**PHASE-1**

**SENTIMENTAL ANALYSIS FOR MARKETING**

**Problem Definition**

**A) Problem Statement**

-> Text often contains a mix of positive, negative, and neutral sentiments, making it challenging to categorize overall sentiment accurately.

->Sentiment in marketing can vary seasonally or due to trends and fads. Sentiment analysis models should account for such variations.

->Marketers often require real-time or near-real-time sentiment analysis to respond swiftly to emerging trends or customer concerns.

**B) Objective**

->Develop a sentiment analysis solution to help marketers gain actionable insights from customer feedback and social media content.

\* Understanding Customer Sentiment

\* Customer Feedback Analysis:

\* Customer Segmentation

\* Identifying Trends

\* Pedictive Analytics

\* Customer Experience Enhancement

**Design Thinking:**

**1. Empathize: Understand Stakeholder Needs**

**->** Conduct interviews and surveys with marketing teams to understand their pain points and goals related to sentiment analysis.

**->** Gather feedback from customers to understand their expectations and how they want brands to engage with their sentiments**.**

**2. Define: Identify the Problem and Scope**

**->** Clearly define the problem you want to solve with sentiment analysis, such as improving customer feedback analysis or monitoring brand reputation.

**->** Set specific objectives and key performance indicators (KPIs) for your sentiment analysis project.

**->** Prioritize and scope the project based on available resources and the most pressing needs.

**3. Prototype: Create Prototypes and Mockups**

**->** Develop prototypes of the sentiment analysis solution, such as sample dashboards or reports.

**->** Use wireframes or mockup tools to visualize the user interface and data presentation.

**->** Test the prototypes with marketing teams and gather feedback on usability and functionality.

**4. Test: Collect Feedback and Iterate**

**->** Conduct usability testing with marketing users and customers to evaluate the effectiveness of the sentiment analysis tool.

**->** Analyze the feedback and identify areas for improvement.

**->** Iteratively refine the prototype based on feedback and insights from testing. **5. Implement: Build and Deploy the Solution**

**->** Develop the sentiment analysis solution, incorporating feedback and

improvements from the prototype phase.

**->** Ensure the solution integrates with relevant data sources and tools used by marketing teams.

**->** Implement necessary data privacy and security measures to protect customer data.

**6. Scale: Expand and Customize**

**->** Once the sentiment analysis solution proves successful, consider expanding its usage to different marketing campaigns, channels, or departments.

**->** Customize the tool to meet the unique requirements of different marketing initiatives.

**7. Educate and Train: Empower Users**

**->** Provide training and resources to marketing teams to maximize their

proficiency with the sentiment analysis tool.

**->** Offer ongoing support and educational materials to ensure effective

utilization.

**->** Applying design thinking to sentiment analysis in marketing can lead to more user-centric and effective solutions, enhancing customer satisfaction, improving brand perception, and driving marketing success. Remember to keep the focus on empathy, user feedback, and iterative improvement throughout the process.

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**PHASE-2**

**Project Scope and Objectives:**

**Project Scope:**

The scope of the sentiment analysis project in marketing encompasses the following key aspects:

**1.Data Sources:**

The project will focus on collecting and analyzing data from various online sources, including social media platforms, review websites, blogs, and forums, to capture consumer sentiments related to the company's brand, products, or services.

**2.Sentiment Classification:**

The project will implement natural language processing and machine learning techniques to classify sentiments as positive, negative, or neutral, as well as identify specific emotions or aspects influencing sentiment (e.g., joy, anger, satisfaction, product quality, customer service).

**3.Real-time Monitoring:**

The sentiment analysis system will be designed to provide real-time monitoring capabilities, allowing for immediate responses to emerging trends and issues in consumer sentiment.

**4.Competitor Analysis:**

In addition to analyzing the company's own sentiment, the project will consider sentiment analysis of key competitors to gain a comparative advantage and understand market dynamics.

