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Analysis on Reaction of Covid 19 Vaccinations

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Abstract: ***The effect of vaccination coupled with the behavioural response of the population is not well understood. Our model incorporates two important dynamically varying population behaviours: level of caution and sense of safety. Level of caution increases with infectious cases, while an increasing sense of safety with increased vaccination lowers precautions. In this we are propose unsupervised machine learning algorithm called KMEANS clustering to predict people's reaction on COVID19 vaccines. To implement this project we are using tweets dataset on COVID19 vaccines from KAGGLE website. If Dataset contains unstructured text data and then by applying NLTK and then will extract peoples sentiments describe in each tweet and then generate train and test data for unsupervised clustering. After divide dataset into train and test where application used 80% dataset for training and 20% dataset to calculate clustering algorithm prediction accuracy. Finally our proposed model will predict people's response from each tweet.***

Keywords: kmeans algorithm, positive, negative, neutral reactions, graph response

I. INTRODUCTION

Coronavirus Disease 2019 (COVID-19) began as a localized outbreak in Wuhan, China in December 2019 and quickly spread internationally to become a global pandemic. More than a year later, over 113 million people have become infected with COVID-19 with more than 2.5 million deaths worldwide1. To combat the spread of this virus, the Pfizer–BioNTech COVID-19 vaccine was approved in the United Kingdom on December 2, 2020, and the Pfizer–BioNTech and Modern vaccines were subsequently approved for emergency use authorization in the United States3.A critical aspect of COVID-19 vaccination that remains unexplored is a population's behavioural changes during the prolonged period of vaccination. While behavioural responses have not been addressed with respect to vaccines, efforts have been made to study the effects of non-vaccine related behavioural changes for previous pandemics. These studies vary from the models on the effectiveness of social measures like quarantining and social distancing to characterizing the nature of spread of the disease.

The analyses of near real-time social media big data benefit public health authorities by enabling them to monitor public attitudes and opinions towards vaccine-related information in a geo-aware manner, address the concerns of vaccine skeptics, and promote the confidence that individuals within a certain region or community have towards vaccines. Advancements of deep learning-based language models have been promising for sentiment analysis with data from social networks such as Twitter. Given the situation with COVID-19 pandemic, different countries had different peaks where rise and fall of new cases affected lock-downs which directly affected the economy and employment An increasing trend in positive sentiment in conjunction with a decrease in negative sentiment were generally observed in most states, reflecting the rising confidence and anticipation of the public towards vaccines. The overall tendency of the 8 types of emotion implies that the public trusts and anticipates the vaccine. This is accompanied by a mixture of fear, sadness, and anger. Critical social or international events or announcements by political leaders and authorities may have potential impacts on public opinion towards vaccines. These factors help identify underlying themes and validate insights from the analysis. **T**he development and deployment of COVID-19 vaccines have been rapidly advancing via global efforts. Hence, it is crucial for governments, public health officials, and policy makers to understand public attitudes and opinions towards vaccines, such that effective interventions and educational campaigns can be designed to promote vaccine acceptance.

This project is to investigate public opinion and perception on COVID-19 vaccines. We investigated the spatiotemporal trends of public sentiment and emotion towards COVID-19 vaccines and analyzed how such trends relate to popular topics found on Twitter.

II. RELATED STUDY

A. Haque and A. B. Pan designed the first concept and named Efforts at COVID-19 vaccine development: Challenges and successes which was described as the rapid spread of SARS-CoV-2, the new coronavirus (CoV), throughout the globe poses a daunting public health emergency. Different preventive efforts have been undertaken in response to this global health predicament; amongst them, vaccine development is at the forefront.

