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ANALYSIS OF AVIATION INDUSTRY FOR AGGRESSIVE DECISION MAKING

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***Abstract*— Big Data Analytics is very useful for the business users and data scientists. It is very useful to take better, faster and right decision for the organization. Organizations and individuals should exhibit the circumspection while utilizing Big Data. In this work we intend to develop a methodology for getting ethical access of big data and ethically scrutinize it to attain the business objectives. We consider the case study of aviation sector, formulate some questions to upraise the system. We attain the ethical permission from twitter for this purpose. We consider the tweets of general public as they were posted in public areas and falls under informed consent category.**

***Index Terms*— Big Data, Opinion mining, Business Analysis.**

I. INTRODUCTION

Big Data analytics is an area of computer science which defines an ability to analyze varieties of data such as structured, semi-structured and unstructured. Every day we generate and consume data. We all know that data is growing very speedy with 40% annual rate, and we will reach to about 45 Zetta bytes of data by 2020. If you talk about 2010 then at that time it was 1.2 trillion GB of data was generated. This amount of data has doubled to 2.4 trillion gigabytes in year 2012 and to about 5 trillion gigabytes in year 2014[4].

With fast innovations, frequent advancement of technology and an unexpectedly growing internet populace, structures and corporations are producing huge quantities of statistics to the melody of terabytes and even petabytes of facts. It is fact that facts being generated in very huge volumes with tremendous velocity in all multi-dependent formats like images, motion pictures, weblogs, sensor information, and so on. From all diverse sources, there may be a big call for to correctly keep and examine this giant quantity of information to make it utilizable.

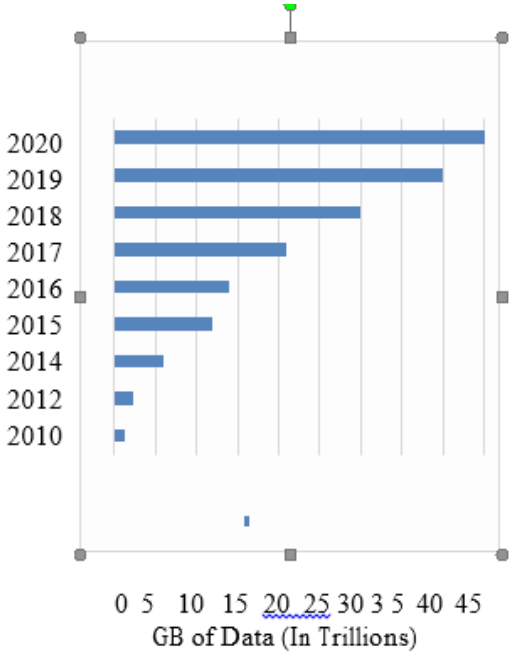

Figure 1: Growth of Data

Huge amounts of data we are creating every day. We are playing role of information consumer as well as producer nowadays. Analysis of this huge data within minimum time is challenging nowadays, not only faster output but we also need accurate information of different varieties of data. Whenever we talked about big data we must cover 3Vs of Big Data that is Variety, Velocity and Volume of data[5].

II. LITERATURE REVIEW

Big data analytics is an emerging trend for the research scholar, academicians, organizations and it has created an impact that it will be able to resolve the data related issues of any organization.
Big data analytics[1] is a procedure of gathering, forming and investigating huge amount of data ("big data") which is used to determine designs and further valuable info. Big data is not

only used to extract the meaningful information from the data, but it also helps to extract the data that is essential for the any organization conclusions. Big data analysts mostly extract the information that originates from investigating the facts[6].

Many researchers have analyzed the diversities of data. Some of the researchers has analyzed GPS data, some of the researches working on satellite data, few working on longitude data. Some of the researchers has studied the social media data. Before few months back one survey came that facebook become the users with the 2 Billion. Many people are doing marketing on social media. It plays a key role for the decision perception. Because, after analysis of social media data we can identified the perception of human behaviours and that can be used by the organization for effective decision. Social media data is nowadays analyzed by research scholars, investigators, academicians, medias and organizations[2][7].