**5.Report and Visualization:**

The project will generate clear, actionable reports and visualizations, making it easy for marketing teams to interpret and act upon the sentiment analysis results.

**Project Objectives:**

The objectives of the sentiment analysis project in marketing are as follows:

**1.Consumer Insights:**

Gain a deeper understanding of consumer perceptions, preferences, and attitudes toward the company's products and services, enabling more targeted marketing campaigns.

**2.Issue Detection:**

Detect and address potential issues, concerns, or negative sentiment early on to prevent reputational damage and improve customer satisfaction.

**3.Trend Identification:**

Identify emerging trends, topics, and conversations within the market to capitalize on opportunities or adapt marketing strategies proactively.

**4.Real-time Response:**

Enable marketing teams to respond swiftly to sentiment fluctuations by implementing timely adjustments to campaigns, customer service, or product offerings.

**5.ROI Improvement:**

Improve return on investment (ROI) by aligning marketing efforts more closely with customer sentiment and preferences.

**6.Enhanced Customer Engagement:**

Use sentiment analysis to enhance customer engagement by tailoring content and interactions based on consumer sentiments and emotions.

**Detailed Project Plan:**

Developing a detailed plan for sentiment analysis in marketing involves a structured approach to collecting, analyzing, and leveraging sentiment data. Below is a step-by-step plan that outlines the key stages of such a project:

**1. Project Initiation:**

Define Project Goals: Clearly articulate the objectives and expected outcomes of the sentiment analysis project in the context of your marketing strategy.

**Identify Stakeholders:** Determine the key team members and stakeholders involved, including marketing, data analysts, and IT professionals.

**2. Data Collection:**

**Data Sources:** Specify the online platforms and sources from which you will collect data, such as social media, review websites, blogs, and forums.

**Data Collection Tools**: Choose appropriate data scraping or API tools to collect text data from these sources.

**Data Preprocessing:** Clean and preprocess the data to remove noise, irrelevant information, and duplicates.

**3. Sentiment Analysis Model:**

**Select Tools and Libraries:** Choose natural language processing (NLP) libraries and machine learning frameworks like NLTK, spaCy, or scikit-learn.

**Model Training:** Develop or select a pre-trained sentiment analysis model for classifying text into positive, negative, or neutral sentiments.

**Customization:** Fine-tune the model to align with the nuances and specific language relevant to your industry or brand.

**4. Real-time Monitoring:**

Implement a system for real-time data collection and analysis, allowing for immediate response to sentiment fluctuations.

Set up alerts or triggers for specific sentiment thresholds or emerging trends.

**5. Competitor Analysis:**

Define competitors and identify their online presence.

Apply sentiment analysis techniques to competitor data to benchmark and gain competitive insights.

**6. Visualization and Reporting:**

Create dashboards and visualizations to present sentiment analysis results in an understandable and actionable format.

Generate regular reports for marketing and management teams, highlighting key findings and trends.

**7. Response Mechanism:**

Develop a structured process for responding to the sentiment analysis insights, including the role and responsibilities of team members.

Implement a feedback loop to track the effectiveness of responses and adjust

**Conclusion:**

Sentiment analysis in marketing empowers businesses to make data-driven decisions, enhance brand perception, and stay ahead in the competitive digital landscape.

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**PHASE-3**

**Introduction:**

Sentiment analysis is a valuable tool in marketing for understanding how customers perceive your brand, products, or services. It helps you gauge the sentiment expressed in customer feedback, social media mentions, reviews, and other forms of user-generated content. By analyzing sentiment, you can uncover valuable insights that can inform your marketing strategies and decision-making processes.

**Steps followed:**

* **Data collection**
* **Data processing**
* **Sentiment analysis techniques**
* **Sentiment labelling**
* **Visualization**
* **Analysis and insights**
* **Actionable steps**
* **Continuous monitoring**
* **Feedback loop**
* **Compliance and ethics**

Sentiment analysis is a natural language processing (NLP) task that involves determining the sentiment or emotion expressed in a piece of text.

