

**SOCIAL AND NETWORK ANALYSIS OF TWEETS FROM  
TWITTER(Sentiment Analysis)**

Project report submitted in partial fulfillment of the requirement for  
the degree of Bachelor of Technology

**In Computer Science and Engineering/Information Technology**

By

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## Certificate

### Candidate's Declaration

We hereby declare that the work presented in this report entitled "A SOCIAL AND NETWORK ANALYSIS OF TWEETS FROM TWITTER(SENTIMENT ANALYSIS)" in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering/Information Technology submitted in the department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology, Waknaghat is an authentic record of our own work carried out over a period from January 2020 to May 2020 under the supervision of Dr. RuchiVerma(AssistantProfessor(Senior Grade), Computer Science and Engineering And Information Technology).The matter embodied in the report has not been submitted for the award of any other degree or diploma.



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This is to certify that the above statement made by the candidate is true to the best of my knowledge.



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## **Abstract**

In today's world Social media is play a very vital role in our life. What we can think, what we do,we all express our feelings on social media platform.Social media is a big, interactive medium for discussion of various issues related to society as well as important for the increasing spread of information, especially during times of natural disasters, calamities and mass emergencies. Also on social media people talk about the products that are launched day by day. Many companies and organization use these type of information (related to their products) to know what the people think about their product. They can analyze this information using Social Network Analysis.

Interactions through social media platforms are very distributed not centralized to a particular location, time zone etc. Social media provides a quick and powerful way to spread data not matter whether it is accurate or inaccurate, spread of the either kind is favourable. However social network generally favoured more accurate and valid information to spread than false information and rumoured data. Interaction occurs in real time so this provides relevant spread of data in accordance to relevant data.

We use sentiment analysis to know the behavior of people towards a particular product. Also how it changes from product to product day by day.Sentiment analysis is the identification and classification of emotions whether it is positive, negative or neutral using text analysis technique.Sentiment analysis allows companies and organizations to identify customer sentiments towards their products, brands, services in online conversation and through feedback. Sentiment analysis uses the texts that is written by a particular person on social media to analyze whether it is positive, negative or neutral.The basic task of sentiment analysis to find the polarity of the given opinion on social media. Sentiment analysis is used to analyze

whether a person is happy about the product, sad about the product or neutral about the product by analyzing their opinions or statements on social media.

At last we get the graphs through which we can identify sentiments of people towards different products by comparing them.

# CHAPTER 1

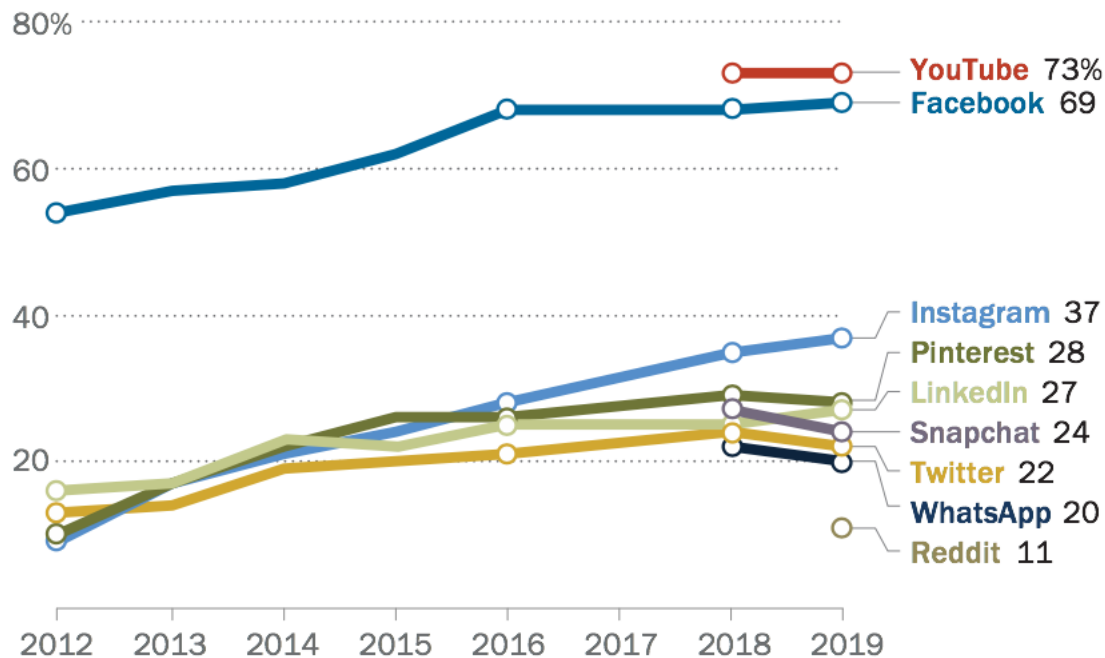
## 1.1 INTRODUCTION

- In today's world Social media is play a very vital role in our life. What we can think, what we do, we all express our feelings on social media platform.Social media is a big, interactive medium for discussion of various issues related to society as well as important for the increasing spread of information, especially during times of natural disasters, calamities and mass emergencies. Also on social media people talk about the products that are launched day by day. Many companies and organization use these type of information (related to their products) to know what the people think about their product. They can analyze this information using Social Network Analysis.
- Various social networking media like Instagram, Facebook, Twitter etc. play a vital role in information spread about the situation of devastation and damage caused to life and property.
- Interactions through social media platforms are very distributed not centralized to a particular location, time zone etc. Social media provides a quick and powerful way to spread data not matter whether it is accurate or inaccurate, spread of the either kind is favourable. However social network generally favoured more accurate and valid information to spread than false information and rumoured data. Interaction occurs in real time so this provides relevant spread of data in accordance to relevant data.



## Facebook, YouTube continue to be the most widely used online platforms among U.S. adults

*% of U.S. adults who say they ever use the following online platforms or messaging apps online or on their cellphone*



Note: Pre-2018 telephone poll data is not available for YouTube, Snapchat and WhatsApp.

Comparable trend data is not available for Reddit.

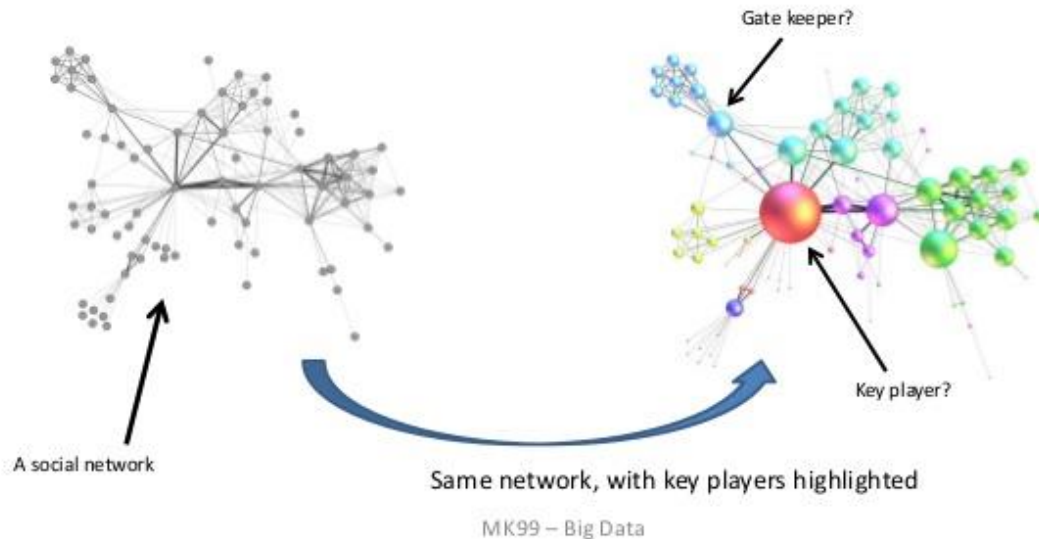
Source: Survey conducted Jan. 8-Feb. 7, 2019.

**PEW RESEARCH CENTER**

Fig1.1 Shows most widely used online platform by people

- Also Social media play a very vital role in information spread of products and all.
- Social Network Analysis is commonly used by marketers to track online conversations about products and companies.
- In this project we understand the relationship between the networks on social media. Who are the key players?

# Finding key players



11

Fig 1.2 Show the key players in social networks

- We use sentiment analysis to know the behavior of people towards a particular product. Also how it changes from product to product day by day.
- Sentiment analysis is the identification and classification of emotions whether it is positive, negative or neutral using text analysis technique.
- Sentiment analysis allows companies and organizations to identify customer sentiments towards their products, brands, services in online conversation and through feedback.
- Sentiment analysis uses the texts that is written by a particular person on social media to analyze whether it is positive, negative or neutral.
- The basic task of sentiment analysis to find the polarity of the given opinion on social media. Sentiment analysis is used to analyze whether a person is happy about the product, sad about the product or neutral about the product by analyzing their opinions or statements on social media.



