PUBLIC REACTION TOWARDS COVID 19 VACCINATION THROUGH TWITTER BEFORE AND AFTER THE SECOND WAVE

TRAINING/INTERNSHIP/PROJECT REPORT

Submitted in partial fulfillment of the requirements for the award of the degree

Of

BACHELOR OF TECHNOLOGY

In

Computer Science and Engineering

By

Kavita Meena
15501012019

Guided by

Rishabh Kaushal
Assistant Professor
IT Department, IGDTUW

INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN
NEW DELHI – 110006
JULY 2021

CERTIFICATE

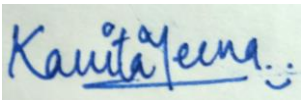
This is to certify that the project entitled **"Public Reactions towards Covid-19 Vaccination through Twitter before and after Second Wave in India"** is being submitted at IGDTUW, Delhi for the award of **Bachelor of Technology** in **Computer Science and Engineering** degree. It contains the record of bonafide work carried out by **KAVITA MEENA and 15501012019** under my supervision and guidance. It is further certified that the work presented here has reached the standard of B.Tech and to the best of my knowledge has not been submitted anywhere else for the award of any other degree or diploma.

RISHABH KAUSHAL
(Assistant Professor)
Department of Information Technology
Indira Gandhi Delhi Technical University for Women

Date: 18-11-2021
Place: New Delhi

UNDERTAKING REGARDING ANTI-PLAGIARISM

I, ***Kavita Meena*** hereby, declare that the material/ content presented in the report is free from plagiarism and is properly cited and written in my own words. Any academic misconduct and dishonesty found now or in future in regard to above or any other matter pertaining to this report shall be solely and entirely my responsibility. In case, plagiarism is detected at any stage, I shall be solely responsible for it.



Kavita Meena

(15501012019)

ACKNOWLEDGEMENT

I extend my supreme gratitude to Indira Gandhi Delhi Technical University for Women for providing such kind of opportunity for students to broaden their perception of how the real world in the field of Computer Science and Engineering looks like as well as organizing the whole internship program and its effort to make sure that the whole internship program to achieve its desired goals.
I am grateful to Mr. Rishabh Kaushal for mentoring and guiding me throughout the internship program. I am thankful to my fellow mates with whom I learned and completed the project during the internship program.
Finally, I would like to express my special thanks to my family and friends for helping me in all aspects and appreciate me spending my all-time in the workplace during my internship time.

Kavita Meena

(155010102019)

DECLARATION

Here, the student should declare that the work presented in the report is original and has been completed entirely by the student, with the help of the mentioned supervisors and references.

Example :

I, **Kavita Meena**, solemnly declare that the project report, **PUBLIC REACTION TOWARDS COVID-19 VACCINATION THROUGH TWITTER BEFORE AND AFTER SECOND WAVE,** is based on my work carried out during the course of our study under the supervision of **Rishabh Kaushal, IT, IGDTUW**. I assert the statements made and conclusions are drawn are an outcome of my research work. I further certify that:

I. The work contained in the report is original and has been done by me under the supervision of my supervisor.
II. The work has not been submitted to any other Institution for any other degree/diploma/certificate in this university or the any other University of India or abroad.
III. We have followed the guidelines provided by the university in writing the report.
IV. Whenever we have used materials (text, data, theoretical analysis/equations, codes/program, figures, tables, pictures, text, etc.) from other sources, we have given due credit to them in the report and have also given their details in the references.

Kavita Meena

(15501012019)

ABSTRACT/SUMMARY

COVID-19 has had a tremendous impact on every aspect of our lives, our daily schedules, our physical health, the environment and financial stability. Social media has created new styles of communication for us, which made huge impact on everyday lives of the people. Social media has a strong public impact. Vaccination in India started in January 2021. Rapid progress in the development and deployment of COVID-19 vaccines has been achieved through global efforts. The potential for vaccines to disrupt the transmission of COVID-19 depends not only on the technical effectiveness of the distribution of vaccines, but also on the willingness of a large proportion of the public to be vaccinated.

