

# Social media Competitive Analytics and Sentiment Analytics Using Mobile Brands

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**Abstract**—Social Media is getting importance day by day in the market large amount of data is generated by the users on social media and huge amount of data now freely available there everyone can easily use this data. Social media have been observed by many organizations, an increasing number of corporations are using online social networking tools along with Facebook to give diverse facilities and have interaction with clients. Most of the marketing companies using this data for increasing their competitive advantage, they can extract the data from social media and then analyze and manipulate it using different tools. This paper has some serious efforts for the benefits of the competitor Companies. Effort of this paper is to design a framework which have consisted of some techniques like competitive analysis, sentiment analysis, and statistical analysis and for data extracting and analyzing. This paper consists of data of five different brands of mobile (Samsung, Huawei, Oppo, Nokia and Q mobile) from the Facebook. This paper has included a case study on the basis of designed framework. First of all, collect the data of mobile brands from the Facebook then apply the all techniques of designed framework one by one to find out the similarities and dissimilarities between all five brands and know view of Facebook users towards these brands. This case study will help the companies to know about the customer's feeling and reviews about the service and products of companies. With the use of above mention techniques companies can get advantage from social media content they can make good strategies according to customer's requirements.

**Keywords**— *competitive analysis, Social media, competitive advantage, Sentiment analysis,*

## I. INTRODUCTION

Social media is very common and famous now a days many people using this for different purposes all over the world. They express their views, opinions and feelings about something's. Some of them are customers and they talk about Services of companies and brands and products of these companies and some of them are sellers and owner of these companies. They also express feelings about their

products and services and other competitor's products and services. People can sell and purchase product using social media they can talk with each other about products. Social media help the competitors to know about the customer's choice and shopping behavior from their conversations on the social media. Customer's data is very important for the competitor to improve their marketing and services. According to He, Zha, and Li [1] they said that textual data on the social media show the secrete knowledge which give competitive advantage to the competitors. But it is very difficult to analyze social media data and also very time consuming job [5]. Social media content is increasing very fast it is very difficult to analyze this rapidly growing social media content. It required automatic social media analytics techniques. Decision making and risk management is very important factor in business and to fulfil these factors people use competitive intelligence [2]. For successful business there is a need to oversee the own content on social media as well as competitor's. It is very important for the businessmen to know the opinions and feelings of the customers about their own and competitor's products and services. Different studies show that some businesses that use social media data analytics they leave competitor behind in earnings, growth and performance. The social media content which is generated by the customers becoming the new source of competitive intelligence [3]. It is very important for the competitors after extracting the data from the social media quickly extract the meaningful information that is useful and relevant which clearly show what customers think about their Products and services, using social media data analytics companies can compete more efficiently. Furthermore, Wise competitors apply the learned social media analytics techniques for the development of their products and services[4]. Thus, in order to shine in the business environment companies must use user generated social media content in competitive advantage [6]. This paper includes a designed framework which have consist of some techniques like competitive analysis, sentiment analysis, and statistical analysis. These techniques are used

for analyzing and comparing the data. This paper consists of data collected from the Facebook related to the five mobile brands such as Samsung, Huawei, Oppo, Nokia and Q mobile used most then conduct a case study on this data which is collected from Facebook then apply the all approaches of framework to analyze this data. This paper will help out the different competitors to increase their competency in the market and also, they can design their own social media competitive analysis framework. This paper has shown little bit effort for the companies it expresses how social media help them with the use of social media analytics to enhance their business approach. They can easily know about the views of customers towards their products and brands and services. After analyzing the social media data, they can extract the information about their products and other competitor's products and customers thinking about the products. Companies can easily know what customers actually want from the companies and what they like and dislike when companies have this correct information about their products then they can improve their product qualities which automatically improve their position in the market. Remaining section of this paper is: 2. Includes Literature review A. what is social media B. competitive analytics of social media and sentiment analysis 3. Includes designed framework for social media analytics 4. Includes case study using five mobile brands 5. Includes finding and discussions 6. Includes implications of social media analytics 7. Includes conclusion and future and 8. References

## II. LITERATURE REVIEW

### A. What is social media?

Social media is an online communication platform which consists of websites, web applications and blogs. People using the social media for communications, sharing photo and videos.[7]. Social media is very useful as compare to the traditional media because social media is a two way model and there is two way communication is possible but traditional media only support one way communication to communicate with customers [8]. Some common types of social media websites like Wikipedia, social networking website like Facebook , blogs , content communities like YouTube and micro blogs like twitter [9]. Facebook is most famous and popular among the all social media in the term of traffic and usage it has been used worldwide by the businesses to combine the customer to know the customers feelings beliefs and attitude towards their products and services[10][11]. Social media tools give equal opportunities to every business man they can easily take advantage from these tools. According to Radick [12] social media is very important instrumental to promote the consumer awareness and it provide access to large amount of data that generated from the social media and which is used by the consumer for decision making. Social media is used to reach a large viewers with very low cost [13][14], Social media is working as outstanding buses to access the business market and to communicate with peoples, to

making good relationship with peoples [15], it facilitate companies that have good brands and products [14], Social media is a platform which designed new techniques to quickly broadcast the information [16], Competitors easily can learn about the feeling, perceptions and actions of customer about the product and brand then they can do work to attract the loyal [17].