In the context of marketing, sentiment analysis can be used to gauge customer opinions, reviews, or social media comments about a product or brand.

To perform sentiment analysis in Python for marketing purposes, we follow these steps

* **Install the necessary libraries** if you haven't already. You can use popular NLP libraries like NLTK or spaCy, but one of the easiest ways to get started is by using the **textblob** library, which is built on NLTK.

**COMMAND:** **pip install textblob**

* **SAMPLE CODE:**

from textblob import TextBlob

# Sample text for analysis

text = "I love this product! It's amazing."

# Create a TextBlob object

blob = TextBlob(text)

# Get sentiment scores

polarity = blob.sentiment.polarity # Sentiment polarity (-1 to 1)

subjectivity = blob.sentiment.subjectivity # Subjectivity (0 to 1)

# Determine sentiment based on polarity

if polarity > 0:

sentiment = "Positive"

elif polarity < 0:

sentiment = "Negative"

else:

sentiment = "Neutral"

# Print the results

print(f"Text: {text}")

print(f"Sentiment: {sentiment}")

print(f"Polarity: {polarity}")

print(f"Subjectivity: {subjectivity}")

**Output:**

**Text: I love this product! It's amazing.**

**Sentiment: Positive**

**Polarity: 0.6000000000000001**

**Subjectivity: 0.9**

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**PHASE-4**

**Introduction:**

Sentiment analysis is a valuable tool in marketing for understanding how Customers perceive your brand, products, or services.

It helps you gauge the Sentiment expressed in customer feedback, social media mentions, reviews, and other forms of user-generated content.

By analyzing sentiment, you can uncover Valuable insights that can inform your marketing strategies and decision-making Processes.

**DATASET LINK:**[**https://www.kaggle.com/datasets/crowdflower/twitter-airline-sentiment**](https://www.kaggle.com/datasets/crowdflower/twitter-airline-sentiment)

**DATACARD:**









**EDA on One Piece Reviews:**

<https://www.kaggle.com/datasets/crowdflower/twitter-airline-sentiment>

In this notebook I will perform a simple EDA on the dataset I gathered from IMDB on the reviews on first ever successful live action of an anime "One Piece Live Action". Is this live action successful or not we will find out after the EDA

**SAMPLE CODE:**

import pandas as pd

import numpy as np

from matplotlib import pyplot as plt

import seaborn as sns

data=pd.read\_csv("/kaggle/input/one-piece-live-action-imdb-reviews/reviews.csv")

data.head()

data.shape()

data.info()

data.isna().sum()

data['Rating']=data['Rating'].fillna(data['Rating'].mean())

print('Average rating on One piece live adaption is ',data['Rating'].mean())

value\_counts = data['Rating'].value\_counts()

value\_counts()

data['Rating'].value\_counts().plot.bar(title='Rating Graph of One Piece Live Action')

data['Review'][0]

sent\_data=pd.read\_csv('/kaggle/input/twitter-airline-sentiment/Tweets.csv')

sent\_data.head()

columns=['tweet\_id', 'airline\_sentiment\_confidence',

'negativereason', 'negativereason\_confidence', 'airline',

'airline\_sentiment\_gold', 'name', 'negativereason\_gold',

'retweet\_count', 'tweet\_coord', 'tweet\_created',

'tweet\_location', 'user\_timezone']

def clean\_text(text):

text = text.lower()

text = nltk.word\_tokenize(text)

text = [t for t **in** text if len(t) > 1]

text = [stemmer.stem(word) for word **in** text if word **not** **in** stopwords]

text = ' '.join(text)

return text

from sklearn.feature\_extraction.text import CountVectorizer

cv = CountVectorizer(max\_features=20000)

X = cv.fit\_transform(sent\_data['text']).toarray()

y=sent\_data["airline\_sentiment"].to\_numpy()

y

print(np.unique(y))

print(np.bincount(y))

