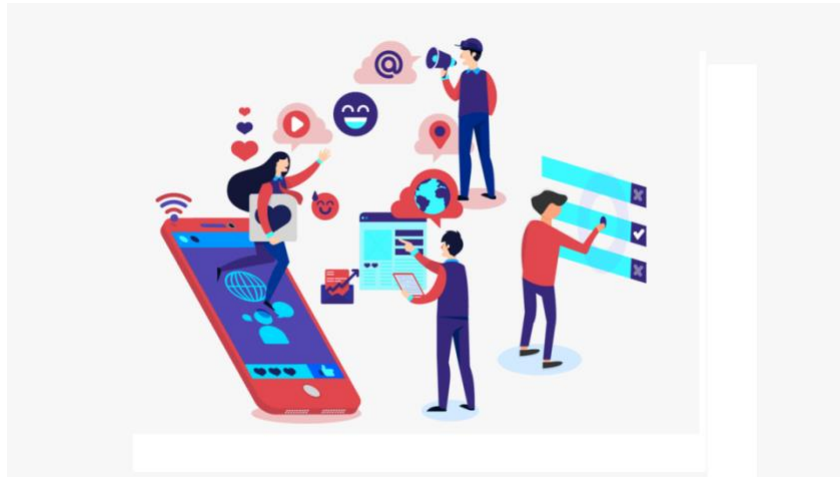


Phase 1: Problem Definition and Design Thinking

Project Title: **SENTIMENT ANALYSIS FOR MARKETING**

Problem definition:



- **Sentiment Analysis:** Sentiment analysis, a branch of NLP, involves using algorithms to determine the sentiment or emotional tone behind a piece of text. In this context, customer feedback, which can be in the form of reviews, comments, or survey responses, is analyzed to classify sentiments as positive, negative, or neutral. This analysis provides a quantitative measure of how customers perceive a competitor's product.
- **Identifying Strengths and Weaknesses:** Through sentiment analysis, companies can identify specific aspects of a competitor's product that customers appreciate (strengths) and aspects that lead to dissatisfaction (weaknesses). Positive sentiments might indicate features customers love, excellent customer service, or overall satisfaction. Conversely, negative sentiments could highlight areas needing improvement such as product quality, customer support issues, or pricing concerns.
- **Competitive Benchmarking:** By comparing the sentiment analysis results of their competitor's products with their own, companies gain a clear benchmark. This benchmarking allows them to understand where they stand in the market in terms of customer satisfaction and what aspects of their own product they need to work on to be more competitive.

- **NLP Methods:** Various NLP techniques are employed for this analysis. These include tokenization (breaking down text into words or phrases), part-of-speech tagging (identifying the grammatical parts of each word), and named entity recognition (identifying entities such as product names). Additionally, advanced techniques like sentiment lexicons, machine learning algorithms (such as Naive Bayes, Support Vector Machines), and deep learning models (like Recurrent Neural Networks) are used to perform nuanced sentiment analysis.
- **Extracting Actionable Insights:** The ultimate goal of this sentiment analysis is to extract actionable insights. These insights can inform product development, marketing strategies, and customer service initiatives. For instance, if customers consistently praise a competitor's user-friendly interface, a company might invest in improving their own product's user experience. On the other hand, if customers express dissatisfaction with the competitor's customer support, the company might emphasize their superior customer service in their marketing campaigns.

Design Thinking:

1. Data Collection:

- ❖ Identify a dataset containing customer reviews and sentiments about competitor products.
- ❖ **Dataset Link:** <https://www.kaggle.com/datasets/crowdflower/twitter-airline-sentiment>

2. Data Preprocessing:

1. Clean and preprocess the textual data to prepare it for analysis. This step involves tasks like removing special characters, converting text to lowercase, and handling missing or irrelevant data. Cleaning the data ensures that the subsequent analysis is based on accurate and consistent information.

3. Sentiment Analysis Techniques:

Employ different Natural Language Processing (NLP) techniques for sentiment analysis:

2. Bag of Words: Represent the text data as a bag of words, disregarding grammar and word order. This method simplifies the text into a collection of words, enabling sentiment analysis based on word frequency.
3. Word Embeddings: Use pre-trained word embeddings like Word2Vec or GloVe to represent words as high-dimensional vectors. This captures semantic relationships between words and enhances the analysis's understanding of context.
4. Transformer Models: Utilize transformer-based models like BERT or GPT to capture complex contextual information. These models excel in understanding the context of words in a sentence, leading to more accurate sentiment analysis results.

4.Feature Extraction:

- ❖ Extract features and sentiments from the preprocessed text data. Features can include specific keywords, phrases, or aspects mentioned in the reviews. Sentiments are derived through the chosen sentiment analysis techniques, categorizing reviews as positive, negative, or neutral based on the content's emotional tone.

5.Visualization:

- ❖ Create visualizations to depict the sentiment distribution and analyze trends within the dataset. Visual representations such as bar charts, pie charts, or heatmaps can illustrate the proportion of positive, negative, and neutral sentiments. Time-based visualizations or word clouds can also reveal trends and common themes within the reviews.

6.Insights Generation:

- ❖ Gather feedback by testing the model with dataset and integrate them to the marketing systems.
- ❖ Translate the sentiment analysis results into actionable insights for marketing strategies.
- ❖ Continuously assess the performance and identify the areas for improvement based on customer feedback.

FLOW CHART:

