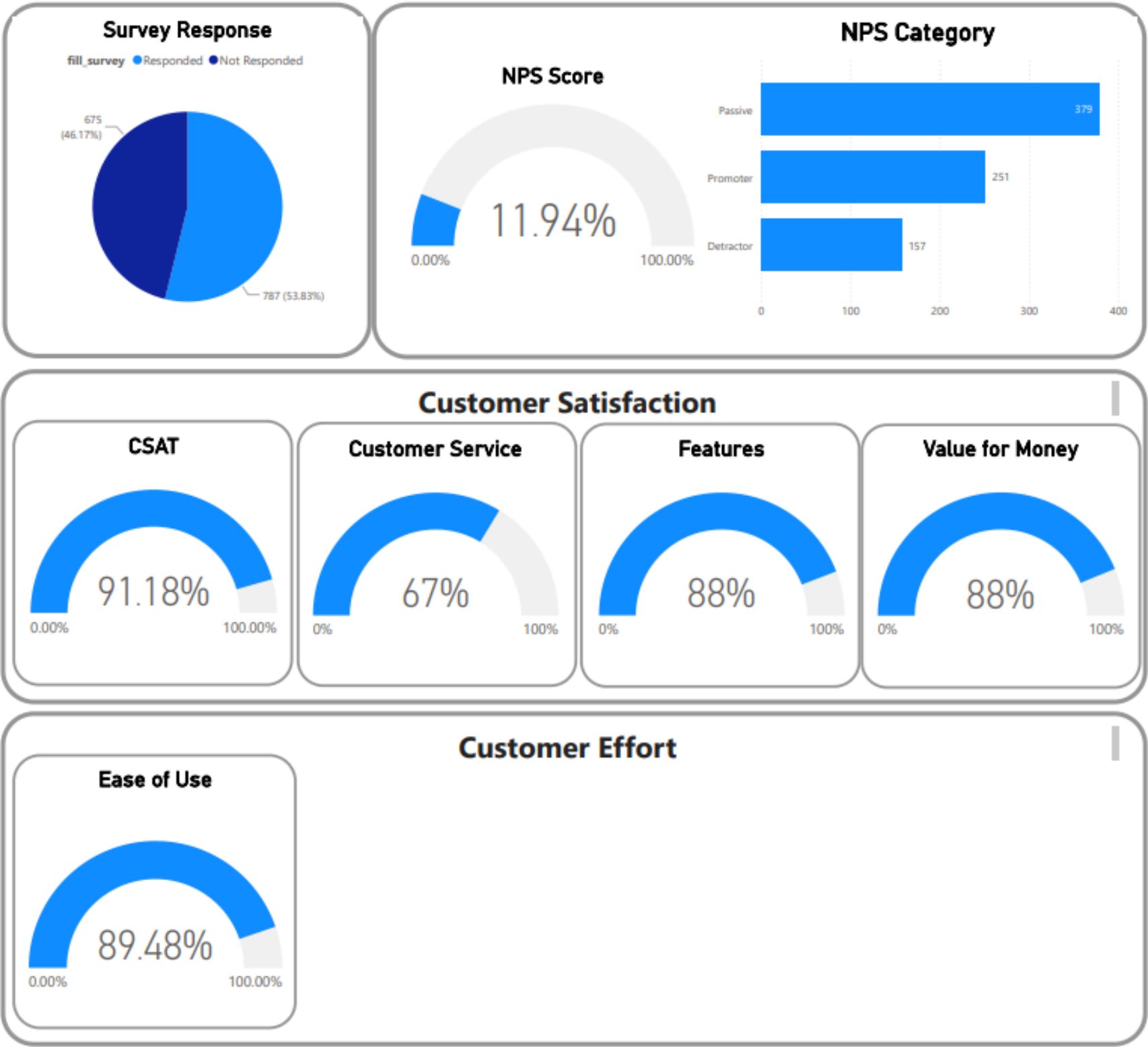
The steps involved in using the Transformers library with the sentiment-analysis pipeline include:

- Classifying text into three categories: Negative (LABEL_0), Neutral (LABEL_1), and Positive (LABEL_2).
- Storing the analysis results in the sentiment_score and sentiment columns.