Fig1.3 Show the sentiments of people

Loves the German bakeries in Sydney. Together with my imported honey it feels like home	Positive
@VivaLaLauren Mine is broken too! I miss my sidekick	Negative
Finished fixing my twitter...I had to unfollow and follow everyone again	Negative
@DinahLady I too, liked the movie! I want to buy the DVD when it comes out	Positive
@frugaldougal So sad to hear about @OscarTheCat	Negative
@Mofette brilliant! May the fourth be with you #starwarsday #starwars	Positive
Good morning thespians a bright and sunny day in UK, Spring at last	Positive
@DowneyisDOWNEY Me neither! My laptop's new, has dvd burning/ripping software but I just can't copy the files somehow!	Negative

Fig1.4 Show the positive and negative statements of people.

## 1.2PROBLEM STATEMENT

### *Social Network Analysis of tweets from twitter(Sentiment Analysis).*

- When any company launches their product it is important for them to have the information like what people think about their product, their services, about their brands.
  
- For example, If company launches a phone. After the launch of the phone many people do not like it. So they share their opinions on various social media platforms about the phone. Company should know about this. How the company knows about it. Obviously through Sentiment analysis.
  
- So that they can analyze all the opinions. Only then they can improve their products, services.
  
- Sentiment analysis is important because every company or organization does not want that their brand value comes down.
  
- They always thinking about how they can higher their brand value day by day.

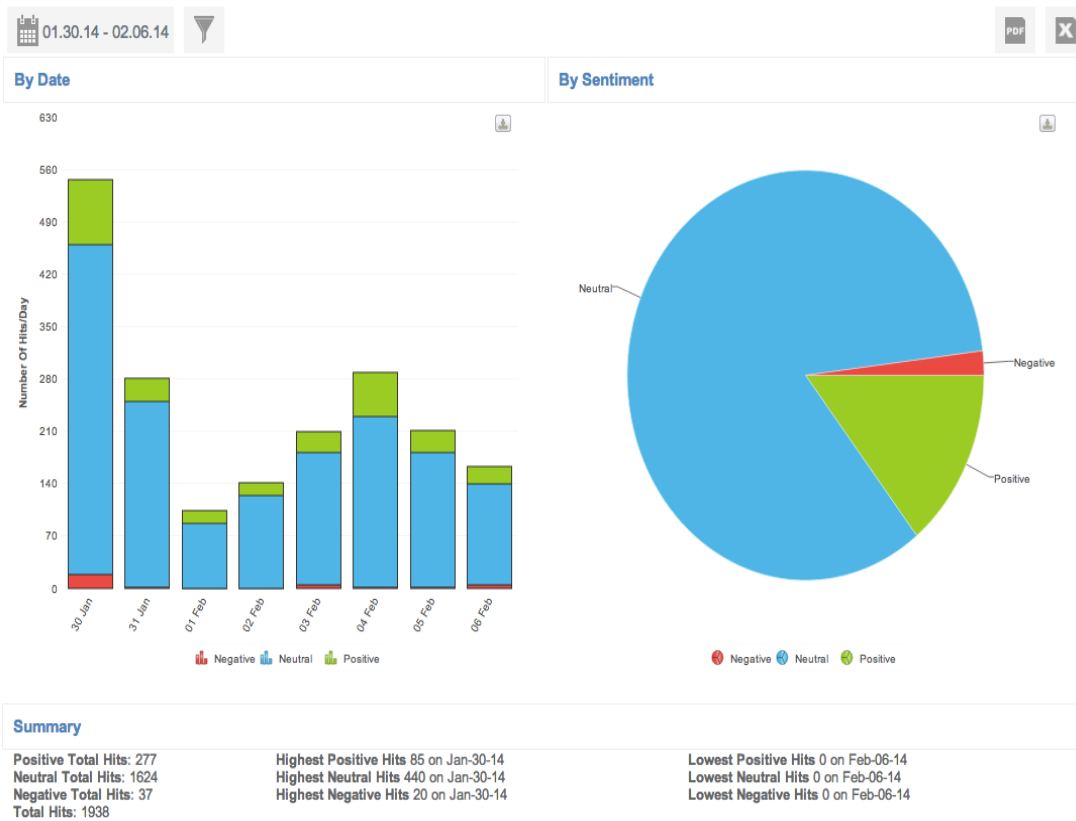


Fig1.5 Show the graph of sentiments of people for a particular product.

- Sentiment analysis use Natural Language Processing to analyze the opinions or statements of people towards the products, services or brands of a particular company or organization.
- Net sentiment score and brand passion index show how user feel about company's product. After knowing this company also compare it with the competitor's product.
- Sentiment analysis uses the texts that is written by a particular person on social media to analyze whether it is positive, negative or neutral.

- The basic task of sentiment analysis is to find the polarity of the given opinion on social media. Sentiment analysis is used to analyze whether a person is happy about the product, sad about the product or neutral about the product by analyzing their opinions or statements on social media.

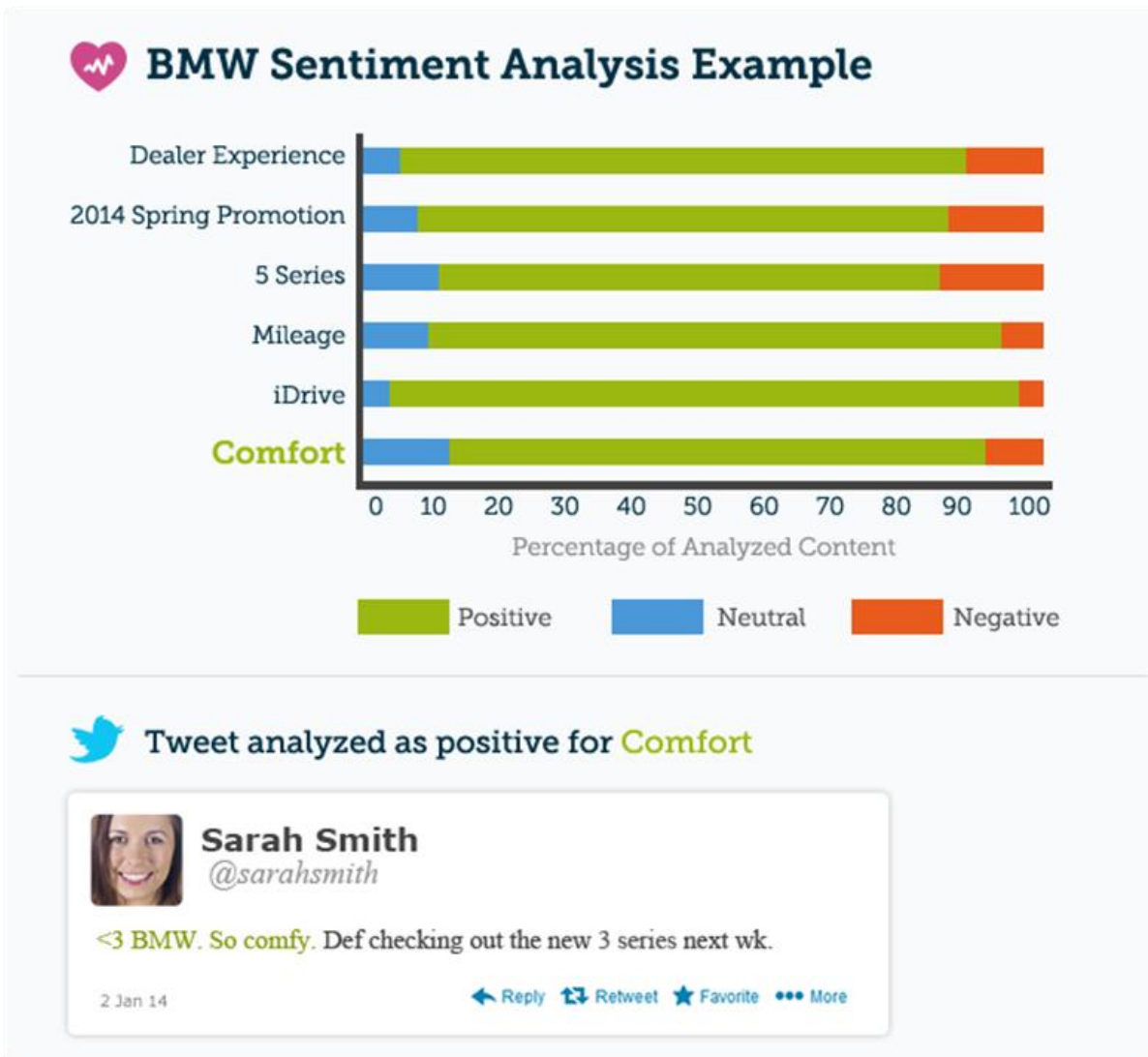


Fig1.6 Show BMW sentiment analysis.

### 1.3 OBJECTIVES

Social media is a very big and interactive platform for discussion of various issues relevant in society. Social network analysis is used for business purposes. Various social networking media like Instagram, facebook, twitter etc. play a very important role in information spread. Sometimes it also trend various keywords related to the product that is recently launched, brand or services.

Interactions through social media platforms are very distributed not centralized to a particular location, time zone etc. Social media provides a quick and powerful way to spread data not matter whether it is accurate or inaccurate, spread of the either kind is favourable. However social network generally favoured more accurate and valid information to spread than false information and rumoured data. Interaction occurs in real time so this provides relevant spread of data in accordance to relevant data.

