TECHNOLOGY AS A RISK

Example:
Misinformation concerning covid vaccine through Twitter

(1593 words)

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1. Introduction

In its broadest sense, technology refers to a number of activities that involve the creation of entities, both material and immaterial, for the purpose of producing something valuable. The definition of technology in this context is a term used to describe tools that are capable of solving practical problems in the real world. However, it cannot always be guaranteed that the solution provided only assists in solving problems and does not create any new ones as a result of it. A technological advancement can either provide a great deal of benefit in some cases, or it can have a horrifyingly detrimental effect in others. This paper is a reflection on how technology can occasionally have a negative impact on society and how it can negatively affect the lives of many people.

The COVID situation is something we have all experienced first hand and we have all heard various kinds of information regarding the same, among which some of the information was true and some of the information was just rumor. It is considered that spreading correct information is a wise thing to do, because spreading correct information is considered to be a form of knowledge. What, however, happens when wrong information is spread across the globe? As a result, what will happen could be unpredictable and unimaginable at the same time. It is the same case when it comes to the misinformation that is spread throughout the world in regards to the COVID vaccine.

> *"More than 500 websites have promoted misinformation about the coronavirus – including debunked claims about the vaccine , according to a firm that rates the credibility of websites" – USA Today News [1]*

Social media enables misinformation and disinformation to be spread rapidly to millions of people in the current world. According to studies, false information circulates more widely than the truth online [2]. The internet has achieved a global reach with social media, and because of its rapid amplification capacity, information can quickly be disseminated across the Internet and become reinforced, potentially resulting in what is known as the "infodemic." As we all know, excess information can have negative consequences. People across the globe have been performing seemingly harmless acts such as shaving their heads and gargling with salt water in response to the COVID-19 epidemic, but they have also committed illegal and damaging acts such as

arson in response to the epidemic. In the field of health care misinformation, it has been shown that people's attitudes toward vaccinations have been adversely affected by false and misleading claims that have been made. As a result of this infodemic, there is the possibility that it could alter the course of the pandemic by interfering with public health interventions such as mask-wearing, social distance, and vaccination. There is no doubt that vaccinations are of utmost importance in light of the current infodemic, since they hold the key to returning the population to pre-pandemic conditions.

It has been reported that the majority of the world's population has been vaccinated against COVID at least once. There is, however, evidence to suggest that vaccine hesitancy is leading to new outbreaks of diseases occurring at alarming rates in certain populations due to vaccine hesitancy. The use of social media platforms is becoming increasingly popular among those who are supporting the anti-vaccination movement, who spread misleading information about the safety and effectiveness of vaccines through the use of social media platforms [3]. We will be investigating and analyzing misinformation relating to a new vaccine for COVID on the Twitter social media platform, using sentiment analysis and proving that technology can be both hazardous and risky sometimes. It is the objective of this paper to present the findings of this analysis of the extent of worldwide exposure to the COVID infodemic via social media platforms, that is, how much misleading information is being spread as a result of tweets among all the tweets related to the COVID vaccine.

2. Research

At the end of my previous semester of my graduate studies, as part of my research on the misinformation concerning the COVID vaccine, I conducted an analysis. **The results of this study are going to be used as evidence to form the conclusions on how technology can be risky.** Before we go into the details of the study's outcomes, let us first briefly touch base on how the analysis was performed.

2.1. Data

Data source: Twitter [4]

Data: Tweets related to covid vaccine [5]

Data timeline: November 2020 – July 2021

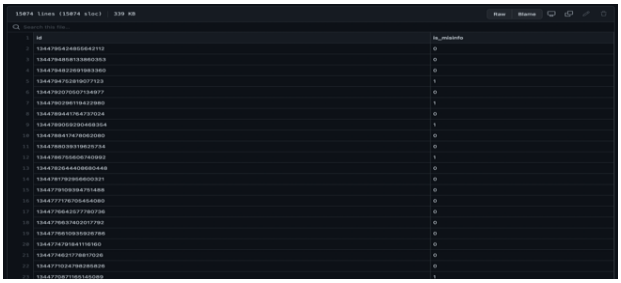

Fig 1: View of a the initial pre-existing labelled covid vaccine data.

https://github.com/SakibShahriar95/ANTiVax/blob/main/Labeled/VaxMisinfoData.csv

2.2. Analysis

In the course of this study, Naive Bayes classifier was used to train and test the model to analyze and predict tweets, as part of the analysis of twitter. Trained the model using a pre-existing dataset of 15,000 tweets as a training set in order to identify

whether a tweet contains misinformation with a score of 0 or 1 (where a score of 1 indicates a tweet contains misinformation) using the evaluate function and the predict function. After training the model and labeling the tweets, matplotlib is used to plot a bar graph representing the percentage of each type of information (whether the information is misinformation or valid information).

