**Sentiment Analysis of Twitter Data**

*Project Report*

*Submitted in partial fulfilment of the requirement*

*For*

*BCA*

*Under the guidance*

*Of*

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**Minor Project**

**BCA-505P**

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Date:

**Signature**

Abhishek

*Introduction*

* **Sentiment analysis** is the automated process of analyzing text data and sorting it into sentiments positive, negative, or neutral.
* Using sentiment analysis tools to analyze opinions in Twitter data can help companies understand how people are talking about their brand.
* With [more than 321 million active users, sending a daily average of 500 million Tweets](https://learn.g2.com/twitter-statistics), Twitter allows businesses to reach a broad audience and connect with customers without intermediaries. On the downside, it’s harder for brands to quickly detect negative content, and if it goes viral you might end up with an unexpected PR crisis on your hands.
* [**Sentiment analysis**](https://monkeylearn.com/sentiment-analysis/) (also known as ***opinion mining***) is the automated process of identifying and extracting the subjective information that underlies a text. This can be either an opinion, a judgment, or a feeling about a particular topic or subject. The most common type of sentiment analysis is called ‘polarity detection’ and involves classifying a statement as ‘positive’, ‘negative’, or ‘neutral’.
* For example, let’s take this sentence*: “I don’t find the app useful: it’s really slow and constantly crashing”.* A sentiment analysis model would automatically tag this as *Negative*.
* By analyzing social media posts, product reviews, customer feedback, and NPS responses (among other unstructured data), businesses can understand how their customers *feel* about their product or service.
* Sentiment analysis is particularly useful for social media monitoring because it goes beyond the number of likes or retweets, by providing qualitative insights.
* **R** and **Python (**DBMS tools**)** are widely used for Sentiment Analysis of dataset Twitter.

## *Why Is Twitter Sentiment Analysis important?*

## These are some of the main advantages of Twitter sentiment analysis:-

1. **Real-Time Analysis:** Twitter sentiment analysis is essential for monitoring sudden shifts in customer moods, detecting if complaints are on the rise, and for taking action before problems escalate. With sentiment analysis, you can monitor brand mentions on Twitter in real-time and gain valuable insights that tell you if you need to make updates.
2. **Scalability:** let’s say you need to analyze hundreds of tweets mentioning your brand. While you could do that manually, it would take hours of manual processing, and as your data grows it would be impossible to scale. By performing Twitter sentiment analysis you can automate manual tasks and gain valuable insights in a very short time.
3. **Consistent Criteria:** analyzing sentiment in a text is subjective. When done manually.  The same tweet may be viewed differently by two members of the same team. By training a machine learning model to perform sentiment analysis on Twitter data, you can use one set of criteria to analyze all your data, so results are consistent.

***Objectives***

**Why Twitter Sentiment Analysis:**

Sentiment Analysis Dataset Twitter has a number of applications:

1. **Business**: Companies use Twitter Sentiment Analysis to develop their business strategies, to assess customers’ feelings towards products or brand, how people respond to their campaigns or product launches and also why consumers are not buying certain products.
2. **Politics**: In politics Sentiment Analysis Dataset Twitter is used to keep track of political views, to detect consistency and inconsistency between statements and actions at the government level. Sentiment Analysis Dataset Twitter is also used for analyzing election results.
3. **Public Actions**: Twitter Sentiment Analysis also is used for monitoring and analyzing social phenomena, for predicting potentially dangerous situations and determining the general mood of the blogosphere.

***Data Flow Diagram (DFD)***

**Lavel-0 DFD :-**

Fetching Tweets (Enter #tags and no of tweets)

Analysis

()k

Result (Positive, Negative and Neutral ) in Pie chart

**Lavel-1 DFD :-**

Processing of Classified Data

Result (Positive, Negative and Neutral) on Pie Chart in Graphical Form

Classification of Data

Fetch Tweets Data

Tokenization

Remove Stop Words

Data Cleaning

***ANALYSIS***

***Feasibility Analysis****:-*

**Feasibility Analysis** is an assessment of the practicality of a proposed project or system.A feasibility study aims to objectively and rationally uncover the strengths and weaknesses of an existing business or proposed venture, opportunities and threats present in the natural environment, the resources required to carry through, and ultimately the prospects for success. In its simplest terms, the two criteria to judge feasibility are cost required and value to be attained. A well-designed feasibility study should provide a historical background of the business or project, a description of the product or service, accounting statements, details of the operations and management, marketing research and policies, financial data, legal requirements and tax obligations. Generally, feasibility studies precede technical development and project implementation.