This methodology is implemented end-to-end, from basic data cleaning to advanced analysis, utilizing machine learning models and major Python libraries such as Pandas for data manipulation and Transformers for natural language processing.

Dashboard

Ticket System Customer Satisfaction Report



Survey by Ticket System

ticket_system	csat	nps	customer_satisfaction	features_satisfaction	Value Satisfaction	Ease_score
Freshdesk	92.08%	24.37%	69%	88%	90%	92.79%
Jira Service Management	91.73%	8.00%	69%	91%	86%	87.73%
otrs	91.11%	22.22%	67%	88%	86%	86.67%
ServiceNow	90.37%	14.81%	64%	86%	84%	84.44%
Zendesk	90.77%	6.33%	67%	87%	85%	87.96%
Zoho Desk	90.76%	7.23%	66%	89%	90%	89.48%
Total	91.18%	11.94%	67%	88%	88%	89.48%

Scores by Time

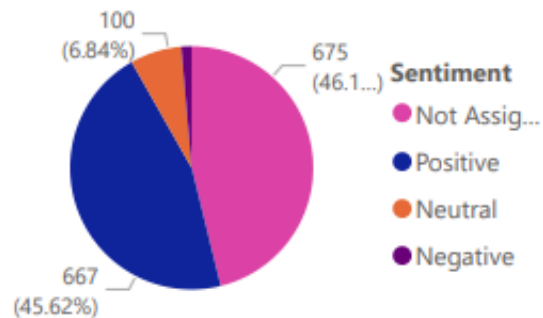


Ticket System Customer Satisfaction Report Dashboard

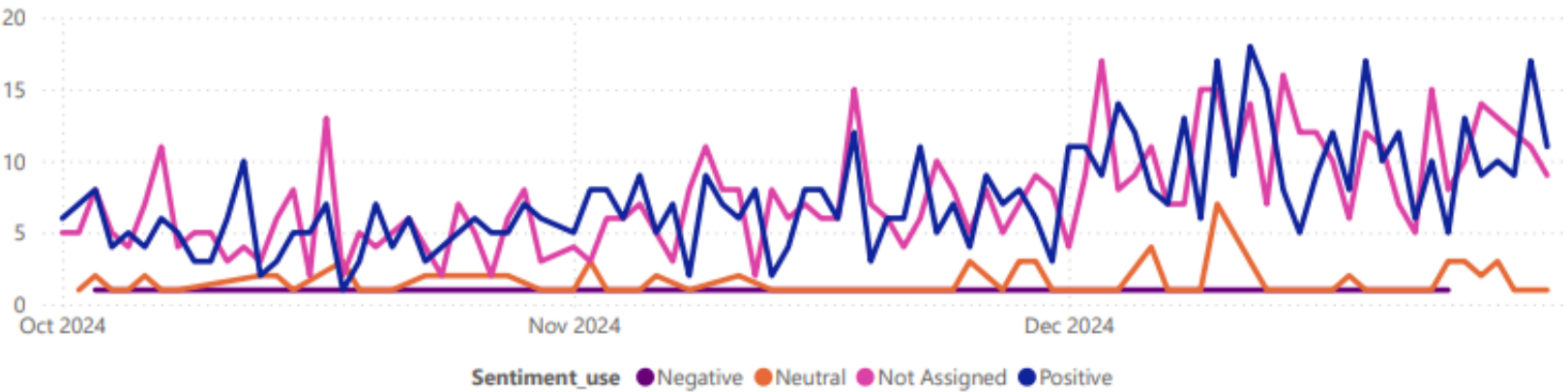
Ticket System Customer Satisfaction Report Dashboard

