

Analysis of Communication on Social Media

N. Narwal

Maharaja Surajmal Institute, New Delhi, India

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Abstract— Social media has found its place among all age groups. Nowadays, people find it easier to communicate using Social Media tool rather than talking directly to the other person. The time spent by individuals on social media is also a matter of concern. In our study we analyzed two major factors related to social media, one is the time spent by individual on social media and other one is sentiment analysis of communication. The study is conducted over two age groups over a period of one and half years. The result that youngsters are more involved in social media communication and the sentiment of communication is prominently negative.

Keywords—Sentiment analysis, whatsapp, behaviour pattern, social media, web 2.0

I. INTRODUCTION

According to the Oxford dictionary, the definition for sentiment analysis is the process of automatic identification and categorization of opinions expressed in user message. Sentiment analysis can be made on any text shared by individuals on discussions forums, twitter, whatsapp etc. and other social media platforms. With the proliferation of social media in our lives, soon there will be time when people find comfortable to communicate using social media rather than direct communication.

We need to divert our attention on the outcome of excess involvement of individuals on social media on persons personal growth and development.

According to Statistica.com the social network penetration in India in Jan 2017 is 14% of population. The statistics also states that the most popular social networking sites during 2017 is YouTube and Facebook with 30% penetration each and WhatsApp is ranked third with 28 % reach as shown in Figure 1. India is ranked second with 11 percent share of global facebook audience among all participating countries.

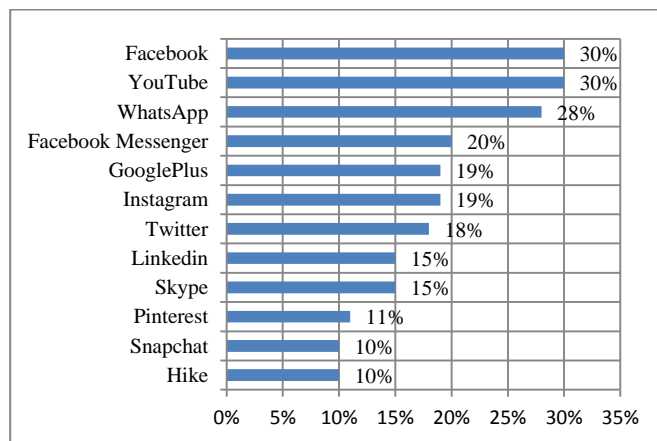


Fig 1: Graph showing penetration of leading social networks in India as of 3rd quarter 2017

Social media is used by people of all ages and has become indispensable need for today's youth. According to another statistical survey conducted by Statistica.com the number of active WhatsApp users in India as of February 2017 is 200 million making 16.32% of total India population according to Statistica.com.

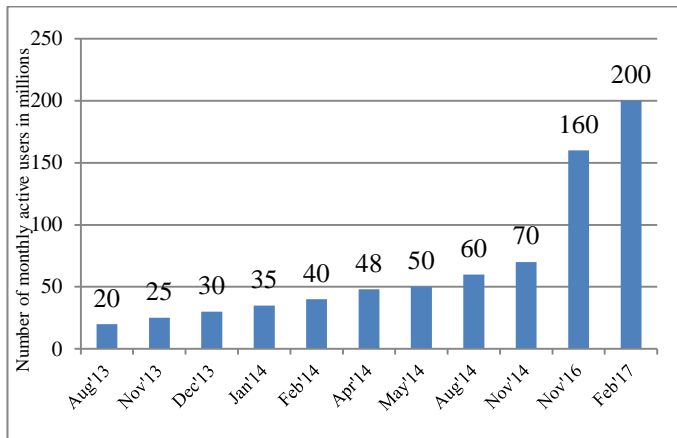


Fig 2: Number of active WhatsApp users in India from Aug 2013 to Feb 2017.

The graph shown in Figure 2 displays multiple fold rises in Social media users in India. The major segment of social media active user being the youth it is more challenging to check the information being shared amongst them.

In our study we studied two WhatsApp Group Chat collected over a period of one and half year from June 2016 to Jan 2018. We designed module in R language to find Sentiment analysis of the Group Chat, where one Group-A comprises of members of the age group 18 to 23 years and another Group-B having members of the age group 30 to 45 years. The analysis showed that number of Chats in Group-A is approximately 60% more than Group-B. After observing the sentiments of both Groups it was found that Group-A showed varied sentiments in their chats demonstrating more of negative sentiments in their discussions. However, chat of Group B demonstrated maximum positive sentiments.

The results obtained is disturbing and needs attention, as youth of our Country is falling for Social media and sharing thoughts with negative, sad, disgust, fear etc. which is a matter of concern.