A feasibility study evaluates the project's potential for success; therefore, perceived objectivity is an important factor in the credibility of the study for potential investors and lending institutions. It must therefore be conducted with an objective, unbiased approach to provide information upon which decisions can be based.

The purpose behind a **project feasibility study** is to know the different variables involved with your business venture and how it will be accepted on the open market along with who will be the target audience.

In a projects lifecycle, the project feasibility study is the second document that is created following the business case. The purpose of this study is to determine the factors that will make the business opportunity that was presented in the business case a success.

Included in the project feasibility study will be the exploration of the main focus of the business opportunity along with the alternative paths it could follow. By collecting this data, management can then make an informed decision on which path should be pursued in order to create the most profitable revenue stream for the company.

The objective of the feasibility study is to establish the reasons for developing the software that is acceptable to users, adaptable to change and conformable to established standards. Various other objectives of feasibility study are listed:-

* To analyze whether the software will meet organizational requirements
* To determine whether the software can be implemented using the current technology and within the specified budget and schedule
* To determine whether the software can be integrated with other existing software.

**TYPES OF FEASIBILITY REPORT**

Various types of feasibility that are commonly considered include technical feasibility, operational feasibility, and economic feasibility.

* ***TECHNICAL FEASIBILITY:-***

My project “Twitter Sentiment Analysis” is technically Feasible since all the required tools were easily available. Python and PyCharm software was easily handled. Although every tool and language was easily available and handled efficiently, there were challenges too.

Technical feasibility assesses the current resources (such as hardware and software) and technology, which are required to accomplish user requirements in the software within the allocated time and budget. For this, the software development team ascertains whether the current resources and technology can be upgraded or added in the software to accomplish specified user requirements. Technical feasibility also performs the following tasks.

* Analyzes the technical skills and capabilities of the software development team members.
* Determines whether the relevant technology is stable and established.
* Ascertains that the technology chosen for software development has a large number of users so that they can be consulted when problems arise or improvements are required.
* ***OPERATIONAL FEASIBILITY:-***

Simply stated, this test of feasibility asks if the system will work when it is developed and installed. Are there major barriers to implementation? The purpose was to make a simplified web application and “Twitter Sentiment Analysis” is simpler to operate and can be used in any webpage. It is free and not costly to operate only it requires proper high speed internet connection.

Operational feasibility assesses the extent to which the required software performs a series of steps to solve business problems and user requirements. This feasibility is dependent on human resources (software development team) and involves visualizing whether the software will operate after it is developed and be operative once it is installed. Operational feasibility also performs the following tasks.

* Determines whether the problems anticipated in user requirements are of high priority
* Determines whether the solution suggested by the software development team is acceptable
* Analyzes whether users will adapt to a new software
* Determines whether the organization is satisfied by the alternative solutions proposed by the software development team.
* ***ECONOMIC FEASIBILITY:-***

“Twitter Sentiment Analysis” is a web based application and creation of it doesn’t incur large cost. Basically created with very low cost and gives huge benefits to the top management. Some benefits are like better decisions making and timelines of information, better documentation and record keeping, faster retrieval of information.

Economic feasibility determines whether the required software is capable of generating financial gains for an organization. It involves the cost incurred on the software development team, estimated cost of hardware and software, cost of performing feasibility study, and so on. For this, it is essential to consider expenses made on purchases (such as hardware purchase) and activities required to carry out software development. In addition, it is necessary to consider the benefits that can be achieved by developing the software. Software is said to be economically feasible if it focuses on the issues listed below.

* Cost incurred on software development to produce long-term gains for an organization
* Cost required to conduct full software investigation (such as requirements elicitation and requirements analysis)
* Cost of hardware, software, development team, and training.