Social network analysis is a sociological method of interpreting patterns of various relationships and interactions among social actors and social groups to find out the basic structure like information about nodes, hubs, leaders, highly connected groups, poorly connected groups, degree of centrality etc.

This study proposes to:

- Examine the role of social media when company or any organization launches a product, service or any brand.
- Analyzing the online social behavior of communities after the launch.
- To find out the efficiency of the active key players in communicating information.
- Analyzing the spread of type of data that was important.
- Understand that the information we got is helpful for sentiment analysis or not.
- To get the graphs of sentiments whether it is positive, negative or neutral. Then compare it with the sentiment analysis of another product to see towards which product people react positively.



## 1.4 METHODOLOGY

We follow these steps in our project:

- Authorize twitter API client. Create a twitter application. Some part of the recent tweets of twitter is accessed through twitter search API. The collected tweets are then filtered for the usage in research work. For performing all the given tasks creation for a twitter application is necessary.
  
- In order to fetch tweets through Twitter API, one needs to register an App through their twitter account. Follow these steps for the same:
  - ‘Create New App’ in twitter.
  - Then fill the application form. You can leave the callback url field empty.
  - Once the app is created, then you will be directly forwarded to the app page.
  - Open the ‘Keys and Access Tokens’ tab.
  - Copy ‘Consumer Key’, ‘Consumer Secret’, ‘Access token’ and ‘Access Token Secret’.
- Then step involves the procedure of extraction of data from social media platforms. Here, we extract the data from a popular social networking site called as Twitter. The tweets are related to views of different people about the products, services or brands.
  
- For this process of extraction of data, a script is written in the programming language of python. Pycharm is installed and python script for data extraction is written. For data extraction from Twitter, we have to create a Twitter Developer account.

- The formation of this Twitter Developer Account leads to the group of a unique API (Application Program Interface). An API helps a programmer to make assured requests to the operating system using a command interface.
  
- Upon registration by the user in twitter, a key and a secret key are given which are required for application certification. The authentication process is started with the help of these keys, which are used to make a twitter tie. The twitter confirms the user's character and issues a pin called verifier. This pin is compulsory for all twitter application.
  
- Twitter offers access to public tweets through two key elements of its Application Programming Interface (API): the search API and the streaming API. Of these, the search API can be secondhand to repossess past tweets according to a range of conditions (including keywords/hash tags, location, etc.), within set boundaries.
  
- The search API will only return very less number of tweets.Only with the use of this unique API, we can get the data from Twitter.For extracting data of a particular event or keyword, a combination of hash tags is used like (#iphone, #samsung)
  
- The conspiratorial of statistics and metrics telling the Twitter activities taken in a given dataset trusts mainly on processing these datasets to total and compare specific expansive patterns, further filtering of datasets for specific users, or keywords may also be required.
  
- We can code the particular program in python language which retrieve the data from the twitter and also give us the graphs. After getting these graphs we can compare these with each other.

- After the run it ask us to enter the keyword of which we want the information. Then it asks us how many of tweets you want to fetch from twitter related to this keyword.
  
- Then it give us the data. Data contains the information like how many people react positive, how many people react negative towards the product, how many people reacts neutral towards the product. It gives the percentage of positive responses, negative responses, or neutral responses.
  
- It also gives us the graph or pie chart of the percentage of positive responses, negative responses, or neutral responses.

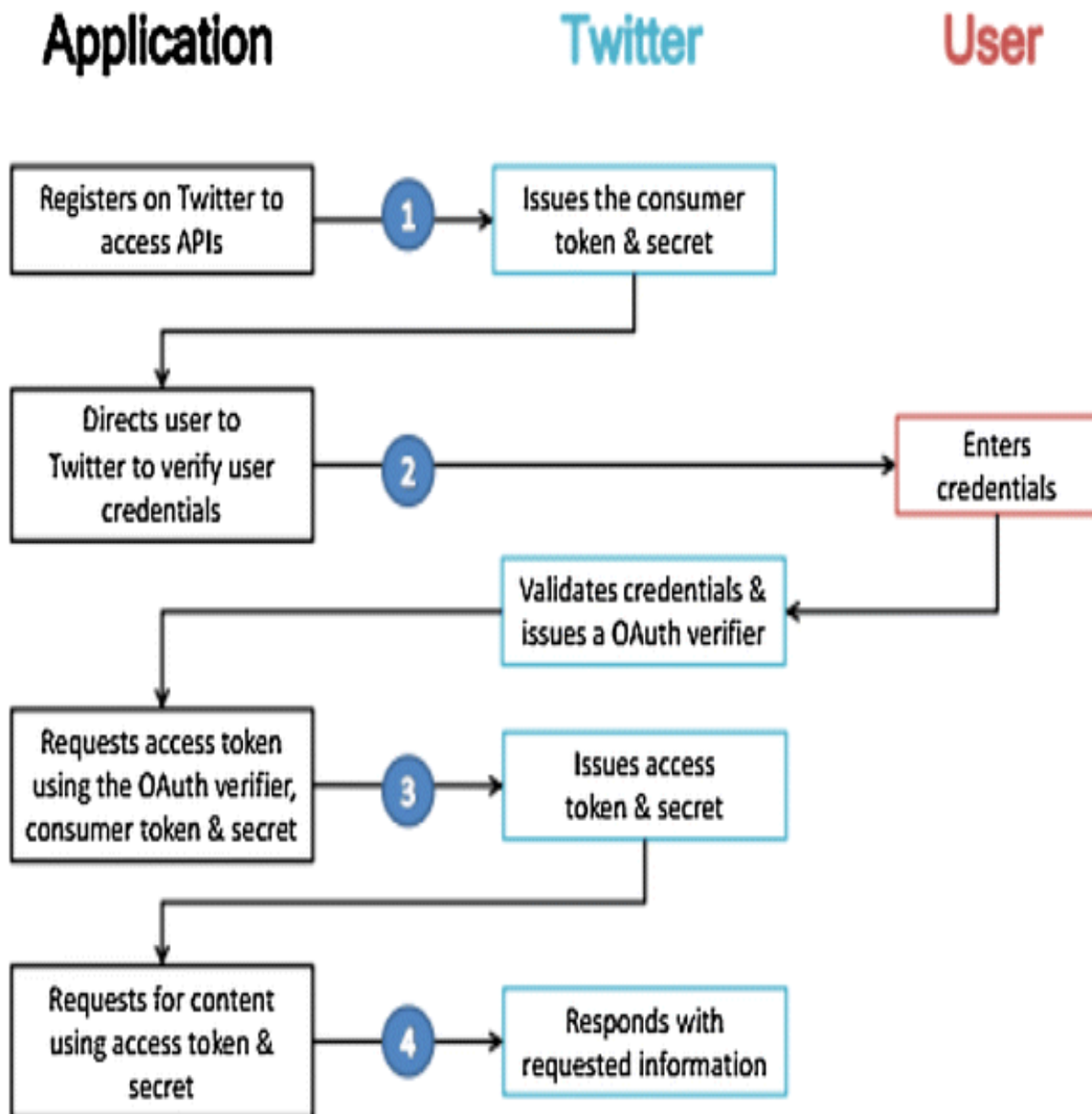


Fig 1.7 the methodology of the proposed system.

## 1.5 ORGANISATION

- In chapter 1, we have discussed about the role of social media in spreading the information fastly during emergency situations, and when any company or organization launches their products, services etc. We have discussed the objectives of this project and the methodology to be used in the process of data extraction and also in the visualization of that data.
  
- In chapter 2, we shared and discussed about the information which we have collected after thoroughly surveying and reading various research papers, websites and journals.
  
- In chapter 3, we have described about the system architecture that is the model of the project. We have also given a description about the various tools needed for our project.
  
- In chapter 4, we have discussed about the algorithms we have used/ are going to use in our project. We analyze the performance. We shows the results here. We shows the graphs, pie chart related to all the positive, negative and neutral reactions.
  
- In chapter 5, we have discussed about the data sets and the test plan for testing our system and what are the different ways of implementing our system.

## CHAPTER 2

### LITERATURE SURVEY

#### 1. Community Detection in Networks with Node Attributes

(Jaewon Yang, Julian McAuley, Jure Leskovec Stanford)

Network identification calculations and techniques are critical devices that permit us to reveal authoritative standards in systems. While identifying networks, there are two significant wellsprings of data one can utilize: the structure of the system, and the traits and one of a kind highlights of hubs.

Despite the fact that, regularly, networks structure around hubs that have basic edges and traits, normally, calculations center around just one of these two informational indexes. Network discovery calculations fundamentally center just around the system structure, though grouping calculations for the most part deal with hub characteristics.

One of the most significant undertakings while contemplating systems is that of distinguishing system networks. Networks permit us to find bunches comprising of collaborating objects (hubs) and the specific relations between them. For instance, in informal organizations, networks that are framed, relate to gatherings of companions who went to a similar school or school, or who have a place with a similar old neighborhood.