Many organization and researchers emphasized on "Big Data" because it is a comprehensive and intellectual perception and it is highly recommended by the scholars and investigators. It is widely used technique that can be used to take right decision in favour of organizations strategy, which quickly returns the perfect result from the massive quantities of the data, which can be in any formats like CCTV footage, weblogs, social media posts etc, and stored on any geography locations[3].

III. PROPOSED METHODOLOGY

Our proposed approach is divided in two phases.

Phase 1: Planning

Step 1: Discuss with experts and decision makes to define the business objectives and make the discussion with exper ts unless the objectives are clearly defined.

Step 2: When the objectives have been determined clearly, ide ntify the stakeholders that would be involved in attainin g the objectives.

Step 3: Frame ethical questions that must be answered to attain the objectives

Phase 2: Evolution

Step 1 : Acquire the ethical approval from social media from where data is to be collectd
Generally approval not given in cases of high risk area of research, threats to security, disturbance of hormonal integrity of society, un aware of negative connotations of # -they are then labelled as 'racist', nudity etc.

Step 2: If approval is not found, reframe the ethical evaluation questions. If found review and revise different data coll ection tools and also determine the correct hashtags.

Step 3: Obtain the consent from concerned stakeholders

- Find out what the user consented to at the time of data capture? Terms and conditions.
- Is the data 'open access'
- why is it being passed on? Need to be clear about this
- Context of posts/tweets is important or may be deleted. Need to address this.
- Is the data from a 'real' identity?
- Too many "participants" (Informed consent)

Step 4: Collect social media data

Phase 3: Decision Making

Step 1: Perform Ethical Analysis of data gathered from social media

- Pre-processing of Data(Posts/tweets)
  - Removing Multiple tweets from same perso n
  - Removing weblinks
  - Removing special symbols
  - Removing English stopwords
- Calculating the score of each Posts/ tweets
  The approach here is to estimate the affirmative a nd depressing words in
  each tweet /post and set the confidence level. In th is way, we can confirm the affirmative or depressi ng extent of the twee.
  However, there are manifold ways to compute the se points; here is one formula for performing such calculations.
  - result = Number of affirmative words - Number of depressing words
  - If result > 0, then the tweet/post has encoura ging reaction
  - If result < 0, then that the tweet/post has une nthusiastic reaction
  - If result = 0, then that the tweet/post has disi nterested reaction"
- Representing analysis using graphs

Step 2: Answer the questions framed in step 3 of phase 1 on th e basis of positive, negative and neutral reactions and pl otted graphs.

Step 3: Utilize the knowledge in attaining business objectives

IV. EXPERIMENTAL EVALUATION

We considered the case study of aviation sector, formulate some questions to upraise the system. We attain the ethical permission from twitter for this purpose. We consider the tweets of general public as they were posted in public areas and falls under informed consent category. We implemented our proposed methodology in R Language.

As we considered the case study of aviation system, we derived some questions as follows:

- Which airline is being rated highly by customers?
- What is the rating pattern of customers?
- What are the problems being faced by customers?
- What are the facilities being expected by customers?

With the proper consent of twitter we performed ethical analysis to attain business objectives. Generated results are as follows:

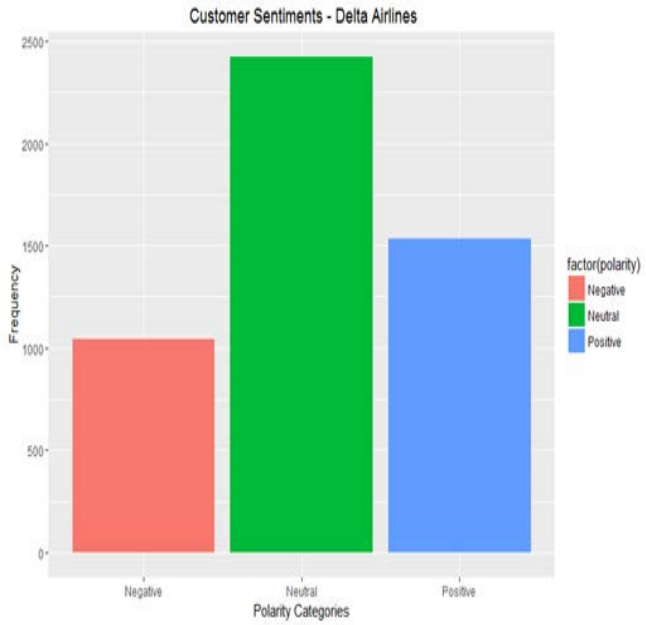

Figure 2: Customer Sentiments (Delta Airlines)