*SYSTEM SOFTWARE REQUIREMENT SPECIFICATION (SRS)*

Below are the requirements used for running **TWITTER SENTIMENT ANALYSIS**

**System Requirement**

Download JetBrains PyCharm Community Edition 2019.2 x64

<https://www.jetbrains.com/pycharm/download/download-thanks.html?platform=windows&code=PCC>

**Windows-Based Requirements**

* Dual-core 64-bit processor
* 8 GB of memory
* Up to 24 GB of internal storage ( PyCharm: 2.5GB+1GB for caches,)
* Windows 10, Windows 8.1 Update, Windows 8, and Windows 7.1

**Library Requirements of PyCharm Platform**

* Textblob(simple, pythonic text processing, Sentiment Analysis, part of speech tagging, noun phrase parsing)
* Tweepy(twitter library for Python)
* Matplotlib(Python plotting package)
* NLTK corpora (Corpora is nothing but a large and structured set of texts

**Future Scope of the Project**

Sentiment analysis is a uniquely powerful tool for businesses that are looking to measure attitudes, feelings and emotions regarding their brand. To date, the majority of sentiment analysis projects have been conducted almost exclusively by companies and brands through the use of social media data, survey responses and other hubs of user-generated content. By investigating and analyzing customer sentiments, these brands are able to get an inside look at consumer behaviors and, ultimately, better serve their audiences with the products, services and experiences they offer.

The future of sentiment analysis is going to continue to dig deeper, far past the surface of the number of likes, comments and shares, and aim to reach, and truly understand, the significance of social media interactions and what they tell us about the consumers behind the screens. This forecast also predicts broader applications for sentiment analysis – brands will continue to leverage this tool, but so will individuals in the public eye, governments, nonprofits, education centers and many other organizations.

## Deeper, Broader Insights from Sentiment Analysis

Sentiment analysis is getting better because social media is increasingly more emotive and expressive. A short while ago, Facebook introduced “Reactions,” which allows its users to not just ‘Like’ content, but attach an emotion, whether it be a heart, a shocked face, angry face, etc. To the average social media user, this is a fun, seemingly silly feature that gives him or her a little more freedom with their responses. But, to anyone looking to leverage social media data for sentiment analysis, this provides an entirely new layer of data that wasn’t available before. Every time the major social media platforms update themselves and add more features, the data behind those interactions gets broader and deeper.

## Greater Personalization for Audiences

As a result of deeper and better understanding of the feelings, emotions and sentiments of a brand or organization’s key, high-value audiences, members of these audiences will increasingly receive experiences and messages that are personalized and directly related to their wants and needs. Rather than segment markets based on age, gender, income and other surface demographics, organizations can further segment based on how their audience members actually feel about the brand or how they use social media. While some people shudder at the thought of companies learning more about them, more exact targeting means that, in the near future, we will no longer be scratching our head wondering why we see advertisements for products we’d never dream of purchasing. In other words, the spray-and-pray advertising tactics are almost put to rest and there will be a time when every marketing message we see will be relevant and useful to us. Sentiment analysis is going to be a large contributing factor towards ach0ieving this vision.

## Not Just For Marketers and Brands

Again, sentiment analysis is on the verge of breaking into new areas of application. While we will likely always think of it first in terms of the traditional marketing sense, the world has already seen a few ways that sentiment analysis can be used in other areas. Social media analytics helped predict and explain the emotions of concerned parties behind Brexit and the 2016 US election, which has spurred a number of non-brand organizations to investigate how sentiment analysis can be used to predict outcomes and map out the emotional landscape of people, voters and the like. Additionally, businesses are looking at ways that sentiment analysis can be used outside of their marketing and PR departments. Sentiment analysis simply looks more popular in the future.

## Algorithm-Based Sentiment Analysis Plateaus

Algorithms have long been at the foundation of most forms of analytics, including social media and sentiment analysis. With recent years bringing big leaps in machine learning and artificial intelligence, many analytics solutions are looking to these technologies to replace algorithms. Unfortunately for organizations looking to leverage sentiment analysis to measure audience emotions, machine learning isn’t yet ready to tackle the complex nuances of text and how we talk, especially on social media channels that are rife with slang, sarcasm, double meanings and misspellings. These make it difficult for artificial intelligence systems to accurately sort and classify sentiments on social media. And, with any analysis project, accuracy is crucial. It is uncertain if machine learning will progress to the point that it is capable of accurately analyzing text, or if sentiment analysis projects will have to find a new basis to avoid the current plateau of algorithms. Some social media analytics solutions have begun taking a more human approach to deciphering the often ambiguous nature of text, but this can be time consuming.