Distinguishing the system networks give us the consent to find protests that are practically related, study the different communications between hubs, reach inferences about missing characteristics and their individual qualities and to anticipate certain imperceptibly associations.

Finding system networks can be viewed as an issue of bunching and assembling a lot of hubs into networks, in light of the fact that a hub can have a place with different networks simultaneously. Hubs in networks share regular properties and qualities, and they have numerous connections among themselves.

There are essentially two wellsprings of information that can be utilized to play out the assignment of grouping. The first information is that of the items (hubs) and their individual attributes.

Previously known properties of clients' interpersonal interaction profiles can reveal to us which articles are comparative, and to which networks and modules they have a place with. The subsequent principle wellspring of information originates from the system itself and the arrangement of associations between the different articles.

Notwithstanding, grouping techniques for the most part center just around one of these two informational indexes. As far as certain particular and special traits, grouping calculations distinguish sets of those items whose properties are comparable in nature, while it continues overlooking the connections between objects.

Then again, network identification calculations center around discovering networks that are determined to the system structure, for instance, to find gatherings of those hubs that are thickly associated, however they for the most part disregard the given hub properties.

We can utilize informal community investigation to increase a comprehension of two principle sorts of systems. To begin with, when an internet based life client reacts to a specific sort of data (for example A tweet) a system of such clients is made with hubs (or vertices) speaking to individuals utilizing and reacting to web-based social networking information, and edges (or connections) speaking to reactions to specific information of specific clients.

Since a reaction streams from a responder to a beneficiary, the connections in such sort of system are coordinated connections. Another kind of system that can be built from online information like tweets is an online asset arrange, as habitually information via web-based networking media locales contains connections to website pages because of specific constraints and limitations, in this way forestalling an increasingly itemized depiction of the current circumstance.

## 2.) Social Media Analysis in Crisis Situations: Can Social Media be a Reliable Information Source for Emergency Management Services?

(Mehdi Ben Lazreg, Narayan Ranjan Chakraborty, Stefan Stieglitz, Tobias Potthoff)

Learning and understanding what happened previously, during, and after a crisis is amazingly important for the improvement of the reaction related procedure. Internet based life has become a significant correspondence medium which is utilized by both the influenced individuals and the crisis the executives administrations.

Be that as it may, in various circumstance of emergencies, diverse data can be required, and the data being spread via web-based networking media stages changes in its handiness. It could be profoundly basic and pertinent or absolutely unimportant to the salvage activity process. Giving the most ideal refreshed data is significant to the crisis circumstance the board, and whose activities dependent on that information may spare lives and assets. It likewise determines what diverse web based life stages can give in circumstance of emergency.

Web-based social networking has become a basic mode for data spread during open emergency. It assumes a critical job in many crises today. Three sorts of data sharing via web-based networking media stages during a crisis can be distinguished:

From the crisis the board framework to people in general: they spread situational refreshes, departure systems, every single imaginable danger to the general population.

Second, from open to open: individuals utilize online networking stages to build up contact with family members, loved ones, and to broaden help and backing for the network.

At long last, from people in general to the crisis the executives framework: The open utilizes online networking to send report about issues, prerequisites, trouble calls, and give and scatter data all through the emergency.



The initial two sharing sorts are entrenched on the best way to successfully and productively convey data to the general population during basic circumstances. Different internet based life likewise give strategies to individuals in the influenced zone of the crisis to report their security status.

The third kind is as yet confronting numerous difficulties. Despite the fact that the data shared by people in general can improve the situational mindfulness during a catastrophic event, numerous crisis the executives frameworks are as yet dubious about utilizing such data.

The idea of the messages being posted via web-based networking media during an emergency is of a variable sort. These messages will in general show dissimilarity in their helpfulness as it were. These messages can be totally off-point, individual, instructive or uninformative.

A great part of the exploration via web-based networking media stages like Twitter, show that the messages posted during such occasions can recognize the issues that show up during the aid project and help. Finding and taking a shot at this helpful data can accelerate the debacle reaction. In any case, this errand isn't simple in any way, due to, principally, data over-burdening.

In an examination of the tweets secured during the 2015 Nepal quake, discovered that despite the fact that significant points had been talked about, the data that was a piece of the conversation was frequently insignificant and uninformative.

For instance, money related assistance and subsidizing is one of the profoundly talked about themes, however most of the messages are engaging for gifts from standard and normal people, residing outside the influenced regions and not the genuine monetary necessities which were increasingly pertinent to the crisis the board frameworks.

Besides, the manner in which certain gossipy tidbits and deception are spread quickly via web-based networking media can make it a deceitful and inconsistent wellspring of data. The majority of the internet based life stages.

That play out the undertakings of examination during a basic circumstance, follow an information driven methodology that investigates the information by finding approaches to separate however much data as could be expected identified with the emergency and crisis.

This sort of a methodology may bring about data acquired that isn't helpful to the crisis framework, as inverse to a methodology that investigates the information in strategies that make it valuable to the important inquiries for the crisis framework.

## 2. A Social Network Analysis Of Tweets During The Australian 2010 -2011 Floods

(France Cheong, Christopher Cheong)

By the extraction of tweets from Twitter during the Australian 2010-2011 floods, informal community investigation strategies were utilized to comprehend and examine the online systems that developed during the hour of floods. The goal was to build up a comprehension of the online networks for the Queensland, New South Ribs and Victorian floods so as to distinguish dynamic key players and their adequacy and proficiency levels in spreading basic and helpful data quickly during the crisis.

An optional objective to this examination was to distinguish significant online assets scattered by these online set up networks. Significant and compelling key players during the Queensland floods were seen as:

Neighborhood authorities, political characters, internet based life volunteers, media correspondents and individuals from non-benefit, compassionate and altruistic network affiliations.

A wide scope of important assets were recognized during the Queensland flood. Be that as it may, they were found to be of a more broad data nature as opposed to some remarkable or essential data and updates on the disaster.

In contrast to Queensland, there was no proof of any Twitter action from the side of nearby specialists and the administration in the New South Ribs and Victorian floods. Moreover, the degree of Twitter movement during the NSW floods was just about zero.

The vast majority of the dynamic players during the NSW and Victorian floods were just volunteers. Given the positive outcomes got by the dynamic interest of the nearby specialists and authorities in Queensland, and the expanding appropriation and utilization of Twitter in different pieces of the world for crisis circumstances, it appears to be sensible to advocate for more prominent reception and utilization of Twitter from specialists during circumstances of mass crises.

In the midst of mass disaster circumstances, a marvel called as aggregate conduct becomes noticeable obviously. It incorporates social practices which comprise of exceptionally heightened data search and data assortment and spread.

In such circumstances, individuals need to know the specific areas of their family and not having the option to connect with can be an extremely terrifying situation during these circumstances. Data is basic during debacles as the accessibility of quick and exact data can spare lives and assets.

Individuals offer and spread data about drawing closer and potential dangers of not so distant future, safe spots to empty, where to go for help, and so on. In addition to the fact that they want to find out about the pulverization that has happened, yet they are likewise eager to help and give helps to those influenced by raising assets from gifts and beneficent works.

In this manner, there is a basic need to stay aware of the most recent turns of events, in any case, this can end up being a troublesome and testing task since data created under emergency circumstances is typically dispersed and of differing quality.

Internet based life is an instrument for social communications media. Online networking stages are filled by correspondence innovations, for example, the web, the Web and cell phones and in this manner they transform correspondence into an exceptionally intuitive discourse.

Cooperations by means of internet based life stages are exceptionally appropriated, decentralized and existing continuously world, and they give the necessary broadness and promptness of information required in the midst of calamities. Since online networking gives an extraordinarily quick and ground-breaking strategy to course data, great and awful information spread similarly indistinguishable as mistaken data can likewise spread like fierce blaze. Nonetheless, there are enough demonstrative considers that stand the kindness of social systems which state that data being spread is legitimate and not gossipy tidbits or bogus information.

Twitter and Facebook are genuine instances of online networking that can demonstrate it helpful in emergency circumstances since they give imperative and applicable data as they are going on continuously. Twitter is a small scale blogging application administration, permitting clients to post and trade 140-character-long messages called tweets.

Albeit most tweets are discussion, they are additionally used to share pertinent and indispensable data and report news identified with any mass calamity. Twitter is turning into a significant media in dissecting and overseeing

debacle and crisis circumstances as there is progressively positive proof that it is something other than a long range interpersonal communication site, it has additionally substantiated itself as a news administration.

In crisis situations, tweets give either first-individual perceptions or information or give important information from different outer sources. Data from authentic sources is considered as important and subsequently is effectively looked for after and spread quickly. Different clients at that point comprehend, expound and break down this pool of data to derive different sorts of understandings. Interpersonal organization Investigation (SNA) is a sociological strategy for comprehension and deciphering shifted examples of connections and collaborations between social entertainers to find hidden social structures and relations like-focal hubs that assume the job of center points, pioneers in an online network, profoundly and feebly associated gatherings, and examples of communications among gatherings. SNA has been utilized to contemplate social communication in an enormous accessibility of spaces. Models include: joint effort based systems, organizational behavior understanding and examination between hierarchical connections and information stream, PC intervened interchanges and numerous others.