### B. Competitive Analytics of Social media

It is important for competitors to collect and analyze the content continuously about own and their competitor's content their services, product and plans [1]. Conventionally, competitors extract, information from marketing reports newspapers, websites and. The information extracted from these platforms was limited. Now competitors are using social media for extracting the information and interacting it is very important for the competitors to monitor and analyze the competitor's activities on social media. Big brands are becoming aggressive in the market and they identify the critical situations of their competitors at the starting stage then they set a stable position in market[9]. It is very dangerous for the companies when its competitors use their information from social media and they give products and services according to the customer's opinion and their needs. Simple example of this given by Coombs [18] he said that flow of negative views damage the image of company in the. But according to Dey, Khurdiya, Haque and Shroff [19], they said that social media provide competitor's information but not only has the information also given direct comparison of competitor's product their similarities and dissimilarities in services and customer opinion and feelings about competitor's products and their services. There is need only competitors collect and analyze the social media content continuously then they can achieve advantage from this information. In this way they can overcome their weakness and the enhance their sale value in the market and also this reduce the risk and damage threat and they can easily design latest strategies according to the business requirements [20]. In short, it is essential for business organizations to master the skills of social media analytics so then they can achieve feedback on daily, weekly and monthly bases and then they can generate reports from this and also make news strategies to attract the customers effectively [21][22]. Recent literature on social media analytics express that only few studies just use social media analytics a lot of people have been doing research on these tools to analyze the social media content [19][23]. He, Zha, and Li [1] used social media analytics approach to analyze the unstructured content on the social media like Facebook and twitter they applied this approach on three largest US pizza brands: Domino's Pizza, Pizza Hut and Papa John's Pizza. Results of this approach show the importance of social media analytics and effect of the on the business and marketing value. There are many approaches that are used by peoples to conduct social media analytics for example traditional statistical analysis, sentiment analysis, and content analysis to extract data from social media and

analyze this data and generate useful information from this data after applying these approaches businessman extract the feeling and sentiments of the customers.

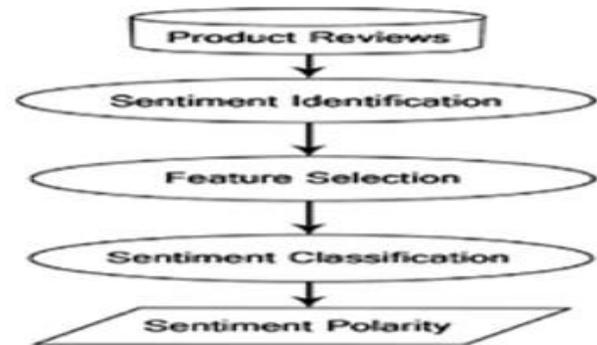
Dictionary based methodologies for sentiment classification are generally unsupervised or pitifully directed. As unsupervised classifiers are generally not ready to recognize which highlights are applicable to extremity classification without commented on information, they regularly resort to sentiment seed words or lexicons as a type of earlier extremity learning for model learning. Such area free sentiment lexicons can be gained consequently or semi naturally with significantly less exertion contrasted with naming an enormous preparing dataset.

### C. Sentiment analysis

Sentiment analysis is the study of opinions, emotions, subjectivities and sentiments, in text [28][29][30]. It is a particular application which is used for special purpose to extract the positive and negative sentiments from the text. [30]. Texts usually contains balanced amount of positive and negative sentiment and to check the polarity sentiment analysis is used in text. Sentiment analysis depend on two machine learning techniques for classification positive sentiment or negative [28][31]. Bollen et al. [32] has applied sentiment analysis on data extracting from the twitter. He has predicted the mood of twitter peoples with 87.6 % accuracy. Duan, Cao, Yu, and Levy [6] applied sentiment analysis to see the review of 70,103 online users about 86 hotels of Washington DC posted on different online platform from 1999 to 2001. Dang-Xuan and Stieglitz [33] have applied tool of sentiment analysis to analyze the two datasets of more than 165000 tweets and they find out how many emotional tweets retweeted more often as compare to other tweets the tool is called SentiStrength [34].