Several sophisticated designs have been applied to create a vaccine against SARS-CoV-2, and 44 candidates have already entered clinical trials. At present, it is unclear which ones will meet the objectives of efficiency and safety, though several vaccines are gearing up to obtain emergency approval in the U.S. and Europe. This manuscript discusses the advantages and disadvantages of various vaccine platforms and evaluates the safety and e cacy of vaccines in advance stages. Once a vaccine is developed, the next challenge will be acquisition, deployment, and uptake. The present manuscript describes these challenges in detail and proposes solutions to the vast array of translational challenges. It is evident from the epidemiology of SARS-CoV-2 that the virus will remain a threat to everybody as long as the virus is still circulating in a few. We need affordable vaccines that are produced in sufficient quantity for use in every corner of the world.

S. P. Kaur and V. Gupta gave a comprehensive status report that the current COVID-19 pandemic has urged the scientific community internationally to find answers in terms of therapeutics and vaccines to control SARS-CoV-2. Published investigation mostly on SARS-CoV and to extent on MERS has taught lessons to vaccination strategies to this novel coronavirus. This is attributed to the fact that SARS-CoV-2 uses the same receptor as SARS-CoV on host cell i.e. human Angiotensin Converting Enzyme 2 (hACE2) and is approximately 79% similar genetically to SARS-CoV. Though the efforts on COVID-19 vaccines started very early, initially in China, as soon as the outbreak of novel coronavirus erupted and then world-over as the disease was declared a pandemic by WHO. But we will not be having an effective COVID-19 vaccine before September, 2020 as per very optimistic estimates. This is because a successful COVID-19 vaccine will require a cautious validation of efficacy and adverse reactivity as the target vaccinee population include high-risk individuals over the age of 60, particularly those with chronic co-morbid conditions, frontline healthcare workers and those involved in essentials industries. Various platforms for vaccine development are available namely: virus vectored vaccines, protein subunit vaccines, genetic vaccines, and monoclonal antibodies for passive immunization which are under evaluations for SARS-CoV-2, with each having discrete benefits and hindrances. The COVID-19 pandemic which probably is the most devastating one in the last 100 years after Spanish flu mandates the speedy evaluation of the multiple approaches for competence to elicit protective immunity and safety to curtail unwanted immune-potentiation which plays an important role in the pathogenesis of this virus. This review is aimed at providing an overview of the efforts dedicated to an effective vaccine for this novel coronavirus which has crippled the world in terms of economy, human health and life.S. Zafar et al gave the detailed description about the Current Developments and Further Opportunities in Drug Delivery and Therapeutics such has SARS-CoV-2 has affected people from all age groups, races and ethnicities. Given that many infected individuals are asymptomatic, they transmit the disease to others unknowingly, which has resulted in the spread of infection at an alarming rate. This review aims to provide an overview of the pathophysiology, preventive measures to reduce the disease spread, therapies currently in use, an update on vaccine development and opportunities for vaccine delivery. The World Health Organization has advised several precautions including social distancing, hand washing and the use of PPE including gloves and face masks for minimizing the spread of SARS-CoV-2 infection. At present, several antiviral therapies previously approved for other infections are being repositioned to study their efficacy against SARS-CoV-2. In addition, some medicines (i.e., remdesivir, chloroquine, hydroxychloroquine) have received emergency use authorisation from the FDA. Plasma therapy has also been authorised for emergency use for the treatment of COVID-19 on a smaller scale. However, no vaccine has been approved so far against this virus. Nevertheless, several potential vaccine targets have been reported, and development of different types of vaccines including DNA, mRNA, viral vector, inactivated, subunit and vaccine-like particles is in process. It is concluded that a suitable candidate delivered through an advanced drug delivery approach would effectively boost the immune system against this coronavirus.