A lot of opinions verse was observed, as vaccination is one of the most crucial steps toward the fight against COVID-19. governments, public health officials and decision-makers need to understand public attitudes and opinions about vaccines. In this internship, the public view towards COVID-19 immunization in India was compared before the second wave and after the second wave. This research work is under consideration for public issue.

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CHAPTER 1: INTRODUCTION

1.1 Problem Statement

The COVID-19 pandemic has caused dramatic loss of life around the world and poses an unprecedented challenge to public health and food systems. During the COVID-19 crisis, food security, public health, employment, and labour, particularly the health and safety of workers, converge. The pandemic has led to a massive loss of human lives worldwide. Due to such huge losses and gloomy news of the impact of Covid-19, the mental health of people has suffered immensely. Due to such huge loss and disappointment, people are unsure of the Covid 19 vaccination. They suspected its efficiency. There is a hesitancy and uncertainty amongst the public due to fear of side effects, misinformation, difficulty in registration/slot bookings, and many more.

1.2 Scope of the project

In this project, response and public views on COVID-19 vaccinations from a social media perspective was indicated. With COVID-19 resulting in social distancing and lockdown, many users had no choice but to voice their opinions and feelings on social media platforms like Twitter. The work focused on the Indian vaccination campaign, which began on 16 January 2021, when 165,741 people were vaccinated on the first day. Massive public awareness campaigns were run to encourage people to get vaccinated, and rigorous planning was put in place to deal with the large-scale outbreak.

The project concentrated on identifying and defining people's attitudes on Covid-19 vaccination in India, which is beneficial in the following ways: (i) It would assist authorities in analysing people's apprehension toward vaccination drives so that public awareness campaigns can be implemented accordingly; (ii) It would also assist investors, shareholders, and companies in determining which vaccine is more popular among people and draws positive sentiments; (iii) It would assist the general public in understanding the opinions of other users, thereby assisting them in formulating their own opinions.

1.3 Approach

The work was initiated by extracting tweets regarding vaccination in India, building our datasets. 5,977 tweets before the second wave and 42,936 tweets after the second wave were extracted. The tweets received were categorized as Provaccine, Antivaccine, Hesitant and Cognizant. The sentiment analysis was carried out by establishing a baseline model, and Random Forest using the TF-IDF vectorization technique gave the best accuracy of 69% using max-features and n-estimators as parameters.

CHAPTER 2: METHODOLOGY

The research work was begun by extracting Covid-19 related tweets from Twitter before the second wave and after the second wave, hence building the datasets. My major contributions were working on the dataset of after the second wave and then comparing the results of before the second wave and after the second wave. The datasets were pre-processed and annotated in four classes namely, pro-vaccine, anti-vaccine, vaccine-hesitant, and vaccine cognizant. As the work focused on comparing the public sentiments before the second wave and after the second wave; there was a noticeable change in the increase of vaccine-cognizant tweets after the second wave. The vaccine hesitant tweets were also observed to be reduced by half after the second wave.

To obtain the results, baseline machine learning algorithms were performed on the classification of tweets. The experiments were done using the following machine learning algorithms: Logistic Regression, Gradient Boosting, Random Forest, Decision Tree, and K-Nearest Neighbours along with text vectorisation techniques. I also contributed in performing a standard technique of back translation in which English tweets were converted into French and then converted the French translation back to English. For each machine learning model, hypertuning process was performed to improve their performance. The accuracy of different machine learning algorithms and vectorization techniques were compared. A random forest classifier obtained the best average accuracy considering all datasets using the TF-IDF vectorization technique.

CHAPTER 3: RESULTS

Using opinion mining and textual analysis, it was discovered that the majority of tweets before the second wave and after the second wave belong to the cognizant class, indicating that tweets are mostly used to disseminate knowledge about the vaccination process. people's opinion and sentiments after the second wave of Covid-19 were more predictable with better clarity. Furthermore, individuals have a more positive attitude about vaccination than those who are opposed to it, yet a considerable number of people are hesitant to be vaccinated. Based on the results of the baseline test, it was determined that random forest employing the TF-IDF vectorization approach provided the best accuracy of 69%.