The bar graph shown in figure 2 depicts divergence, if we intimately analyze the graph; it divulge that among 5,000 twitter users, 1,100 twitter users have commented in a pessimistic way, 2,380 users are on middle-of-the-road. Nevertheless, 1,520 users are pretty affirmative about the airline.

Customer reaction Scores (Delta Airlines)

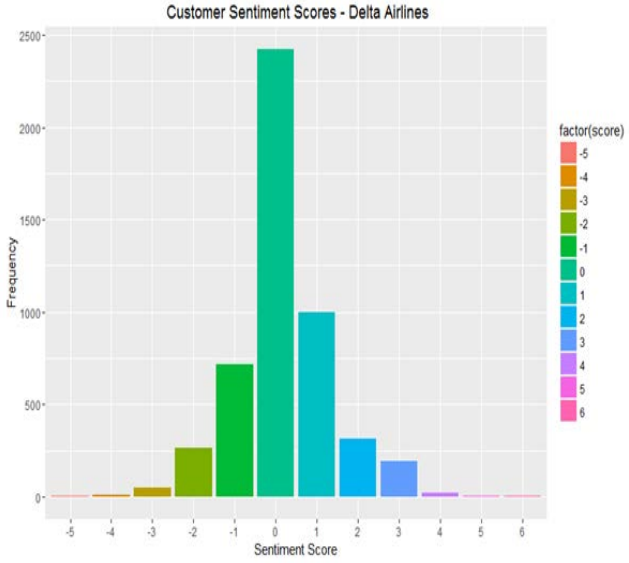

Figure 3: Customer Sentiments Scores (Delta Airlines)

The bar graph shown in figure 3 portrays twitter user's sentiment score, pessimistic score symbolized by the (-) symbol, which designate despondency of users with the airline, while the affirmative score indicate that users are blissful with the airline. Zero characterizes that twitter users are neutral.

Polarity Plot – Customer reactions (JetBlue Airlines)

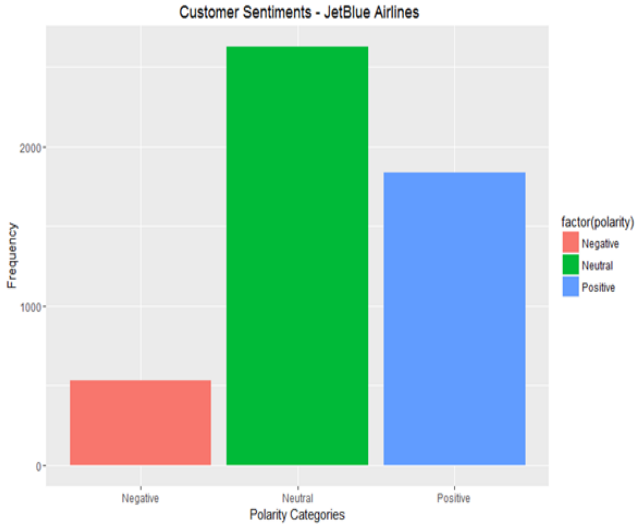

Figure 4: Customer reactions (JetBlue Airlines)

The bar graph shown in figure 4 represents polarity. In this case, among 5,000 twitter users, 550 users have commented pessimistically, 2,700 users stay neutral, whereas 1,750 users are optimistic about the airline.