In ongoing writing, much many works has been done on sentiment analysis on data collected from Facebook of client produced content. In contrast to audits, which are generally long and can be utilized to talk about a few parts of a themes, a social substance is framed by a short content; henceforth it is sensible to expect that the essayist examines just a single point. A wide range of techniques have been exhibited to dissect sentence extremity, utilizing both vocabulary based and machine learning approaches. The previous includes the utilization of lexical assets, while the last utilize measurable models prepared on human explained datasets. A broad overview on the current sentiment examination techniques can be found in. In writing there is a discussion about which method ought to be utilized so as to get the better trade off among exactness and generalizability of investigation. Concerning the previous property, the best in class calculations for sentiment examination are really founded on profound neural networks. In the creators present a recursive profound tensor system that can demonstrate the impacts of invalidation yet it is extravagant as far as HR, as it requires preparing information to be physically explained at a few dimensions. An endeavor to take care of the issue of human

explanation is proposed in, where computerized methods for marking the preparation information are exhibited, basing on the emoji's found in the content. This technique demonstrates a decent exactness just when the models are prepared on huge datasets. Broaden this methodology by thinking about 64 emoticons as uproarious marks. They achieve condition-of-the art execution on sentiment, feeling and emotions. An alternate methodology is exhibited in, where the creators propose a system for the programmed structure of clarified corpora through the investigation of outward appearances in YouTube recordings. Since measurable methodologies experience the ill effects of absence of speculation, their presentation decline when moving far from the space on which they were prepared. Thus, they are less reasonable for broadly useful applications, in which we have to break down sentences having a place with heterogeneous spaces, and a few



creators proposed to manufacture area autonomous sentiment classifiers utilizing dictionary-based methodologies.

**Fig.0. Sentiment Analysis Process**

Figure 0 shows the Sentiment analysis process step by step. For sentiment investigation a lexicon-based classifier is proposed in, where that processes sentiment extremity considering nullifications, intensifiers. A breaking point of this work is that words are expected to have only a solitary extremity that should be free from setting. We vary from this work in that we likewise think about polysemous words and subsequently we present a setting-based word sense disambiguation calculation. In any case, our methodology contrasts from in the manner the sparkles are utilized. Customary directed techniques depend on the sack of words approach that is a vector portrayal of words' recurrence in the sentence that does not consider the specific situation. These techniques generally have under 60%. On the last mentioned, a review of the principle and techniques found. In the creators propose to adversely name each word until the following accentuation mark. In any case, this straightforward methodology isn't reasonable for complex type of sentences, since it doesn't consider the nearness of various provisions communicating various conclusions. Broaden the past work by considering a fixed window for

invalidation. The methodology appears to have a decent exactness, however it can't be contrasted with, as it additionally thinks about other extremity shifters, for example, intensifiers and diminishes. By these methodologies have a few restrictions, since they are not ready to distinguish the correct extent of refutation. A first endeavor to show the impacts of nullification considering linguistic conditions [18], yet the creators don't give data about how the parser is utilized, neither play out a test assessment. Decide the extent of refutation by thinking about static and dynamic provision heuristic and delimiters standards, while depend on the joined utilization of learning bases and semantic parsing. These two methodologies contrast from our own in that we don't utilize information.

Facebook posts from six diabetes related social occasions were evacuated. These get-togethers have been developed since 2014 and have a working incorporation from customers with an ordinary of 42 posts for consistently. Beside posts and comments, the amount of inclinations, comments and offers were in like manner isolated [20]. This in like manner consolidated the amount of reactions expelled freely for each reaction which are hahaha, angry, love, sad and wow.

### III. A FRAMEWORK FOR COMPETITIVE ANALYTICS

Figure 1 shows the complete framework which consists of some approaches such as statistical analysis, content analysis, social networks and sentiment analysis these approaches are used to conducting the research on social media competitive. Our designed framework consists of some important methodologies which have been take from various fields such as computer science, mathematics, statistics, linguistics and social sciences. For implementing these approaches there is a need of some algorithms for example text classifications, topic modeling, sentiment analysis and n-grams [25][35]. There are many methods to extract data from social media such as Facebook, Twitter and YouTube. Simplest method of extracting data from social media. we used Net viz software for extracting the data. Currently, most of the social media sites providing the application programing interface (API's) for data extraction. With the use of these API's organizations can easily develop custom application to extract the data as compare to others social media like blogs do not provide API's to extract the data but they provide RSS feeds to extract the data. Some of them are not providing RSS but they provide facility of HTML parsing which is used to collect the data but it is very time-consuming way of data extraction.

The data collected from social media will be saved in repository at the back end and then this data used for analysis. Companies can remove data form front end of the website but at the back end this repository still exist for future use. Our framework can help the competitors to construct the repository of social media content and also managing the heterogeneous social media content. On the bases of our designed framework monitoring of social media and social media analytics can be further developed competitors can save their data from other competitors they can easily extract, store and analyze this content [36]. Reports of each competitors can be generated on the basis of social media which service they are providing to the customers and what is their marketing value and what is the thoughts of customers about their brands and products for example, a company can make its marketing planning and strategies more effective, responsive, useful and according to the customer’s need by analyzing the sentiments and comments about particular brand and product of customers. With the understanding of pattern and trends social media and issues and problems as well the companies can make good decision for their business and they can achieve better quality and good customer experience and better outcome in

future from their improved service [3].