CHAPTER 4: CONCLUSION

The topic of public sentiment analysis in India in relation to the Covid-19 vaccine campaigns discussed in this project. A new dataset of tweets in this study that was divided into four categories: provaccine, antivaccine, hesitant, and cognizant was created and analysed. Furthermore, the tweets before and after the second wave were recorded.

In India, there was a surge of Covid-19, which helped us identify the differences in immunisation attitudes.
By performing baseline evaluation, we conclude that random forest using TF-IDF vectorization technique gave the best accuracy of 69%.

CHAPTER 5: FUTURE SCOPE

The data can be used to further study in the field of vaccine sentiment analysis. This research into vaccine sentiment can be expanded to assess the level of satisfaction and popularity of various vaccinations on the market. It would help the government to choose and order the popular vaccine and wade away the vaccine hesitancy. This work can be used by government authorities to determine and predict the current sentiment of people toward vaccination and accordingly create campaigns to address the concerns and apprehensions of people. In this work, we have only focused on tweets from India, which can be extended to study and analyze the sentiment globally for a different country that has a significant amount of hesitancy toward vaccination in public.

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RESUME

KAVITA MEENA

Kavita23meena.2002@gmail.com | (+91)8447334121

EXPERIENCE

- Research Intern **|** Prof. Ravinder M, Assistant Professor at IGDTUW
  Worked on a Review paper based on Image Enhancement Techniques

- Research Intern | Prof. Rishabh Kaushal, Assistant Professor at IGDTUW
  Contributed in the research work –"Public Reaction towards Covid 19 vaccination through Twitter before and after the second wave".

EDUCATION

- B.Tech (Computer Science and Technology) | Indira Gandhi Delhi Technical University for Women (2019-2023)
- XII (CBSE) | Amrita Vidyalayam
  80% | 2019

- X(CBSE) | St. Mary's Public School
  CGPA:10 | 2017

ACADEMIC PROJECTS

- Cloud Computing (06/2020 - 07/2020)
  Worked on Microsoft Azure wherein I created virtual machines, blob storage, network security group and backup for the virtual machine.

- Unialgo (01/2021 - 02/2021)
  Created an e-learning website consisting documentation and codes of different data structures in C++.

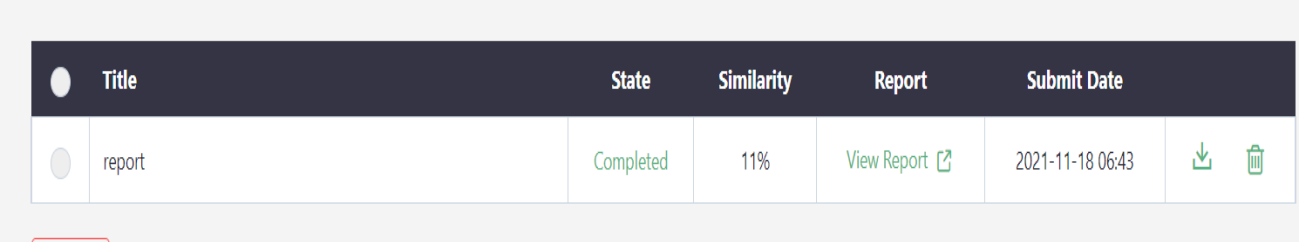
POSITION OF RESPONSIBILITY

❖ Optica student chapter of IGDTUW
Responsible for outreach activities and management of the events.
Organized an international conference on Advance and Smart Materials in Emerging Technology.
Managed and led the technical team of the event.

PROGRAMS

- Cloud Computing: Training and Internship at VERZEO (06/2020 - 07/2020)
  Trained in cloud computing on Microsoft Azure and made hands on project on it.
- Goldman Sachs Virtual Engineering Program (01/2021)
  Gained skills in basic cryptography, password cracking, and password best practices
- Girlscript Outreach Scholar (02/2021)
  Selected as a mentee in web development programme.
- Goldman Sachs Virtual Insight Series (06/2021 – 07/2021)
  Participant at GS Sophomore Virtual Summer Insight Series.
- Indian Institute of Remote Sensing- Web GIS Technology (06/2021 – 07/2021)
  Participant at IIRS e-learning course in Web GIS technology.

SIMILARITY INDEX



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