# Spread of Fake news on Twitter: A Study

Sandhya N.S.K. Balli, Jaideep Kulkarni, Yaseswini Kannan, Pooja Patil, Vamshi S.K. Yeddula,
Ronakkumar Parekh

**Abstract - Social media in today's world has moved from a place for connecting with people to a place that acts as a source of information. It is now almost impossible to imagine a life without social media. They play a vital role in a person's everyday life. People not only share their personal affairs with their friends and families through social media but also talk about politics, healthcare, technology and whatnot. Social media has ensured that people gain new information instantly and helps them to be prepared and stay ahead in life. They now hold a crucial place in information sharing and knowledge transfer. However, they do not stop with vital information sharing. There is also the spread of misinformation on social media. This paper studies the spread of fake news on the social media platform, Twitter. This paper analyses the type of media shared on Twitter and how it can influence the spread of fake news. It investigates the source of fake news and the reasons for their generation. It also investigates who receives and shares the fake news and the reason for sharing. The paper finally examines the spread of fake news during elections and epidemics. It analyses how this fake news during elections and epidemics influences and manipulates people and concludes that the spread is more during this period.**

## I. Introduction

It s now the age of the internet revolution, and the internet is changing the shape of the world continuously. Social media plays a steady hand in this internet revolution. Everyday life now depends on the news and information that gets shared via social media. Facebook has made connecting with people much more comfortable. Twitter took to an even further level. Facebook helps in sharing of information and ideas with friends and family. In contrast, Twitter helps in sharing of information throughout the world, which makes knowledge sharing much easier for the people [1]. A person in Australia now instantly (well, almost instantly) knows about an event happening in the United States. The news about a wild forest fire in Africa spreads all over Europe. A Twitter user reported the news of Michael Jackson's death just 20 minutes after the 911 call, but it took mainstream media more than an hour to report about it [2]. Therefore, Twitter can be considered beneficial in reporting breaking news [2]. In terms of how many people a piece of information reaches, Twitter is more effective than Facebook, making it one of the reasons for choosing as the primary focus of this research paper [2].

The many positives of social media make it susceptible to fake/false information. A person on Twitter unknown to us will be able to read our tweets if our account is public. So, the reach of information is wider on Twitter. The problem arises due to the fact that not all sources of information are reliable. A person with no experience in current affairs can tweet about current affairs, and that is precisely the problem. Social bots are also generating information. For example, when people get flooded with information regarding how to lose weight efficiently from 50 dozen sources, they are overwhelmed. In the enthusiasm to follow all their ideas, they do not look for the truth behind them. At the point when individuals are encircled by nonstop tweets for a long time, they might not have the opportunity to check the source of the tweet. Thinking they are helping others, people might share a piece of information whose credibility is in question, and this results in the spread of fake news. Fake news is 'manufactured information' that imitates contents given by news media [3]. The research discusses more about what fake news is in detail.

Although there are other social networks like Facebook that have a hand in sharing fake news, the impact of that news is minimal and slow-burning. Even though there are public posts that can be posted and shared on Facebook, most people use Facebook for connecting and sharing messages within family and friends in their circle [4]. Therefore, the rate at which information spreads from one circle to another can be slow. That is not the case for Twitter. Millions of people can read tweets at the same time, and therefore, this research considers Twitter alone.

The scope of fake news sharing is extensive. It exists in every aspect and topic of information sharing. However, this paper looks at a couple of highly essential subjects of politics and health. Many people commonly use both of these topics, and fake news in these segments are highly critical.

## II. Literature Survey

One of the initial readings for this research was related to selecting which social media platform to choose. About 68% of adults in America get news from social media occasionally [5]. 43% of American adults used Facebook as a pathway to news compared to 17% on Twitter. However, Twitter has more news-centred users (71%) compared to Facebook (67%) [5]. The introduction mentions some of the key reasons for choosing Twitter as the primary focus of this research paper. While Twitter can be used to connect with friends and family like Facebook, people mostly use it for connecting with a broader audience to share trending news, real-time information and any ideas that they might have [4]. Only 13% of the accounts on Twitter is private, which suggests that 87% of the accounts on Twitter is public and anything a person posts, is available to the whole world to see [6].