#### IV. A CASE STUDY

##### A. Research Questions

Case study conducting in this paper consists of data collected from Facebook in the form of total posts, comments, likes and shares related to five most popular brands of mobile used such as Samsung, Huawei, Oppo, Nokia and Q mobile. This study answers the given to questions:

- Most Popular mobile brand?
- What are the results of sentiment analysis in the form of Negative and Positive comments on social media?
- What are the differences in their FB posts?
- How they interact with their customers?

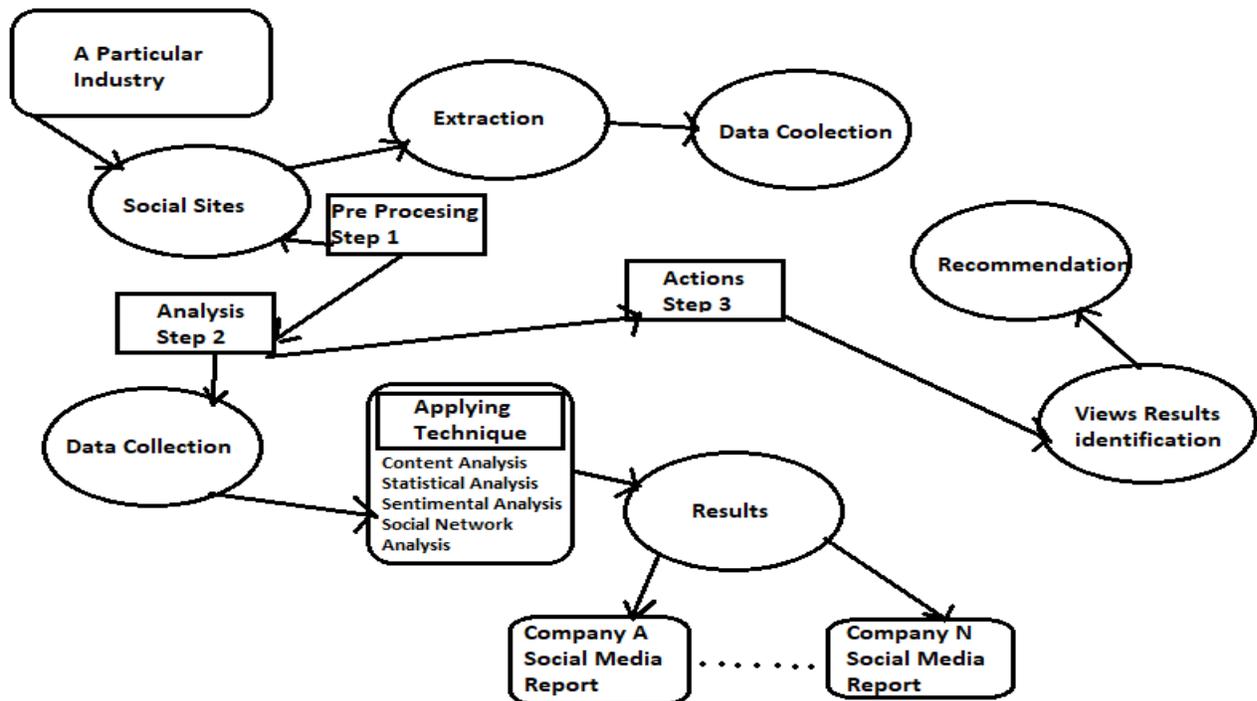


Fig. 1. Designed framework which is used for social media analytics

*B. Methodology used in case study*

Mobile brands are competing each other these brands connect their customers on social media. Many mobile brands are used in but this case study just include five most popular such as Samsung, Huawei, Oppo, Nokia and Q mobile. All brands sale their products with the help of social media. Currently, there are approximately 100 mobile companies in the world but almost 10 companies are most famous. All the mobile brands doing marketing on social media like Facebook, twitter and YouTube they can engaged vast amount of users of social media for marketing all social media are now used in some context but Facebook is most popular and it is mostly preferred by the users that’s why I have collected data from Facebook. In this case study I have taken the data of five most popular brands of mobile that are used most. I have applied social media analytics on this data and my main focus is on which is most famous and popular mobile brand? What are the results of sentiment analysis in the form of Negative and Positive comments on social media? What are the differences in their FB posts? How they interact with their customers? There is large amount of user on social media but very small research done on these brands that’s why I have collected data then I have applied, statistical analysis, sentiment analysis and competitive analysis these social media analytics on data that is collected from social media.