### 3. The Role of Social Networks in Information Diffusion

(EytanBakshy, ItamarRosenn, Cameron Marlow ,Lada )

Interpersonal organization impact can assume a basic job in a scope of conduct marvel, beginning from the dispersal of data, to the selection and acknowledgment of political sentiments and advances which are progressively engendered through online frameworks.

In spite of the gigantic accessibility of data from online informal organizations, recognizing the fundamental impact stays a test. People will in general engage in comparable exercises as their friends, so it is frequently troublesome, practically difficult to decide from observational information whether a connection and association between two people's practices exists since they have similitudes or in light of the fact that one individual's conduct has impacted and influenced the other.

With regards to data dispersion and spread, two individuals may flow a similar sort of data as one another on the grounds that they have a similar data sources, similar to certain particular sites or TV that they enjoy into consistently.

Also, homophily – the propensity of individuals with comparative qualities and practices to connect themselves with each other – makes issues for estimating the general jobs of solid and frail ties during the time spent data dissemination, since individuals are substantially more like those with whom they interface frequently.

On one hand, sets of people who communicate with one another all the more frequently have more noteworthy chance and opportunity to impact each other and along these lines wind up having increasingly adjusted interests, which builds the odds of virus. Be that as it may, this shared trait expands the potential for jumbles: the individuals who associate all the more regularly are bound to have an undeniably comparable and basic data source. As a result, ends drawn from observational information may overstate the significance of solid ties during the time spent data spread.

Contrariwise, people who interface sporadically have increasingly assorted interpersonal organizations that give access to novel and special data. But since contact between such ties is intermittent, and the people will in general be unlike, a specific snippet of data is less inclined to spread across frail ties. Endeavors to gather data on how regularly combines of individual's converse and where they get their data from have been inclined to inclinations, further convoluting the watched connection between tie quality and dissemination.

Online person to person communication advancements permit people to impart data to a wide scope of people in equal. To quantify the commitment of these media to information transmission, it is essential to consider who influences whom, yet additionally how individuals would at present trade data in the lack of social signals about that data.

People presented to online networking are intriguingly bound to disperse data, ideally than non-uncovered people. It additionally breaks down the overall job of solid and powerless relations in the dispersal of information. While sturdier ties are increasingly noteworthy independently, it is the more broad frail ties that are liable for the spread of new data. This suggests weak ties may assume an increasingly focal job in the scattering of data online than at present accepted.

#### 4. Socializing in emergencies—A review of the use of social media in emergency situations

(Tomer Simona, Avishay Goldberg, Bruria Adini)

Online networking apparatuses are consolidated in many pieces of our day by day lives, as residents, or as crisis responders. Exercises gained from fiascos and crises that emerged universally in have regularly demonstrated that web based life stage apparatuses can fill in as a key and huge constituent of how individuals and specialists react to a circumstance of emergency. Correspondence is one of the most fundamental devices of crisis the executives. It becomes unequivocal when there are many intercessions and associations reacting to a debacle.

Despite the kind of crisis, regardless of whether a psychological oppressor assault, a typhoon or a seismic tremor, correspondence lines might be troubled and cell systems defeat as an excessive number of individuals endeavor to utilize them to get to significant data. Social researchers have offered that post-fiasco dynamic open support was to a great extent charitable, including exercises, for example, search and salvage activities, giving emergency treatment, casualty departure, and online help.

Online networking gives chances to residents in the crisis the board system by both spreading data to general society and recovering data from them. During crisis occasions, people are presented to enormous amounts of data without being aware of their judiciousness or danger of falsehood, however clients are generally prompt to address them, in this way making the web based life "automatic".

Web based life apparatuses, particularly Facebook and Twitter, are taking an extremely basic and huge part in misfortune reaction. Web-based social networking during catastrophes and crises was at first utilized by the overall population to interconnect, and is presently being actualized by crisis responders, governments, and non-legislative associations as a fundamental instrument for debacle the executives forms.

A composed and very much oversight reaction to calamity the board is fundamental to moderating loss of lives and harm to foundation and property. Both hypothetical and down to earth parts of an appropriately oversight and sorted out reaction, including staffing, methodologies, assignments to be practiced, and connections between different reacting and dynamic associations and the social condition itself, is extremely essential.

Data engendering and coordination are a basic factor in misfortune the executives, particularly among responding associations. Responders like to get data yet are apathetic to impart it to other people. Likewise, in any event, when formal data proliferates through the order structure, specially appointed and individual premise channels are made to support staggered data sharing.

A basic piece of fiasco the executives is situational mindfulness, portrayed as structures adding to the appreciation of the crisis circumstance, particularly as for the operational needs of order and control. Situational mindfulness reports can begin from nearby occupants, journalists, specialists on call or from approved and dependable data sources.



During cataclysmic events and crises, circumstance the executives gives access to appropriate and convenient data from both authority and non-official sources, and empowers a sentiment of connectedness. This network to the network gives consolation, backing and help to conceivably bothered people and exploited populaces.

Facebook is the biggest web based life organize, with an estimation of 1.35 billion month to month dynamic clients (Facebook Newsroom, 2014). The gigantic measure of clients of Facebook has the capacity and solidarity to interface and offer data with individuals, join normal intrigue gatherings and networks and express their inclinations. Clients 'like' in posts, pages and gatherings they need to follow and voice their concurrence with, or support, of all the substance distributed.

Twitter is a social medium through which clients can share short messages of up to 140 characters, called as tweets, from web and mobilebased customers. Twitter has around 284million month to month dynamic clients. Clients set up any system by "following" different clients, and having others "follow" them back.

Clients frequently mark their posts with subject names, called as "hash labels", which are utilized as operational intermediaries to distinguish messages, and help different clients comprehend the setting of the message being posted or circled. Data can be redistributed and recycle by clients as re-tweets, which are a show to pass on previously distributed data.

Twitter gives an Application Programming Interface (Programming interface) that can be utilized to do investigates as indicated by specific catchphrases and hash labels, yet it is constrained to recovering just a confined number of elements and information. These watchwords must be extricated from the open's Twitter stream.

The aftereffects of the hunt can be followed back to the specific client and from that point, the whole stream of tweets, answers and re-tweets can be gotten to and investigated. There are numerous devices accessible on the web that assists with empowering perception of information from person to person communication stages.

Interpersonal organizations' data trade underpins the assurance necessity with respect to various types of interchanges that emerge during or after the beginning of a calamity. Persistency alludes to those correspondences which are obvious, recordable, and transferable to others over continuous.

Another preferred position of the internet based life stages contrasted with the customary media is the straightforwardness and simplicity of gathering and scattering data. Use of customary media sources and sites and channels forces a functioning quest for data, while the internet based life gets to the data and newsfeeds at live and genuine occasions.

The entirety of this, combined with a web association that has gotten effectively accessible to all, people are associated consistently and persistently, which enables them to share, arrange and apportion data in regards to different occasions progressively. Web based life gives unrivaled access to data that is distributed online by different clients. During crises, the measure of accessible data in social mediasurpasses the limit of general society to devour it, and in this manner an opposition over the consideration of the individual and people in general is started.

## CHAPTER 3

### SYSTEM DEVELOPMENT

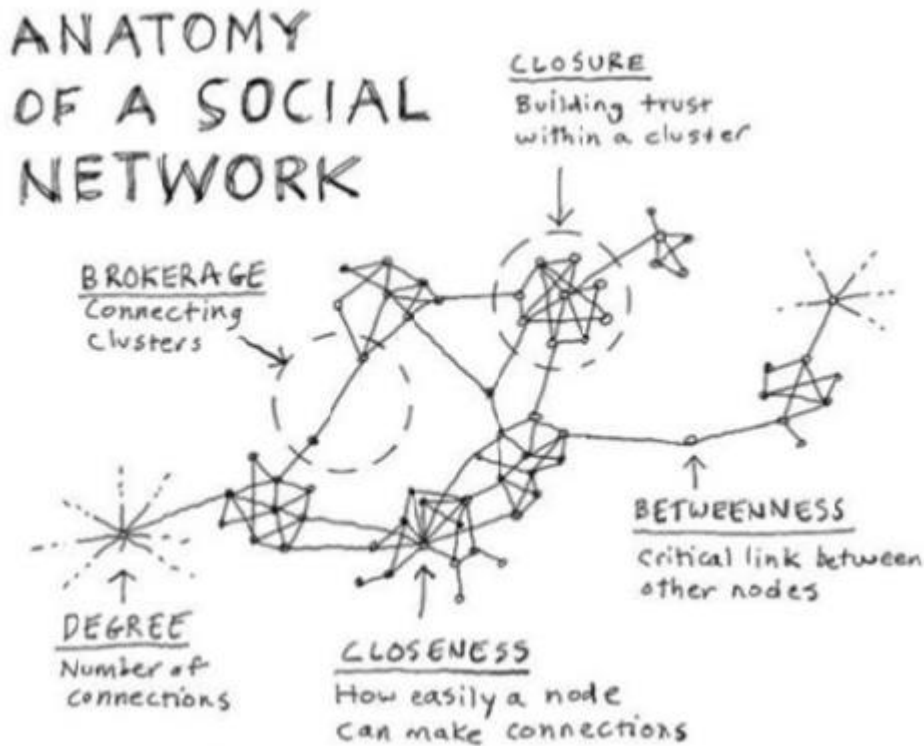


Fig1.8 different attributes in social network

- Important terms and concepts for social media analysis:
- Types of networks on the basis of degree of distribution:

#### 1. Centralized network:

We have a focal proprietor in this system that is a solitary purpose of contact for sharing data. They use customer server engineering where all customer hubs are associated with the server called the focal proprietor. This is one of the most widely recognized and straightforward systems, basically the ace/server reactions or gets customer demands. A various leveled model is Wikipedia.