2.3. Results

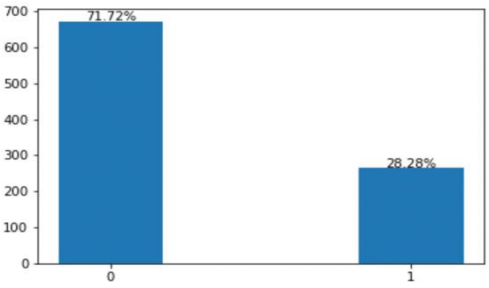

Fig 2: Bar graph showing the percentages of both valid information (0) and misinformation (1)

It was found that approximately 30% of tweets about the COVID vaccine on Twitter contained misinformation according to an analysis conducted. On Twitter, there are a large number of tweets related to the covid vaccine that are inaccurate in some way. Based on the results found in the analysis, Figure 2 depicts the main findings of the analysis, showing the percentage of valid information related to Covid vaccine, as well as the percentage of misinformation regarding it. According to the analysis of misinformation regarding covid vaccines, the following are the clear results:

Magnitude of misinformation related to covid vaccine on twitter platform:	28.28%
Magnitude of valid information related to covid vaccine on twitter platform:	71.72%
Model prediction accuracy:	97.20%

3. Conclusions

We can conclude that approximately a third of the information posted on Twitter regarding the Covid vaccine is inaccurate based on the analysis conducted. Vaccine acceptance is dependent on accurate information conveying the disease's risks and side effects to the public. In light of the public's susceptibility to and wide distribution of vaccination-related rumors, it is imperative to avoid falsehoods and spread accurate information. As an example, this would serve as a very good example to illustrate the fact that the so-called advanced and convenient technology can actually cause an infodemic that can result in some very inconvenient and life-threatening consequences. Certainly, technology has the ability to make life easier in a number of different ways, but it also holds the potential to create chaos on a global scale in various ways.

Our paper explores Twitter (social media platform) as the technology and COVID misinformation as the example situation. Based on this very example, we can approach this technology in various ways:

- **Twitter as a social actor** – This example demonstrates Twitter's relevance as a social actor, since it is a social media platform that allows users to share their thoughts, opinions, and other information with anyone worldwide.

- **Twitter as ecology** – Given the popularity of social media today, it would be safe to say that many people use Twitter as their primary platform on a daily basis as if it is part of their ecology.

- **Twitter as Agency** – Twitter plays the role of an agency, using its influence to share opinions and thoughts, regardless of their correctness or incorrectness.

- **Twitter as a material** – In this example we attempt to portray Twitter as a material of risk, i.e., a material that can be misused to spread false information.

- **TWITTER AS A RISK** – It is already apparent that Twitter, or any social media platform for that matter, holds the potential to cause a whole new level of problems.

In conclusion, even though we embrace technology for a variety of reasons, it is equally important to be aware of how we use it. Technology can pose a number of risks, Twitter is just one example. There are a number of other technologies that may contribute to the chaos and confusion in the world, such as nuclear weapons. In this regard, it is not only your responsibility to become aware of good practices in the use of technology, but it is also vital that others become aware as well.

4. References

Introduction:

[1] "COVID, vaccine misinformation spread by hundreds of websites, analysis finds", *Reporter Daniel Funke at dfunke@usatoday.com*, USA Today.

[2] : Singh K, Lima G, Cha M, Cha C, Kulshrestha J, Ahn Y-Y, et al. (2022) Misinformation, believability, and vaccine acceptance over 40 countries: Takeaways from the initial phase of the COVID-19 infodemic. PLoS ONE 17(2): e0263381. https://doi.org/10.1371/journal. pone.0263381

[3] Muric G, Wu Y, Ferrara E, COVID-19 Vaccine Hesitancy on Social Media: Building a Public Twitter, Data Set of Antivaccine Content, Vaccine Misinformation, and Conspiracies, JMIR Public Health, Surveill 2021;7(11):e30642, URL: https://publichealth.jmir.org/2021/11/e30642 DOI: 10.2196/30642

Data:

[4] Twitter website, https://twitter.com/

[5] Hayawi, Kadhim, Sakib Shahriar, Mohamed Adel Serhani, Ikbal Taleb, and Sujith Samuel Mathew. "ANTi-Vax: a novel twitter dataset for COVID-19 vaccine misinformation detection." Public Health 203 (2022): 23-30

Analysis:

Covid misinformation analysis done by me - https://github.com/VarshaRaviVarma/Social-Media-Mining-Papers/blob/main/Paper%202%20-%20Analysis%20of%20misinformation%20concerning%20%20covid%20vaccine/Code.html

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