**V. PROCEDURES**

This paper used the designed framework to answer the research questions which is shown in Figure 1, this framework is used for competitive analysis. This paper consists of data collected from Facebook through Netviz related to mobile brands and saved in excel in the form of how many post brands made in a day and how many people do likes, comments (positive and negative) and shares. This

case study only conducting on the data collected. After extracting the data from Facebook apply the all techniques of designed framework. Firstly, apply the statistical techniques for generating graphs of all brands with the information posts, likes, comments, positive and negative comments and shares. Statistical analysis include analysis such as descriptive.

In this Paper Sentiment analysis techniques is applied on data extracted from Facebook to find out some patterns and categories and problems, and issues. Most of the researcher Net viz API to extract the textual data i.e. the comments of the users etc.

Sentiment analysis is mostly used to monitor the reputation of the brands in the market and it help the brands to know about customer’s views towards their products and services. I have used SentiStrength for sentiment analysis. It is used to find out the positive and negative sentiments of the customers on social media [33].

**VI. FINDINGS**

Data collect from the Facebook in the form of posts, likes, comments, positive and negative and shares. Table 1 and F in this paper clearly show the total posts, likes, Shares and positive and negative comments. This table show that Samsung mobile brand is most famous and popular brand large number of peoples interacting with this brand. Findings on the basis of statistical analysis have shown in Figures 2, 3, 4, 5 and 6 which shows the level of customer engagement with to the mobile brands such as Samsung, Huawei, Oppo, Nokia and Q mobile on Facebook how many people likes, comments and share their posts. As Dey, Haque, Khurdiya, and Shroff [39] show that social media data is a key for brands success in the market now a days.

**Table. 1. Show the data related all five brands**

| <b>Brands</b>   | <b>Posts</b> | <b>Likes</b> | <b>Comments</b> | <b>Reactions</b> | <b>Shares</b> |
|-----------------|--------------|--------------|-----------------|------------------|---------------|
| <b>Huawei</b>   | 590          | 1428071      | 174752          | 1523944          | 126736        |
| <b>Oppo</b>     | 539          | 3438547      | 147468          | 3590926          | 120774        |
| <b>Samsung</b>  | 617          | 1970470      | 2071528         | 55890            | 97386         |
| <b>Nokia</b>    | 199          | 153576       | 13584           | 163602           | 9869          |
| <b>Q Mobile</b> | 39           | 65663        | 6637            | 71690            | 2089          |

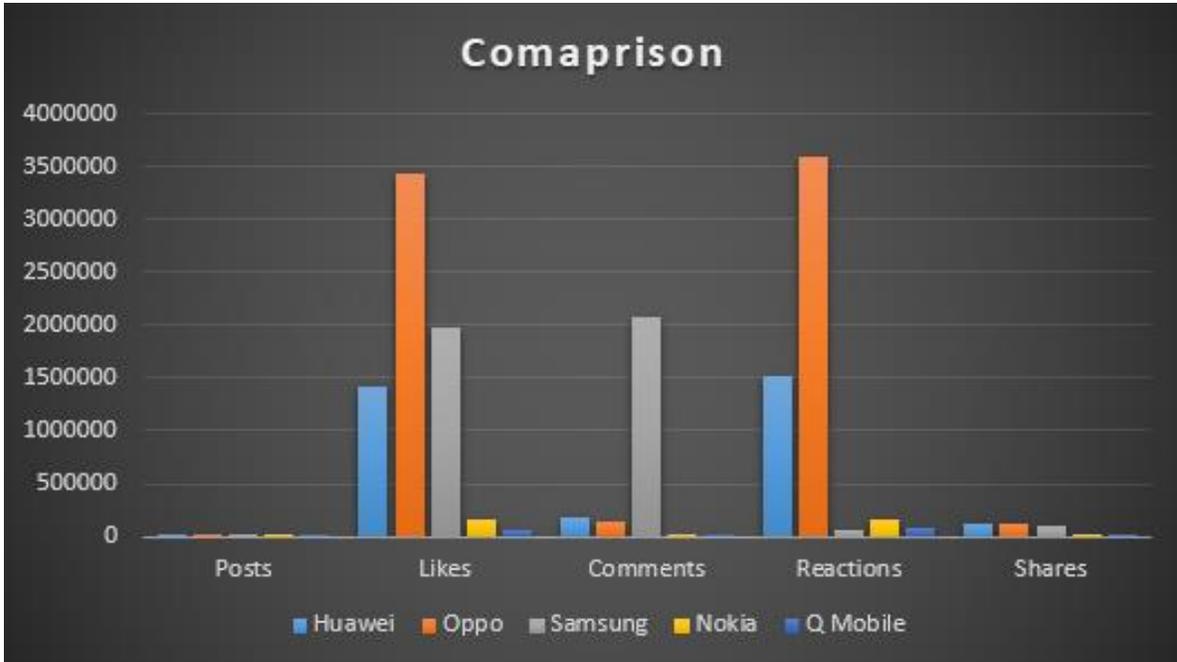


Fig.2. Comparison of Posts, Likes, Reaction, Comments and Shares btw the mobile brands.