## 2. Decentralized network:

We have at least two focal proprietors in the decentralized system who share the duplicate of the assets. It evacuates the issue of a solitary disappointment point with a various leveled arrange.

Every hub settles on its own free choice in these systems and subsequently has more self-sufficiency as a system.

There are for all intents and purposes no bottlenecks as the entire burden is disseminated similarly to all hubs with less number of such circumstances go over.

## 3. Distributed network:

The circulated organize is a decentralized system change. It totally maintains a strategic distance from the idea of centralisation. The primary thought for the conveyed organize is to have equivalent access for everybody.

## 4. Random network:

These are charts made by irregular procedures or basically circulation of likelihood. Numerous systems are in no way, shape or form irregular.

In this way these are not perfect systems for thickly populated charts or a certifiable system which ordinarily has correspondence impediments that unmistakably distinguish situations.

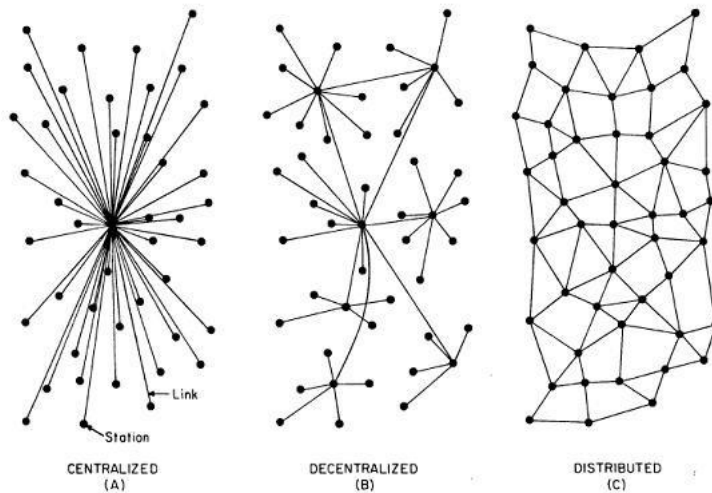


Fig 1.9 It shows centralized, decentralized and distributed network.

## Centrality and Centralization

### 1. Centrality :

These are diagrams made by irregular procedures or just conveyance of likelihood. Numerous systems are in no way, shape or form irregular. Thusly these are not perfect systems for thickly populated charts or a certifiable system which normally has correspondence impediments that obviously recognize situations.

### 2. Centralization :

Centralization is utilized to compute how integral to the various hubs is the most significant hub. This demonstrates how much the hub or gathering of not many hubs rules a chart.

We can examine our system utilizing the accompanying models of estimating the centrality of any system: Centrality Measures for arrange stream: to discover the most significant hub we are utilizing the concept of centrality. The centrality of a hub can be discovered utilizing three different ways which are as per the following:

1. Centrality of degree: it is simply the number or number of social relations / connections a node has, and centrality of degree is simply the degree of a node. It mainly means finding a particular node's "in-degree" and "out-degree."

In-degree is the sum of the node's edges, while out-degree is the sum of the node's edges.

- A. In-degree: it is often understood as a form of popularity,
- B. Out-degree: it is seen as cordiality of an entity on behalf of a node.

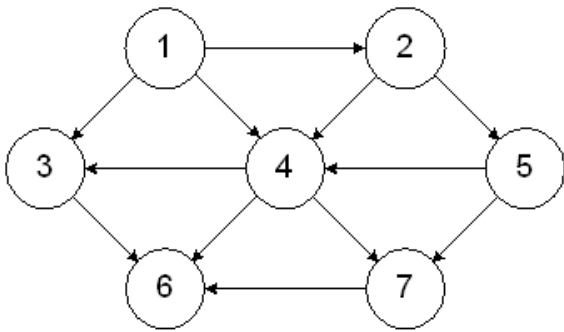


Fig1.10 shows in-degree and out-degree

### 1. Closeness centrality:

This centrality implies how close a hub is to another hub in the system. For the most part characterized organize diagram as the normal of the briefest hub way length. Given that a hub can move messages or influence the associations they right now have.

### 2. Betweenness centrality:

It is the proportion of how much a hub is between different hubs ' way. It is likewise hub measure for the progression of data or news between a lot of hubs while considering that data streams for the most part between the briefest way in a chart.

It is a tally of the occasions that a hub lies between different hubs ' most limited ways.

### 3.Eigenvector Centrality:

Eigenvector centrality is an assessment of a hub's clout in a system. It relegates near scores to all hubs in the system dependent on the observation that associations with high-scoring hubs put more than equivalent associations with low-scoring hubs into the increase of the hub.

### Modularity:

Particularity is one of the key interpersonal organization measurements and basically figures a sub-arrange structure inside a system.

For the most part, a system that has thick/smaller vertical associations in a specific group yet is said to have high seclusion in different bunches.

To produce the densest gatherings, measured quality tests the intensity of a given diagram segment.

### Software Used:

Pycharm is the software we used to run our project. It is used for development using python. Our project is in python language. It also gives graphs , pie charts.



Fig1.11 Showing Pycharm platform



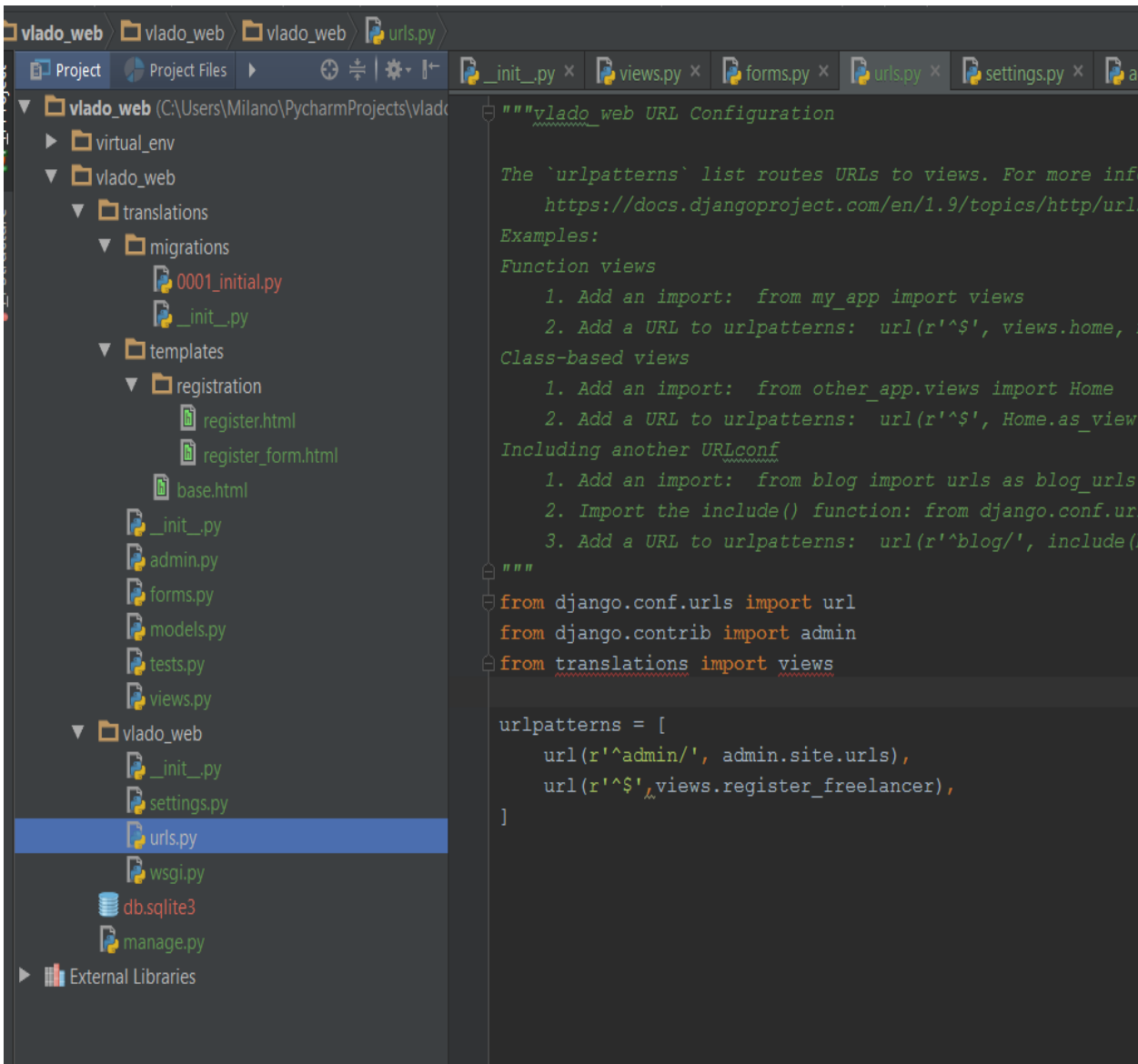


Fig1.12 Showing the workspace of Pycharm

### CLUSTERING ALGORITHM:

The method for social occasion an arrangement of articles so things in a comparable get-together (called a pack) are more similar to one another than objects in various classes (or gatherings). It is a huge data mining development and

a creating technique used in various fields of quantifiable data mining, for instance, simulated intelligence, structure affirmation, picture assessment, etc.and information consultation.