Research papers and articles regarding the meaning and definition of fake news and related terms like misinformation and disinformation were studied, which provided us with a basic understanding of these terms. Readings were done on papers related to details of the sharing of information on Twitter. In general, people tend to share (retweet) information more when it comes from people they know, even if the information is of low value [7]. Also, social are used to spread

fake news, misinformation and tweets with low content value [8]. The bots retweeted any content that contained specific words or if it came from a certain person [9]. Many research papers regarding the spread of fake news related to specific events in politics, elections, epidemics and pandemics were analysed which concludes that during a crisis or an event of high impact, the spread of fake news is more [10]. This is the basis of this paper's methodology, which addresses the claim that during the times of elections or epidemics, the spread of fake news is more.

## III. METHODOLOGY

It is a qualitative research methodology that is used in this paper. From reliable research papers and articles, data were collected, arranged and organised. Based on this, the paper separates the methodology into four parts. The first part focuses on the basics of this research involving the understanding of fake news and the users of Twitter. It also researches if people are dependent on Twitter for everyday information. The second part of the methodology focuses on the nature of media that gets shared on Twitter. It will give an idea about what type of media is more prominent and gets shared quickly and is not able to be identified as fake. The third part of the methodology focuses on the spread of fake news in political situations, highlighting its influence during elections by analysing the source and audience of the information. The final part focuses on sharing of news and fake news during epidemics and its source of information, the audience and the users who share it. It also analyses whether people believe the information and are they impacted by it and how.

### A. Understanding of fake news and the users of Twitter

Fake news is the information that has been purposely manufactured and scattered to misdirect and delude others into accepting deceptions or questioning obvious realities, it is disinformation that is introduced as, or is probably going to be, news [11]. In contrast to different sorts of data, news assumes a key job inequitable social order. It is a key wellspring of exact data about political and cultural issues, which educates general feeling making and deliberative procedures. If the news is "fake", it deceives people in general, and popularity-based discussion is contaminated at the source. There are differing opinions when it comes to identifying types of false information [12]. However, when it comes to evaluating content online, there are various types of false or misleading news, that a person needs to be aware of. These include:

- Clickbait
- Propaganda
- Satire / Parody
- Sloppy Journalism
- Misleading Headings
- Biased / Slanted News

Twitter can be considered as one of the contemporary and famous online interpersonal organisations [13]. As a small-scale blogging framework, it is important in both private and open correspondence circles. Twitter is utilised for purposes, for example, refreshing status, starting discussions, underwriting tweet content, advancing items, and in any event,

for spamming. Furthermore, PR groups and advertisers can utilise Twitter to expand their brands and satisfy their audience. More than 80% of the population who uses Twitter are below 50 years old. 44% of 18 to 24-year-olds use Twitter. 31% of 25 to 30-year-olds use Twitter. 26% of 30 to 49-year-olds use Twitter. 17% of 50 to 64-year-olds use Twitter [14].

Twitter presently turns into the most significant social stage that serves news sources, a newsfeed for proclamations of individuals and a lot more things [15]. Individuals can follow anyone's record, and they can follow individuals to peruse, answer and to impart individual's tweets to their devotees. They can utilise Twitter for showcasing reason and some extraordinary things like:

- Advertisers can introduce their image on Twitter and can clarify the full story of items among their adherents.
- Utilise the image name in the spot of username and brand picture or logo as profile photograph.
- Complete profile and give all the highlights identified with item. By filling these subtleties, can tell their adherents what their identity is and what their administrations are.
- Attempt to expand the number of devotees by following one's colleagues, providers, temporary workers, sellers, and rivals. This will assist with knowing about them, and they will get adherents along these lines.
- Individuals can tweet, retweet, direct message to their adherents with a connect to their site or websites that force their items.
- Add recordings identified with anyone's item in their Twitter course of events with their post.
- One can take preferences from hashtags. It will help individuals to discover them and their business without any problem.