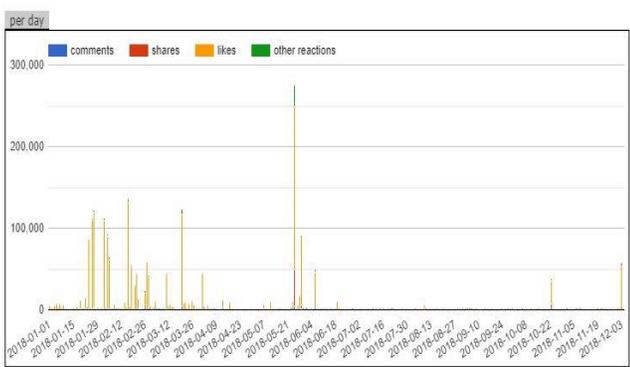


Fig.3. Samsung mobile customer engagement trend per day

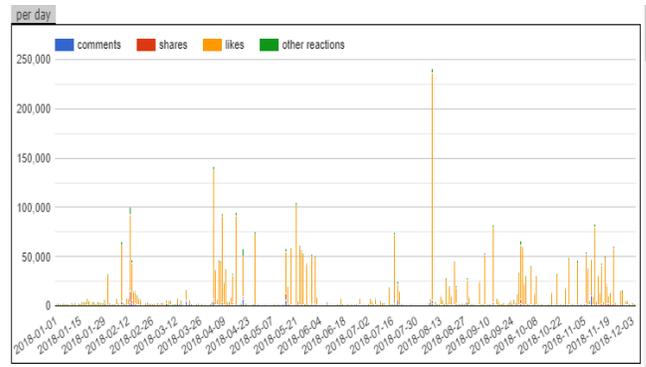


Fig.5. Oppo mobile customer engagement trend per day

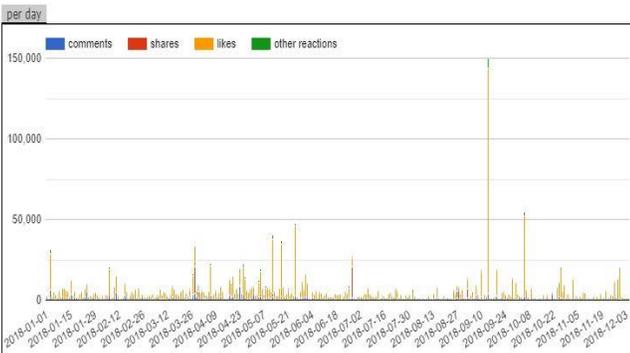


Fig.4. Huawei mobile customer engagement trend per day

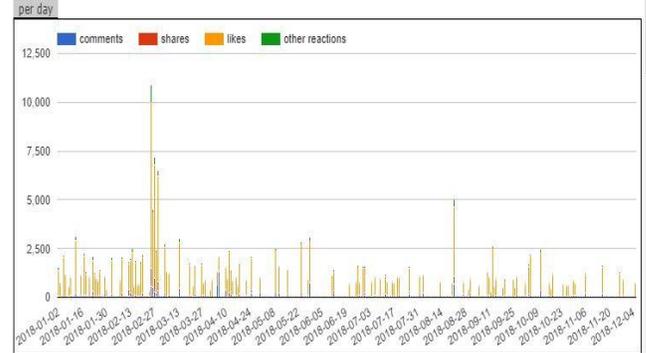


Fig.6. Nokia mobile customer engagement trend per day

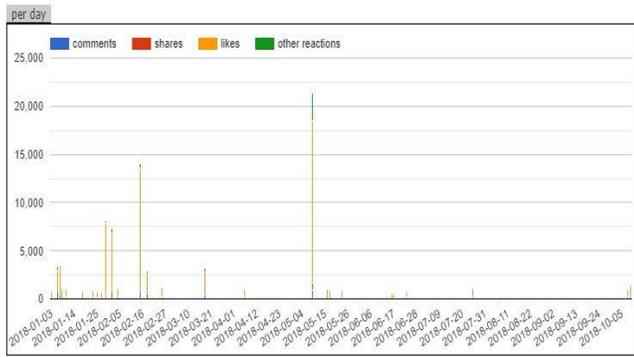


Fig.7. Q mobile customer engagement trend per day

We apply sentiment Analysis On this data which is shown in table 2,3,4,5 and 6 also in Figure 8, 9, 10, 11 and 12. This tables Figure 7 showing the positive and negative sentiments of the peoples related to the all five brands. Sentiment analysis of all five brands clearly show that the most of the peoples using Samsung mobile Brand. Sentiments analyses of this case study depend on the content collected from Facebook from Jan 1 to DEC 31, 2018. Most of the people showing interest for the Samsung mobile brand but other brands also used widely but Samsung mobile competing the whole market. Samsung mobile’s brand giving more offers and new features to the customers. And this brand advertising on Facebook more than other brands this is a key point of success of Samsung mobile brand