Sorts of Clustering :

Gathering can be fragmented into two sub congregations:

- Hard Clustering: Every info point in hard gathering either has a place with a mass or not.
- Soft Clustering: In gentle alliance, these groups are out a possibility of an information point as opposite to putting every datum point in independent groups.

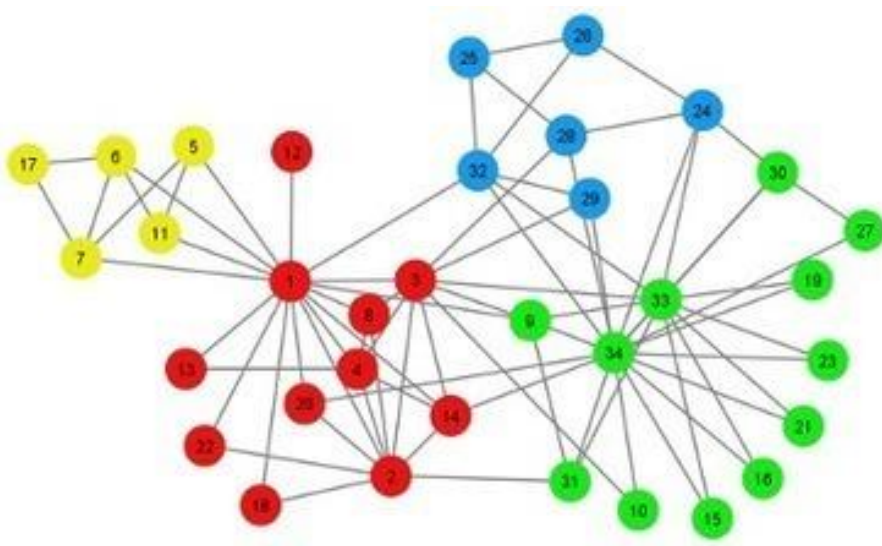


Fig1.13 Cluster formation of network

K-Means clustering:

K-infers gathering is an iterative grouping computation. The purpose of this estimation is to find the cutoff in each accentuation applied and the count works in a couple of stages. This philosophy is an exploratory data assessment method that applies a non-dynamic system for social affair objects using a procedure considered the Euclidean

methodology for partition figuring and further get-togethers the things based least detachment. Euclidean separation is given by,

This method cheers us figure parting between two points  $(p_1, q_1)$  and  $(p_2, q_2)$ .

K-implies gathering pseudo code:

1. Start
2. Enter the amount of groups.
3. Assess the centroid using Euclidean method.
4. Assess the useful separation
5. Group useful information classified on least parting
6. Repeat stage 3 for required emphasess
7. End

Various leveled bunching:

This procedure for packing is used to gather protests that are near in a gathering; it hopes to do so using a dynamic strategy and makes a bundle hierarchy of leadership.

This strategy begins with one gathering, each part in its own bundle along with iteratively joining packs until all things have a spot with one pack. It seeks after a base up approach to manage organize these gatherings and is depicted using dendrograms that layout the different leveled bundling pictorially.

HC can be vocalized to using three linkages:-

1) Single Linkage:

It is the suggestion between the closest hubs of the two bunches.

2) Complete Linkage:

It is evaluated as the separation between the most detached individuals in a group.

3) Average Linkage:

This technique thinks about the detachments between all of the sets and midpoints of the significant number of divisions. This technique is in like manner called unweighted pair bundle mean averaging.

4) Dendrogram :

It is a tree like structure and is used to express to several leveled process.

5) Leaf-person.

6) Root-one bunch.

7) A bunch at 1<sup>st</sup>level ,is the union of its youngster at i+1th level.

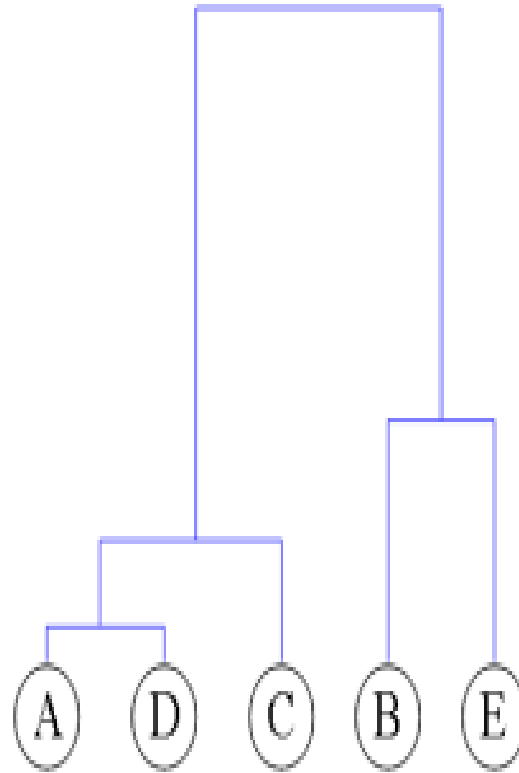
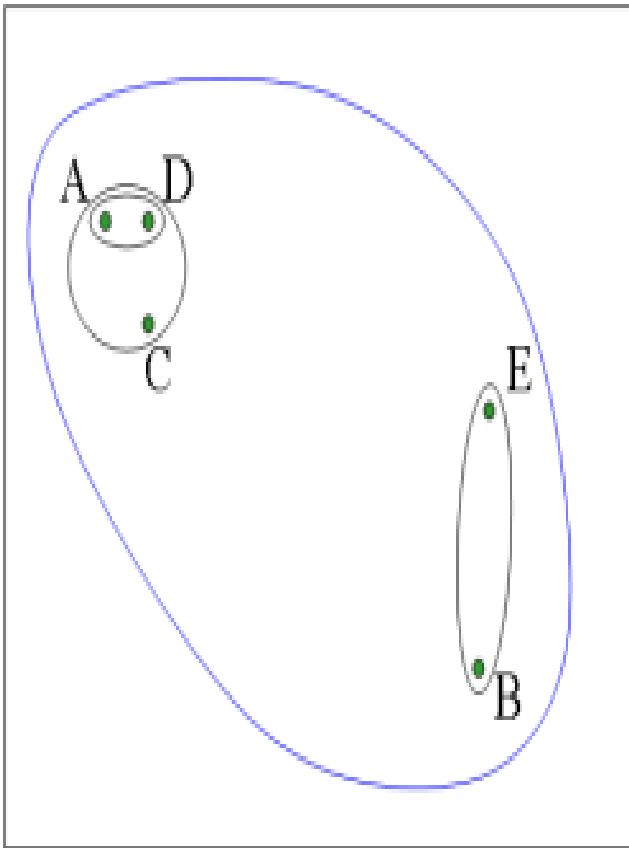


Fig1.14 Shows the dendrogram structure

Code for fetching data from twitter:

```

consumerKey = 'jsTvRoXud8zzEt0tk4Cj41bid'
consumerSecret = '4ks1xVsscS69NE6cpHQcswvRK1TxBoKFhEFD0wmS1hIY1ZQ0wO'
accessToken = '1050376792949841921-aMz0o0meEBbxVy5WkTGhfQy8t11os5'
accessTokenSecret = 'BCBGisj1FgY5YI6zS051bc03xao5WtaZ5qns0xEvveq4E'
auth = tweepy.OAuthHandler(consumerKey, consumerSecret)
auth.set_access_token(accessToken, accessTokenSecret)
api = tweepy.API(auth)

searchTerm = input("Enter Keyword/Tag to search about: ")
NoOfTerms = int(input("Enter how many tweets to search: "))

self.tweets = tweepy.Cursor(api.search, q=searchTerm, lang = "en").items(NoOfTerms)

```

Code for cleaning the tweets by using 'TextBlob':

```

self.tweetText.append(self.cleanTweet(tweet.text).encode('utf-8'))
analysis = TextBlob(tweet.text)

```

What 'TextBlob' can do:

- Tokenize the tweet ,i.e split words from group of content.
- Expel stopwords from the tokens.(stopwords are the regularly utilized words which are superfluous in content investigation as am I, you, are, and so forth.)

- Select just critical highlights/tokens like descriptors, verb modifiers, and so forth.
- Pass the tokens to a sentiment classifier which groups the tweet supposition as positive, negative or nonpartisan by appointing it an extremity between - 1.0 to 1.0 .