Customer reaction Scores (JetBlue Airlines)

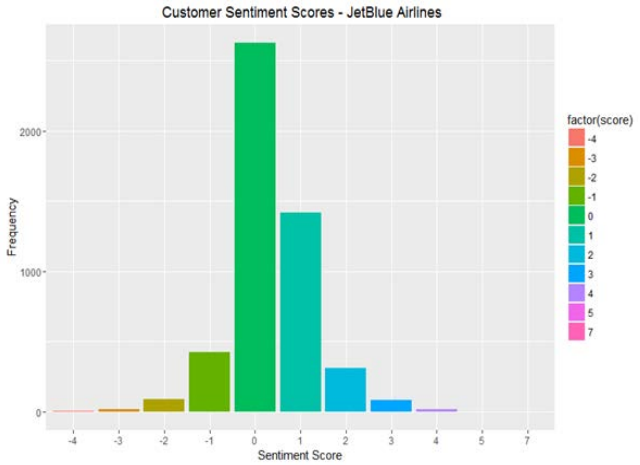

Figure 5: Customer sentiments Scores (JetBlue Airlines)

The bar graph of figure 5 depicts twitter user's sentiment score, negative score denoted by the (-) symbol, which indicates unhappiness with the airline, whereas the positive score denotes that users are quite happy. Whereas, zero here represents that users are neutral.

Polarity Plot – Customer reactions (United Airlines)

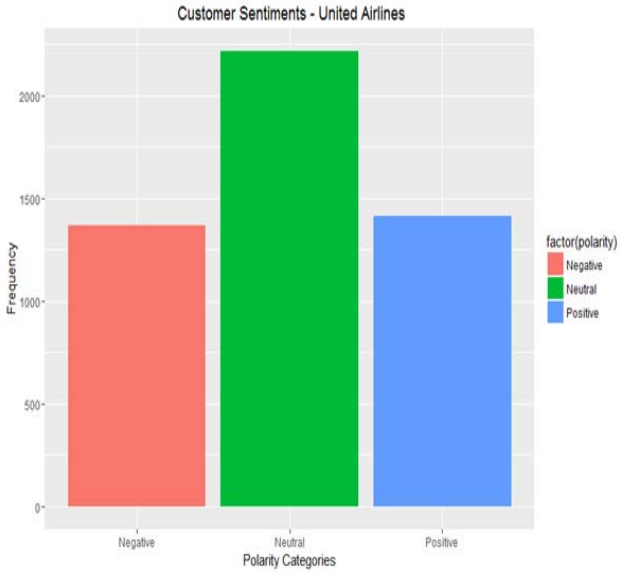

Figure 6: Customer sentiments (United Airlines)

The bar graph of figure 6 represents polarity. In this case, out of the 5,000 twitter users, 1,350 users have commented negatively, whereas 2,200 users are neutral and remaining 1,450 users remain positive about the airline.

Customer Sentiment Scores (United Airlines)

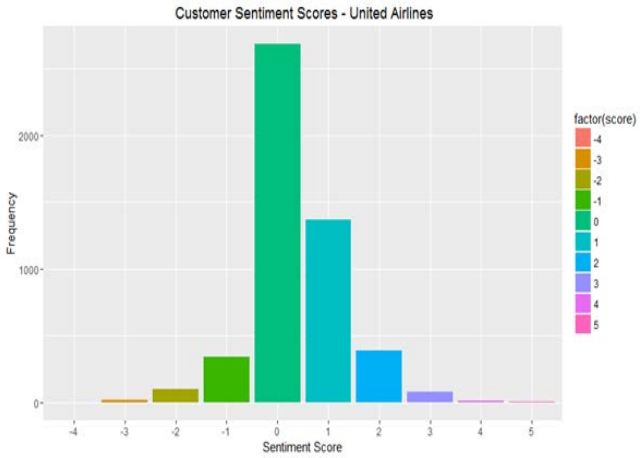

Figure 7: Customer sentiments scores (United Airlines)

The bar graph of figure 7 depicts twitter user's sentiment score, negative score denoted by the (-) symbol indicates unhappiness of users with the airline, whereas the ipositive score denotes that users are quite happy. While, zero represents that users are neutral about their opinion.

Comparison Charts

Positive Comparative Analysis

The pie chart below represents positive percentage score of these airlines.