Table .4. Sentiment Analysis of Samsung mobile related comments

| Sentiment | Occurrence | Percentage (All) |
|-----------|------------|------------------|
| Positive  | 23099      | 55.63 %          |
| Negative  | 18418      | 44.36 %          |
| Total     | 41517      | 100 %            |

Table.5. Sentiment Analysis of Nokia mobile related comments

| Sentiment | Occurrence | Percentage (All) |
|-----------|------------|------------------|
| Positive  | 9932       | 52.54 %          |
| Negative  | 8970       | 47.45 %          |
| Total     | 18902      | 100 %            |

Table. 6. Sentiment Analysis of Q mobile related comments

| Sentiment | Occurrence | Percentage (All) |
|-----------|------------|------------------|
| Positive  | 3470       | 56.47 %          |
| Negative  | 2674       | 43.52 %          |
| Total     | 6144       | 100 %            |

Table .2. Sentiment Analysis of Oppo mobile related comments

| Sentiment | Occurrence | Percentage (All) |
|-----------|------------|------------------|
| Positive  | 62956      | 58.18 %          |
| Negative  | 45249      | 41.81 %          |
| Total     | 108205     | 100 %            |

Table.3. Sentiment Analysis of Huawei mobile related comments

| Sentiment | Occurrence | Percentage (All) |
|-----------|------------|------------------|
| Positive  | 73647      | 57.84 %          |
| Negative  | 53666      | 42.15 %          |
| Total     | 127313     | 100 %            |

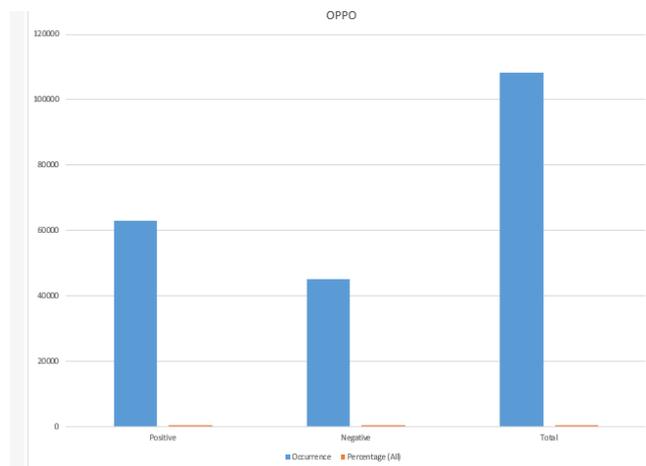
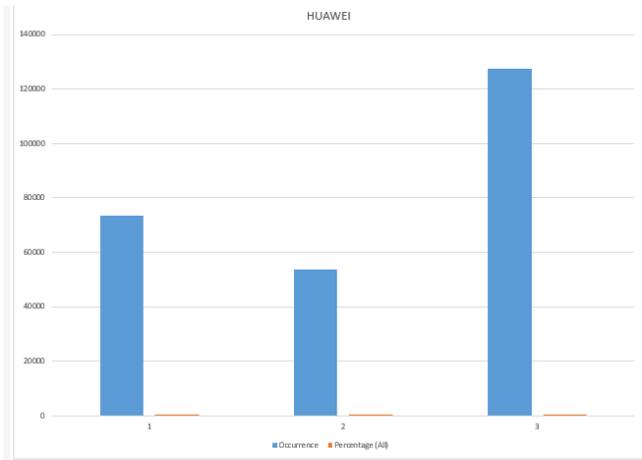
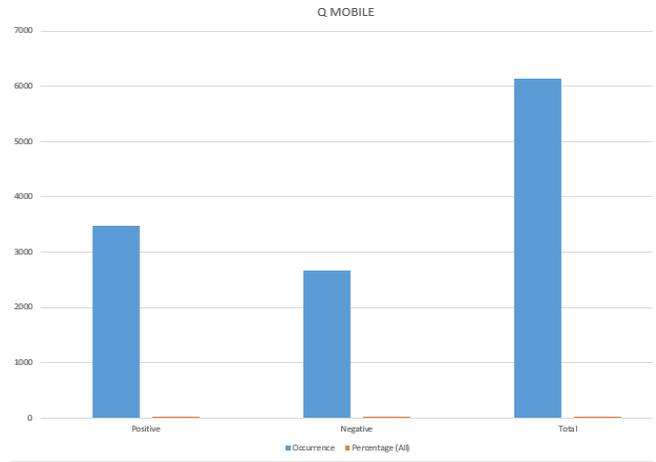