Nijhum Paul,Swapna S. Gokhale gave a report on Analysis and Classification of Vaccine Dialogue in the Coronavirus Era as the coronavirus tears through our global community, the world pins its hopes on the expedient availability of a safe and effective vaccine. In the U.S, however, mere mention of vaccines galvanizes a community that remains steadfastly opposed to them. This paper analyzes the vaccine dialogue on Twitter in the coronavirus era, using the data collected a week after President Trump's announcement of Operation Warp Speed. These tweets are explored in three ways. Informal opinion mining reveals both concerns and support; the anti-vaxx community is vociferous in opposing the vaccine, spreading misinformation, spinning conspiracies and whipping hysteria. Significant hesitation about the safety of the Covid-19 vaccine is also expressed in particular because of its rapid deployment. The pro-vaxx community counters this opposition by pointing to prior successes of immunizations as well as by mocking the anti-vaxx attitudes. A comparison of the social features of the anti-vaxx and pro-vaxx tweets suggests that the anti-vaxx community has gained steam on social media platforms and is better connected than the pro-vaxx community, which may lead to a penetration of discordant information through the online world. Identifying and labeling tweets that sow discordant information is one way to prevent their spread, which is facilitated by our classification framework that can distinguish between the anti-vaxx and pro-vaxx tweets with an accuracy of over 80%.

Taken together, our results suggest that unless a concerted effort is made to dispel these myths and misgivings, the fringe anti-vaxx minority is likely to become an outspoken majority by dragging many skeptics into their fold, and hence, hinder herd immunity.

A. Existing System

As the COVID-19 vaccination process was initiated , people started expressing their opinions on the same. It has been mandatory to analyze what are the sentiments of people for the COVID-19 vaccine. Sentiment analysis is a process by which opinions and judgments are identified by computationally analyzing a piece of text. Every tweet had some sentiment, it may be positive, negative, or neutral for the vaccine. Our first task was to find the sentiment polarity of all the tweets. Sentiment polarity for a tweet defines the expression as positive, negative, or neutral. This indicates what the tweeter wants to express via the tweet. This analysis helps us to get an idea of what impact has the COVID-19 vaccine has made in the world.

B. Disadvantages Of Existing System

Only tweets were stored in dataset but analysis was not done.

C. Proposed System

Broadly classified into objectivity, subjectivity identification and feature, aspect-based sentiment analysis, different strategies are implemented to analyze the sentiments. Opinion mining is mainly focused on document level, sentiment level, and aspect level sentiment analysis. Data science has emerged a lot over the last few years.

We are able to predict various parameters and analyze a lot of things for any given type of issue. Using one of the data science features to perform the sentiment analysis, we have incorporated various results in our study. It is mandatory to know what is the opinion of the people on any situation or any given topic. People generally express these sentiments in the form of tweets on Twitter. By getting all these tweets, a study can be incorporated to check whether people take the scenario positively or negatively. As we know, different Machine Learning (ML) techniques have been adopted to analyze sentiments on texts. These algorithms are used to do the sentiment analysis of any dataset containing tweets. A particular topic or a scenario is generally analyzed by using these algorithms.

In this we are proposing unsupervised machine learning algorithm called KMEANS clustering to predict people's reaction on COVID19 vaccines. To implement this project we are using tweets dataset on COVID19 vaccines from KAGGLE website.

D. Advantages Of Proposed System

1) Using K-means clustering, the algorithm does its prediction quickly.
2) easy to implement
3) By getting all these tweets, a study can be incorporated to check whether people take the scenario positive, negative and neutral responses on COVID19 vaccine.

III. THE ARCHITECTURE OF THE PROJECT

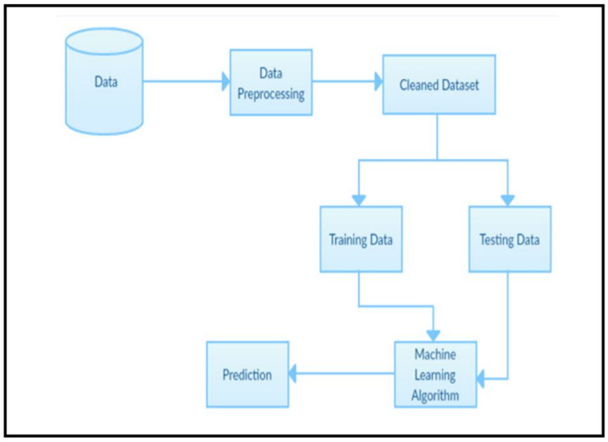


Fig 1: System Model

This system consists the vaccinated peoples data collected from kaggle website and here after the data is collected it is preprocessed by which the data gets cleaned by converting it into structured format .The clean data set is then divides into training and testing .And then the algorithm KMEANS is applied to the structured data where it classifies the positive,negative and neutral reactions of the vaccinations and predict the responses in graph format.