This paper is organized as follows, Section II presents the current research work done in this area, Section III proposes the methodology adopted in this study, Section IV presents the results and discussion. Section V concludes the research work.

II. RELATED WORK

Emma Haddi et. al. [1] in their research work performed sentiment analysis by focusing on some words and their frequency in the document. The terms that appear often in the whole document but seldom in a collection are more informative stating the meaning of the document in comparison to terms that just appeared once. Also, the

position of words in a document can completely change the meaning of a sentence.

Sakthivel et. al. [2] in their research work prepared a set of questions and half-structured interviews that were performed on the students and the teachers. Open questions helped the students and teachers to tell their stories in a flowing manner and there were some other findings that wouldn't have been discovered with closed end questions.

Bouhnik et. al. [3] for their research work primary collection of data was done at places in the University where high number of students were around liking dining area, sports arena, libraries. Students were asked to complete a questionnaire. This research helped to find out the primary feature of WhatsApp that was used by students and how effective is WhatsApp to their studies and social life.

Tshwane [4] in their research work focused on how the social media has affected the daily life of students. A set of questions were asked and interviews were conducted to collect the data which was required for analyzing the effect on the social and academic performance of students. Some questions were semi-opened-questions and these questions had no restrictions how they should be answered providing the participants with opportunity to write what they couldn't have written in closed-end-questions.

Yeboah et. al. [5] their research is based on scientific citations. The information that has been collected for this research is from some other research papers that are related to the field and study. Data is also extracted from databases so that any key article is not missed.

Khatib et. al. [6] in their research paper gave the basic idea of a natural language based Android App Polarity analysis system for reviews which is capable of evaluating the reviews and provides result in appropriate form. First, the reviews are collected from google play store and then their polarity is identified as positive or negative by comparing them with the already present datasets. And, the total result is judged afterwards.

Dabhade S. S. et. al. [7] in their research paper illustrated the research area of Sentiment Analysis on movie reviews or product reviews like android apps. Data is collected from various sources – review sites, blogs, forums or social networks. This data is analyzed using natural language processing system or machine learning approach after the data is filtered through a parser or spell checker.

Patni et. al.[8] presented an interactive visualization system, SentiView, which analyzes public sentiments from text

posted via media such as forums and predicts the short-term trend of the sentiments about events being discussed. Public opinions are studied and represented in relationship map consisting of comment points, relationship lines and interactions and then categorized into opposing, neutral or supporting sections.

III. METHODOLOGY

In our study we studied the chatting pattern of two age groups viz., Student Group referred Group-A where students in the age group 18 to 23 years and Group-B where adults in the age group 30 to 45 years.

The group chats of approximately one and half year was collected from WhatsApp Chat Tool and analyzed. In order to study the sentiment analysis of Group Chat, we designed a module is developed in R language which cleans the chat and provides sentiment analysis of the group Chat.

The pseudo code of the R program to create sentiment analysis graph is as follows.

Step 1: Include R program libraries.

Step 2: Import the text file in R.

```
Corpus(VectorSource(filename))
```

Step 3: Clean the data from stop words, punctuation and convert it in lowercase.

```
tm_map(wordCorpus, removeWords, stopwords("english"))
```

```
tm_map(wordCorpus, removePunctuation)
```

```
tm_map(wordCorpus, content_transformer(tolower))
```

```
str_replace_all(string, pattern, replacement)
```

Step 4: Calculate sentiment of each chat amongst eight sentiments: anger, anticipation, disgust, fear, joy, negative, positive, sadness, surprise, trust.

```
get_nrc_sentiment(whatsapp_chat)
```

Step 5: Compute aggregate summation of all eight sentiments.

```
data.frame(colSums(chat[,c(3:12)]))
```

Step 6: Plot the graph of sentiment analysis

```
ggplot(data = sentimentTotals, aes(x = sentiment, y = count))
```

IV. RESULTS AND DISCUSSION

The results of the Sentiment Analysis of the two WhatsApp group chat data of two different age groups over a period of one and half year from June 2016 to Jan 2018. The analysis showed that number of Chats in Group-A is approximately 60% more than Group-B. There were 2100 chats in Group-A and 1080 chats in Group-B. The frequency chart of WhatsApp Group Chat is shown in Figure 3.