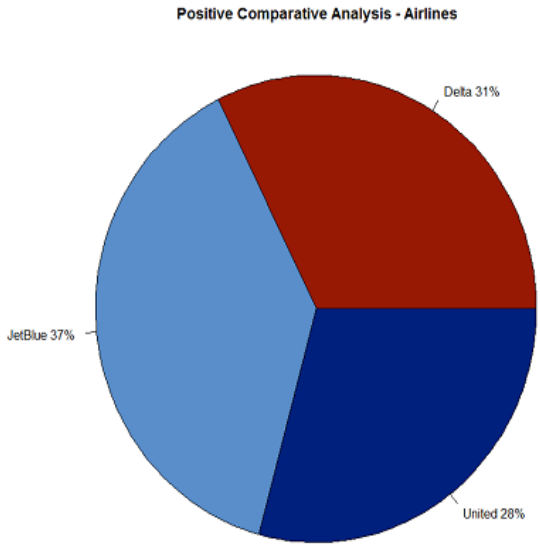

Figure 8: Positive Comparative analysis

Negative Comparative Analysis

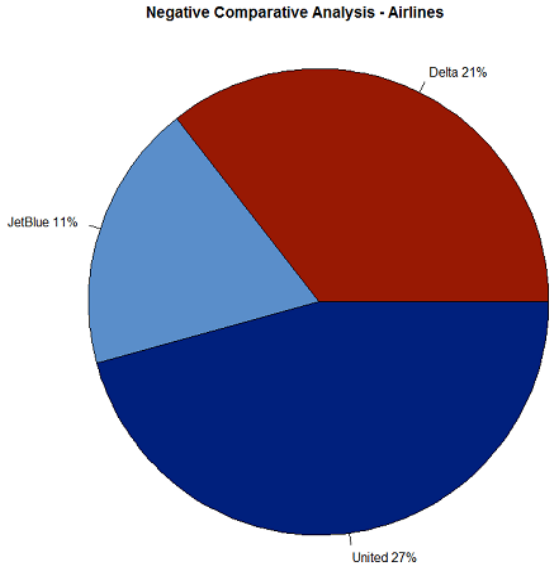

Figure 9: Negative Comparative analysis

Neutral Comparative Analysis

The pie chart below represents neutral percentage score of these three airlines.

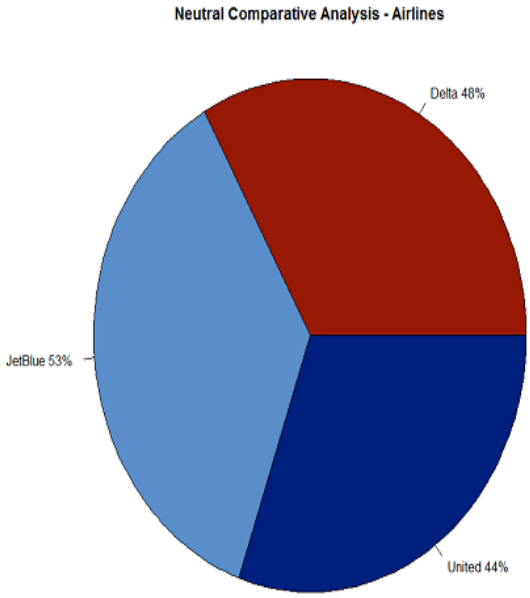

Figure 10: Neutral Comparative analysis

Thus by using above analysis any business objectives van be attained.

V. CONCLUSION

In this work, we aimed to devise a methodology for obtaining moral access to large data and morally analyzing it to achieve business objectives. We took the case study for the aviation sector and formulated some questions to upgrade the system. We have obtained a moral permission from Twitter for this purpose.

We looked at public tweets where they were posted in public a reas and fall under the category of prior approval. We consider the use of leading US aircraft (Delta, JetBlue and United Airli nes) to demonstrate the fundamentals of ethical interaction ana lysis. By using the various steps in the proposed curriculum, w e conducted a moral analysis and generated answers to pre-formulated questions.

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