Ticket System Customer Satisfaction Report

Customer Sentiment

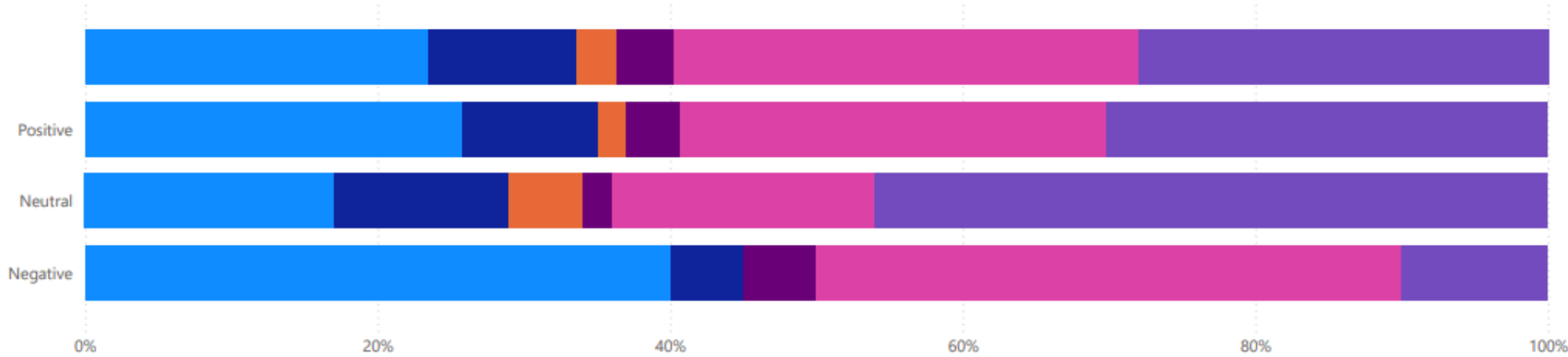


Sentiment Over Time



Sentiment by Ticket System

Ticket System: Freshdesk (blue), Jira Service Management (dark blue), otrs (orange), ServiceNow (purple), Zendesk (pink), Zoho Desk (light purple)





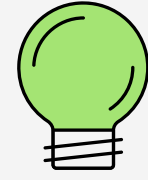
Add Company Name

INSIGHT & RECOMMENDATION

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Insight & Recommendation



The NPS Score is quite low at 11.9%, While it's positive, it's not extremely high, suggesting that there's some room for improvement in customer loyalty and the Customers aren't likely to Recommend the Service to Others.



The CSAT Score at 91.18% shows that the overall satisfaction of the respondents is excellent. The high CSAT is a good indicator that the company is delivering a satisfactory experience to most of its customers.

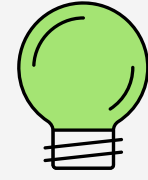


Customer Satisfaction is high overall, with positive feedback on features (88%) and value for money (88%). However, customer service needs improvement, as it received the lowest satisfaction score of 67%, indicating potential areas for enhancement in support and responsiveness



Customer Effort Score at 89.48% suggests that most customers find the product easy to use, with minimal effort required to navigate or operate the system. indicating that the user experience is generally smooth and intuitive, contributing positively to customer satisfaction

Insight & Recommendation



Freshdesk has the highest **NPS score** and **ease of use**, setting a strong benchmark for other ticketing systems to learn from and improve their customer experience and user interface design to see what works best.

Recommendation



Focus on enhancing customer service by addressing **pain points, gathering feedback from detractors to understand their concerns**, and **continuously improving** the product. Additionally, incentivize referrals and optimize the customer onboarding process to increase satisfaction and loyalty.



Maintain Customer Satisfaction, continue delivering a positive customer experience by **ensuring consistent product quality and support**. Monitor feedback to identify any emerging issues and address them proactively.



Improve Customer Service, focus on training and upskilling support staff to **enhance their responsiveness** and problem-solving capabilities. Additionally, consider implementing a **more efficient support system**, such as **live chat or self-service options**, to **address customer issues faster** and increase overall satisfaction.



For **Survey Response Rate**, consider implementing strategies like sending reminder emails to customers who haven't completed the survey, offering incentives for participation, making the survey shorter and easier to complete. also ensure that the survey is easily accessible across different devices and platforms to encourage more customers to respond

Thank You!

For Reading this Presentation

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