**SAMPLE OUTPUT:**

(878, 4)

Title 0

Review 0

Date 0

Rating 8

dtype: int64

Rating

10.000000 432

9.000000 171

8.000000 93

7.000000 52

5.000000 27

1.000000 27

6.000000 26

3.000000 17

2.000000 13

4.000000 12

8.517241 8

Name: count, dtype: int64







Guy mess seating. reserve seat friend guy gave seat away ... want free internet'

array([0, 2, 0, ..., 0, 1, 0])

"Being a one piece fan myself, I was a bit insecure about starting the series but boy do I never got off my bed through all these 8 episodes. The Live Adaptation is way beyond my expectations and I seriously cried and laughed along every emotional and comforting moment. NETFLIX PLEASE RELEASE SEASON 2. The portrayal of Monkey D Luffy was perfect as well as other characters. Every Episode had its own main character and the introduction to each and every straw pirate crew was done with utmost respect and love 💕. Can't wait for more pirate crew members to be introduced in the later seasons especially Nico Robin."

0 Title 878 non-null object

1 Review 878 non-null object

2 Date 878 non-null object

3 Rating 870 non-null float64

dtypes: float64(1), object(3)

memory usage: 27.6+ KB

Rating

10.000000 432

9.000000 171

8.000000 93

7.000000 52

5.000000 27

1.000000 27

6.000000 26

3.000000 17

2.000000 13

4.000000 12

8.517241 8

Name: count, dtype: int64

'@VirginAmerica you guys messed up my seating.. I reserved seating with my friends and you guys gave my seat away ... 😡 I want free internet'

**NLP TECHNIQUES:**

NLP technology is used in a variety of applications including:

* Digital assistants such as Siri.
* Speech-to-text dictation software.
* Voice-operated GPS systems.
* Customer service chatbots.
* Predictive text.
* Digital voicemail.
* Autocorrect.
* Search autocomplete.
* Email filters.

**CONCLUSION:**

The benefits of sentiment analysis include the following: Collecting large amounts of unstructured data from various sources. Tracking real-time customer feedback and sentiment about an organization's brand, products and services. Providing feedback on ways to improve products, services and customer experience.

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**About Dataset**

A sentiment analysis job about the problems of each major U.S. airline. Twitter data was scraped from February of 2015 and contributors were asked to first classify positive, negative, and neutral tweets, followed by categorizing negative reasons (such as "late flight" or "rude service").

**SOURCE CODE:**

Import pandas as pd

data = pd.read\_csv('Finance\_data.csv')

#Pre-Prcoessing and Bag of Word Vectorization using Count Vectorizer

from sklearn.feature\_extraction.text import CountVectorizer

from nltk.tokenize import RegexpTokenizer

token = RegexpTokenizer(r'[a-zA-Z0-9]+')

cv = CountVectorizer(stop\_words='english',ngram\_range = (1,1),tokenizer = token.tokenize)

text\_counts = cv.fit\_transform(data['sentences'])

#Splitting the data into trainig and testing

from sklearn.model\_selection import train\_test\_split

X\_train, X\_test, Y\_train, Y\_test = train\_test\_split(text\_counts, data['feedback'], test\_size=0.25, random\_state=5)

#Training the model

from sklearn.naive\_bayes import MultinomialNB

MNB = MultinomialNB()

MNB.fit(X\_train, Y\_train)

#Caluclating the accuracy score of the model

from sklearn import metrics

predicted = MNB.predict(X\_test)

accuracy\_score = metrics.accuracy\_score(predicted, Y\_test)

print("Accuracuy Score: ",accuracy\_score)

**OUTPUT:**

Accuracuy Score: 0.9111675126903553

**CONCLUSION:**

Our understanding and knowledge about sentiment analysis and its solutions remain very limited. The main reason is that this is a NLP task, and NLP has no easy problems. Another reason may be due to the popular ways of doing research, which rely too much on machine learning.