Then, we use **sentiment.polarity** scheme of **TextBlob** class to acquire the polarity of tweet between -1 to 1.

Then, we organize polarity as:

```
if analysis.sentiment.polarity > 0:  
    return 'positive'  
elif analysis.sentiment.polarity == 0:  
    return 'neutral'  
else:  
    return 'negative'
```

Fig1.14 Shows the polarity code

\

## CHAPTER 4

### RESULTS AND PERFORMANCE ANALYSIS :

So, we get these particular results and graphs of this project:

Enter Keyword/Tag to search about: *apple*

Enter how many tweets to search: *100*

How people are reacting on apple by analyzing 100 tweets.

General Report:

Weakly Positive

Detailed Report:

10.00% people thought it was positive

17.00% people thought it was weakly positive

3.00% people thought it was strongly positive

3.00% people thought it was negative

9.00% people thought it was weakly negative

3.00% people thought it was strongly negative

54.00% people thought it was neutral

In this we do the sentiment analysis for the keyword apple. It shows percentage of sentiments of people towards the product apple. These sentiments are positive, negative or neutral.



How people are reacting on apple by analyzing 100 Tweets.

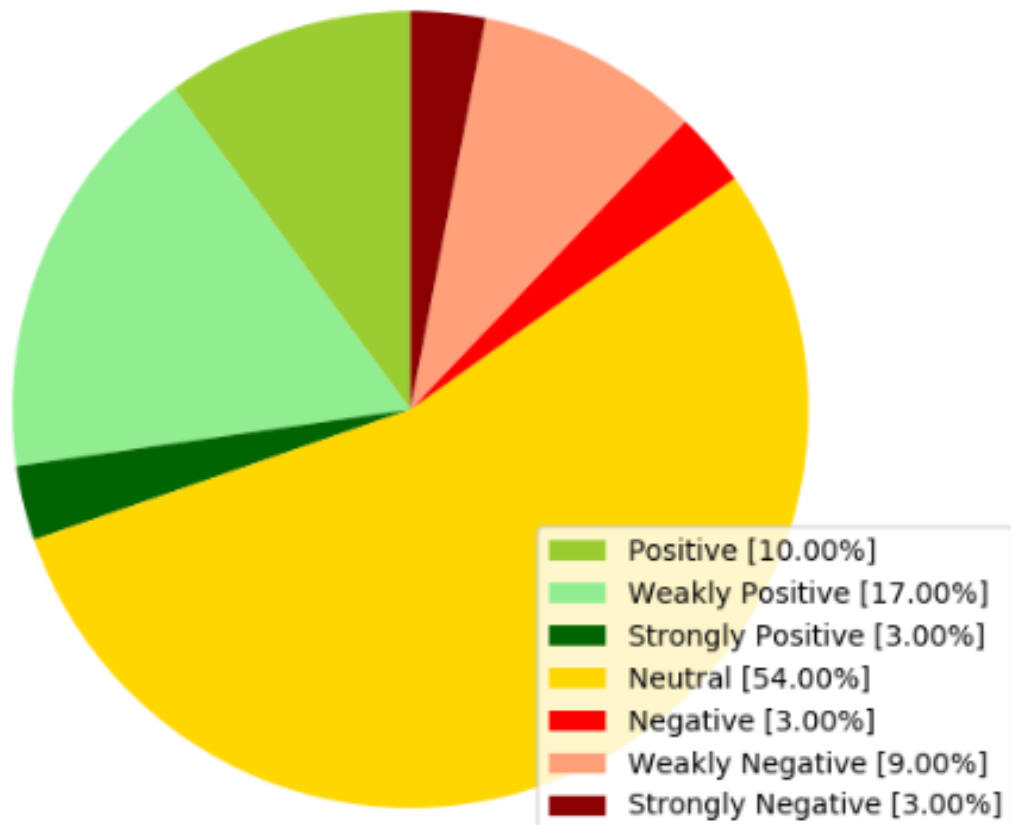


Fig1.15 Shows Pie chart of percentage of sentiments.

- In this we do the sentiment analysis for the keyword oneplus. It shows percentage of sentiments of people towards the product oneplus. These sentiments are positive, negative or neutral.

```
C:\Users\Anshul\PycharmProjects\ans\Scripts\python.exe C:/Users/Anshul
```

```
Enter Keyword/Tag to search about: oneplus
```

```
Enter how many tweets to search: 100
```

```
How people are reacting on oneplus by analyzing 100 tweets.
```

```
General Report:
```

```
Weakly Positive
```

```
Detailed Report:
```

```
15.00% people thought it was positive
```

```
11.00% people thought it was weakly positive
```

```
4.00% people thought it was strongly positive
```

```
1.00% people thought it was negative
```

```
5.00% people thought it was weakly negative
```

```
0.00% people thought it was strongly negative
```

```
64.00% people thought it was neutral
```

How people are reacting on oneplus by analyzing 100 Tweets.

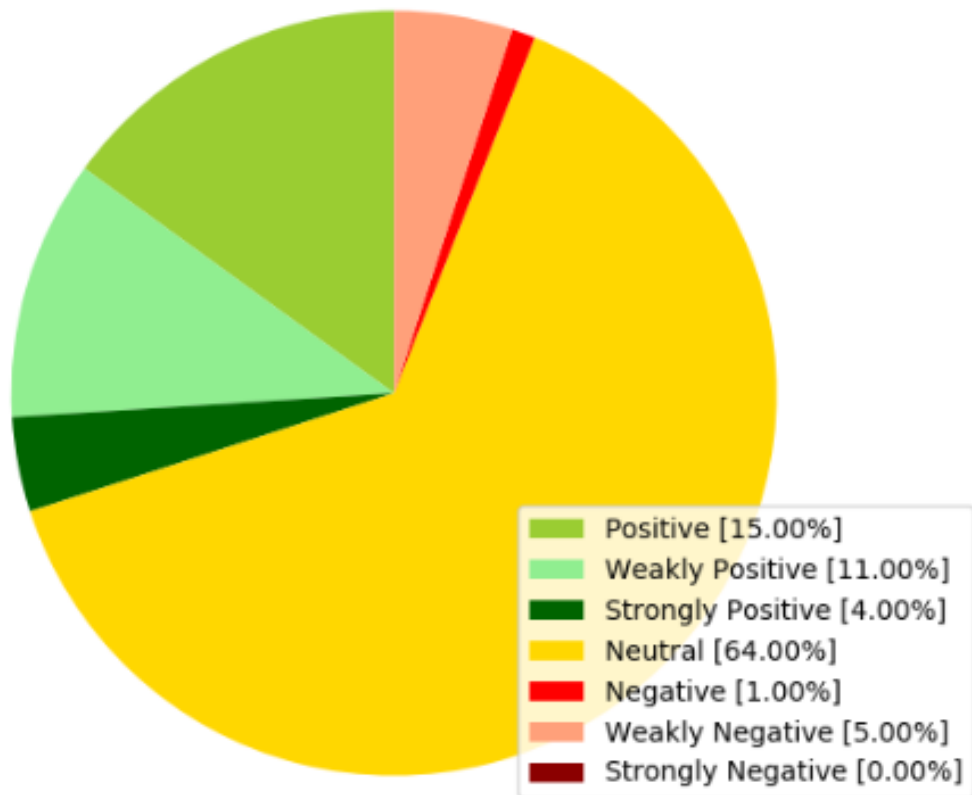


Fig1.16 Shows the pie chart of sentiment percentage towards product

## Chapter 5

### 4.1 CONCLUSION:

In this project work, we wanted to understand the use of social media and its networks in the process of information propagation when any company launches their product, services etc. To see how people react to their products after launching.

We wanted to study the civic grouping structure during such situations, the influential people during such situations and understand the importance of the information being spread during these emergencies.

For this, we first get data from Twitter, a social media platform. The tweets with the respective keywords like “apple”, “oneplus”etc. were extracted from Twitter using Program written in python. With the use of a unique API provided by Twitter, we were able to successfully extract many tweets related to our topic of concern.

Another code is written which gives the pie charts for these particular keywords. These pie charts shows different sentiment percentages towards these products of particular keywords. These sentiments can be positive, negative or neutral.

The main and basic conclusion of our work which we will be targeting in the future is:

- Analyzing the online social behavior of communities after the launch of products.

-Examining the effectiveness of the active key players in shared information.

-Analyzing the spread of the type of information that was of importance.

-Understanding how the information discovered can be of use for sentiment analysis.

#### 4.2 FUTURE SCOPE:

Sentiment analysis is very useful for the businesses. Whenever company and any organization releases their product. People react towards these particular products on social media like facebook, twitter, Instagram etc.

By the use of Sentiment analysis we can find out how many people react positively towards the company's product, how many people react negative and how many react neutral towards their product.

By knowing this they can compare this with oyer company's product. So that they can find out their mistakes and try to improve them. Only then they can achieve something big.

#### 5.3APPLICATIONS:

Business:

Many companies use sentiment analysis to understand how their product impacts the people. By the help of this they can increase their sale in the market. They possibly improve their product by comparing their product with the other company's product.

Politics:

With the help of sentiment analysis we can also predict that the majority of people are of which party's side during the election.

Public Actions

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