IV. IMPLEMENTATION

A. Uploading Data

Upload the collected data of covid 19 vaccination from the website.

B. Preprocess data

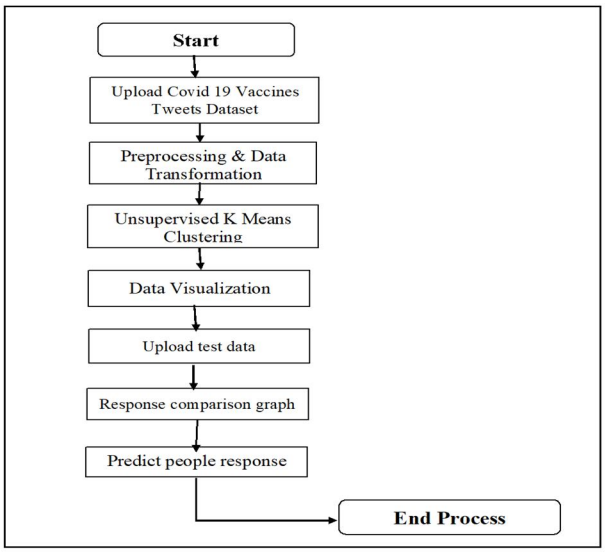
The collected unstructured data is now converted into structured format by removing all the stop words, punctuations etc.

C. Apply kmeans Algorithm

Here we apply kmeans algorithm on the collected data and then the data is now divided into the similar clusters. Such as positive reactions, negative reactions, neutral reactions.

D. Predict Response

Here the reactions now are shown in the graph format according to the numbers of reactions in each different phases.



Test cases and Scenarios

TEST CASE ID	TYPE OF TESTCASE	DESCRIPTION	INPUT	REMARKS
1	Unit testing	Upload tweets	Text file	Testcase success
2	Unit testing	preprocessing	--	Testcase success
3	Unit testing	Data visualisation	--	Testcase success
4	Unit testing	Upload test tweets	Text file	Testcase success
5	Unit testing	response	--	Testcase success

V. CONCLUSION & FUTURE SCOPE

A critical aspect of COVID-19 vaccination that remains unexplored is a population's behavioural changes during the prolonged period of vaccination. While behavioural responses have not been addressed with respect to vaccines, efforts have been made to study the effects of non_vaccine related behavioural changes for previous pandemics.so, we want know people reaction on covid19 vaccines. So, we proposed unsupervised machine learning algorithm called KMEANS clustering to predict people's reaction on COVID19 vaccines. To implement this project we are using tweets dataset on COVID19 vaccines from KAGGLE website. Finally, machine learning KMEANS will predict people's response from each tweet.

The COVID-19 Pandemic Served As A Wakeup Call For The Scientific Community. In Addition To The Existing COVID-19 Vaccines, Hundreds Are In Development; Including Dozens In Phase 3 Trials, Meaning They Will Soon Be Available To The Public. Also In Development Are Therapies That Could Cover Viral Strains That Aren't Even Out In The Wild Yet; As Well As Those To Treat Patients Already Suffering From COVID-19 Symptoms. So Let's Explore What Awaits Us In The Future For COVID-19 Therapies. As We Get An Analysed Report On Covid 19 Vaccinations Whether They Are Showing Positive,Negative Or Neutral Behavior Towards People It Will Be Easy For The Future Generation To Take Up The Vaccine.