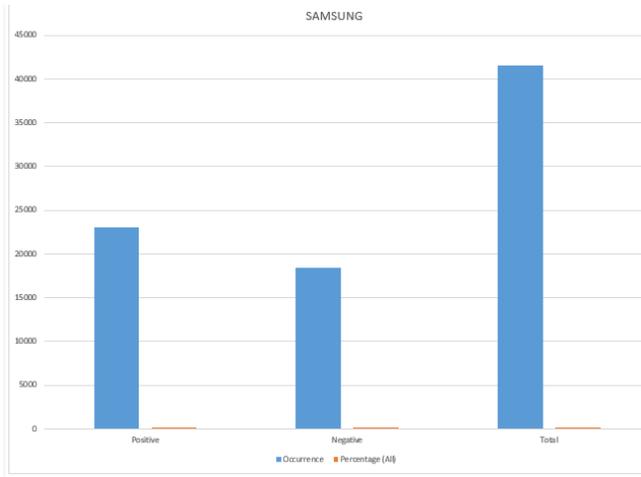
Fig.8. Sentimental Analysis of Oppo



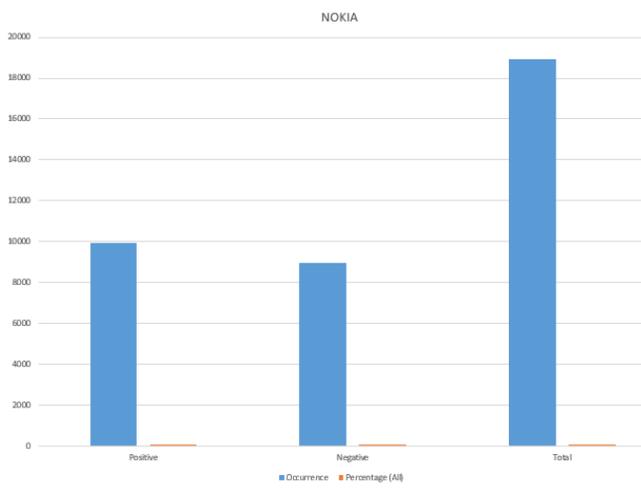
**Fig.9. Sentimental Analysis of Huawei**



**Fig.12. Sentimental Analysis of Q Mobile**



**Fig.10. Sentimental Analysis of Samsung**



**Fig.11. Sentimental Analysis of Nokia**

## VII. IMPLICATIONS AND DISCUSSIONS

Social media is a very famous source of generating vast amount of data. Many peoples come on social media for time passing for chatting with friend and family but on the other hand most of the business man come on the social media they talk with their clients about their products and their service this confidential data also is saved on the social media. This data is very useful for other business men they can easily get information about the products that are mostly used by the customers. When this confidential information reach to the other business men they can make new strategies for their business according to the customers need. Data extraction from the social media is very difficult task for the business men and also extracting relevant and useful information from this raw data which is collected from the Facebook is most difficult task and also time consuming. But once this data is collected from social media and also useful information is extracted from this data the business men can use this information for the betterment of their businesses they can easily improve their products and services quality for customers according to their need. Business men now knows this secrete but they have no idea how to do that. This is the reason of conducting this case study which clearly show that with the use of social media analytics every business man can take advantage from social media content. Social media is a key for all business mans they can extract the data from the social media and then they can apply the social media analytics techniques to analyze and the find out the useful information then they can make proper strategies according to the customer’s requirement like my case study I have taken data from Facebook of five mobile brands and I have shown how to analyze this data and then how to apply social media analytics successful business man can take advantage from these approaches they can make advance planning for their business from reviewing the comments and feelings of users towards their service and products and it will help them in future.

## VIII. CONCLUSION AND FUTURE WORK

This case study finds out the way how brand and competitors can take advantages from social media. Social media is a good source of information it hid very useful information in it. This paper's case study clearly shows that with the use of social media analytics every brand can take advantage from social media content. Social media is a key for all business mans they can extract the data from the social media and then they can apply the social media analytics techniques to analyze and the find out the useful information then they can make proper strategies according to the customer's requirement like this case study which is conducted in this paper have taken data from Facebook of five mobile brands and shows how to analyze this data and then how to apply social media analytics on it. The successful business man can take advantage from these approaches they can make advance planning for their business from reviewing the comments and feelings of users towards their service and products and it will help them in future. In Future work this paper will include new data extraction tools and API's and also large data set for, statistical and sentiments analysis. We will apply text mining techniques on this data set.

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