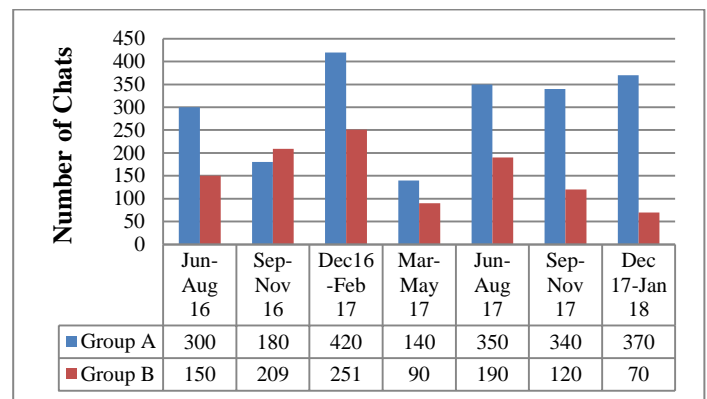


Fig 3: Frequency chart of WhatsApp Group Chat

The frequency of chats as shown in the graph depicts the involvement of participants of Group-A more on Social media as compared to Group-B people. It can be deduced from data that youngsters are spending more time on these social media communication as compared to adults.

Sentiment analysis of WhatsApp Chat for the age group 18-23 years is shown in the Figure 4. It shows 71% of the students communication portrays positive emotions in terms of anticipation, joy, positive, surprise, trust. However 29% of the communications have negative emotions in terms of sadness, fear, disgust, anger.

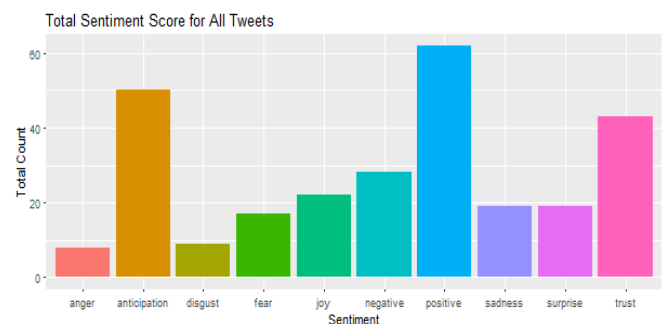


Fig 4: Sentiment Graph of Student Age Group-18-21 years

WhatsApp Chat of Group-B for the age group 30 to 45 years is shown in the Figure 5. It shows 85.6% of the people communication portrays positive emotions, joy and trust in

chatting in the WhatsApp Group Chat. And 14% of the communication has sentiments in terms of negative emotion, sadness, fear and surprise.

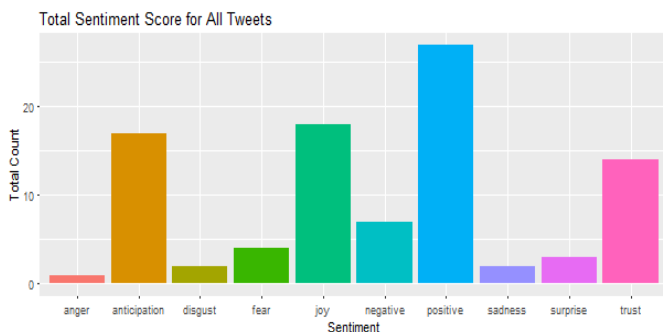


Fig 5: Sentiments Graph of Age Group 28-45 years

The analysis shows that Sentiment of people varies with age as grown-ups are using social media tool for communicating in positive frame of mind. However, when youngsters communication over social media is observed it shows that discussion amongst the group has mixed of emotions. The negative sentiments chats also make major segment of their discussions.

There's no official medical recognition of social networking addiction as a disease or disorder. Still, the cluster of behaviors associated with heavy or excessive use of social media has become the subject of much discussion and research.

V. CONCLUSION AND FUTURE SCOPE

It can be concluded that Social Media data can be used to provide sentiment analysis of users. It was observed that youngsters are spending more time on Social media as compared to adult group. Even the sentiment analysis of young group is far varied as compared to adult group. Adult group demonstrates more of positive communication than young group. The amount of time spend on communication in social media has negative impact on the growth of today's youth. In future work we will try predicting the behaviour of students from their chats on the social media. It has been concluded that social media is a powerful and reliable source of information to know about person behaviour.

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Authors Profile

Dr. Neetu Narwal is Doctorate in Computer Science from Banasthali University, Rajasthan. Presently she is Associate Professor in the Department of Computer Science at Maharaja Surajmal Institute, GGSIP University, New Delhi. She has published more than 20 research papers in reputed International Journals including Inderscience IJDATS and conferences including IEEE, ACM and it's also available online. Her main research focus is on Web mining, Opinion Mining and Social Media mining. She has 15 years of teaching and 5 years of Industry experience.