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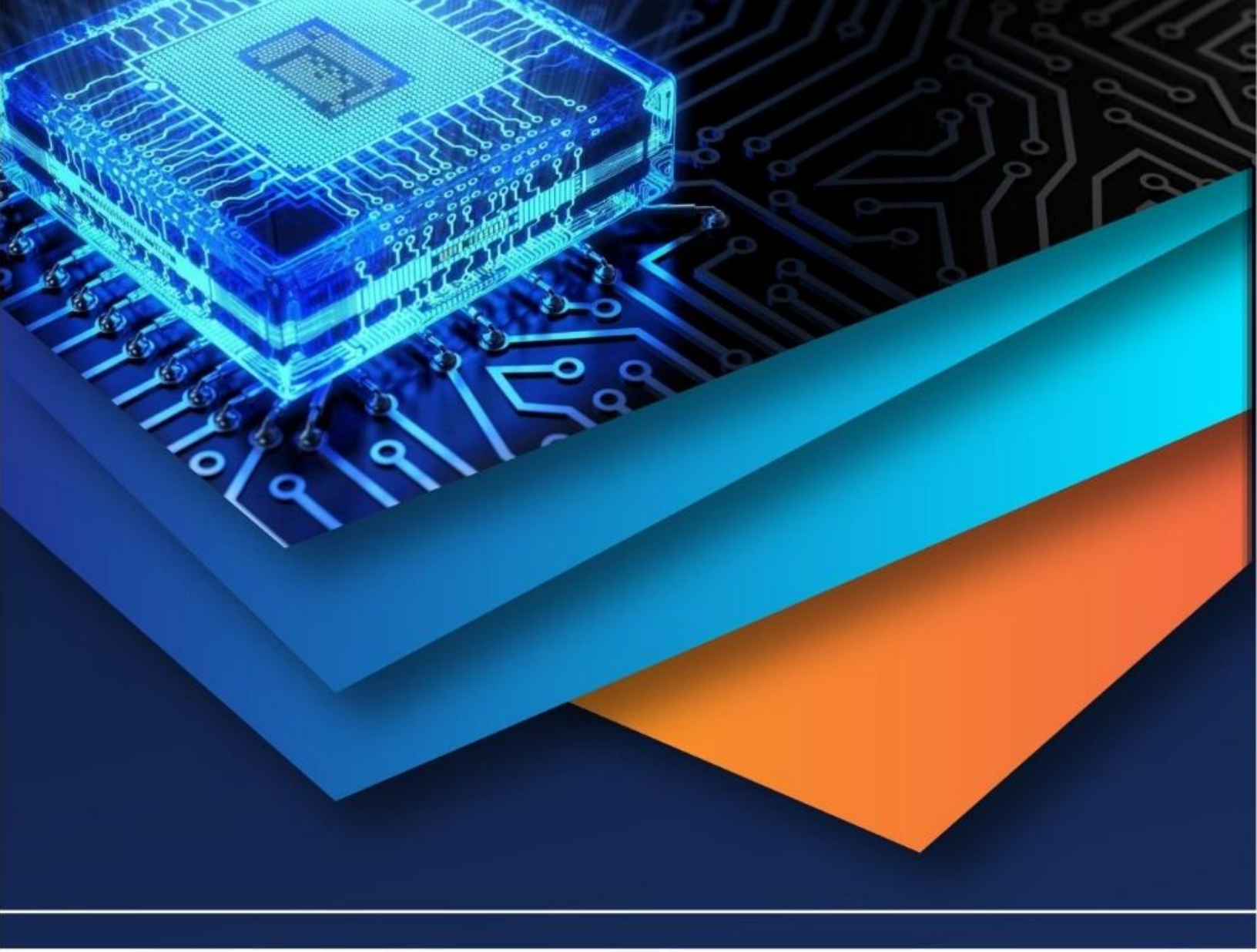

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