Twitter has been utilised to bring issues into light for political subjects, spread political messages and organise aggregate activities [16]. This has frequently come through explicit battles, for example, #blacklivesmatter (challenging individuals of colour). However, Twitter is additionally used to measure general conclusion, regularly creating a misguided feeling of agreement or what number of individuals feel strongly about a point (supposed Twitter storms). This is because clients will engage in general interface with individuals who hold comparative perspectives to their own and are more averse to go over various issues and conclusions. On this, by giving lawmakers customised profiles like those of different celebrated individuals, Twitter has helped transform them into big names as opposed to community workers. Twitter information opens new skylines for researchers, both as a rich information source in its privilege, yet additionally as a method of social occasion data from general society. This has the additional advantage of expanding their attention to and support in science. Twitter information social event can be latent (catching tweets that are now distributed) or dynamic (requesting that individuals partake in an extend and send in data). Twitter has opened a two-path correspondence among organisations and their clients. From one perspective, this implies it is simpler for clients to grumble to an organisation - and do so openly. However, at the

same time, it is a lot faster and simpler for organisations to answer and possibly resolve an issue and can conceivably even lessen client assistance costs. For instance, in 2010, Xbox set a Guinness World Record for being the "most responsive brand on Twitter" in the wake of replying more than 5,000 enquiries per day. This makes an imperative sign that an organisation thinks about its clients, thus expands trust in the brand. Albeit, exclusive standards can likewise prompt frustration. The movement of information around the world is not only basically obliged by the Associated Press; it is being tweeted too. Twitter has more than 300 million customers, and each time a story breaks, someone is there to post it, where it is partaken instantly. For example, the essential report of the assault which killed Osama Bin Laden in Pakistan came not from an official source, but from a local IT master. There are many intentions to post fake news on Twitter [17]. Some of them include

- Sending exceptionally large volume of replies, mentions, or Direct messages which are not asked for to compromise other's Twitter activities.
- Posting Tweets or sending Direct Messages repeatedly, which consists of links that are shared with no comments to compromise other's Twitter activities.
- Following or unfollowing number of various accounts in a short period and duplicating other's account followers to increase the followers count.
- Manipulating a conversation with the use of trending or popular hashtags and tweeting with unnecessary, irrelevant hashtags over single or numerous tweets.
- Posting ambiguous links and publishing malicious content which is intended to disturb another person's browser such as malware, compromising one's privacy.



**Fig. 1 Fake Twitter account Profile [18]**

People with all above intensions are the ones who are posting fake posts on Twitter. There are many types of scams a person or people intend to do by posting fake news on Twitter [19]. Some of them are Money Scam, BOT Spam, Paying for followers' scam, Worms, and Illegitimate DMS. The Money Scam attract users to make money easily from home just by tweeting other people's products. First, the users must pay a small sign-up fee. However, there will be some hidden charges which are not visible to the users until their first transaction. This way, people are scammed for their money. For BOT Spam scammers do not always involve directly; instead, they use bots to impersonate humans and interact with the targets. For example, when a user decides to buy something on Twitter, a

bot follows the script and offers the users the item for free. When the user visits the link, it asks to provide the user's contact and credit card information. This leaves the user defenseless against data fraud and credit card extortion. Paying for followers' scam is identical to selling email addresses to advertisers. If any user does this, they will be accused of helping in the distribution of spam messages. Twitter will ban such users. While relatively less normal than different kinds of tricks clarified above, worms despite everything represent a genuine danger to Twitter clients. In one of the most natural cases, the Mikeyy worm utilised JavaScript to in a flash taint clients' records when they visited the profiles of contaminated companions, associates, or others in their systems. By then, any individual who visited that client's profile would get contaminated. The client additionally would have started tweeting out messages containing an abbreviated connection that, whenever clicked, would have diverted clients to a site where they would get contaminated. The Mikeyy worm was a difficult issue in 2009. From that point forward, Twitter worms have been rare. However, an XSS-based assault worm succeeded in contaminating a huge number of clients in 2014. Illegitimate DMS (Direct Message Phishing Scam), using DM users can send a direct message to people without broadcasting to the entire twitter community. These are private conversations between people. The scammers send a link that is attractive to users, when users enter their login credentials within the illegitimate page, their account information is immediately forged, their followers scanned, and now similar messages are then sent to each follower.

### B. Types of media used in the spread of fake news

Tweets can be of various types like text, photos, videos, slide shares, news summaries, or links. Media like videos, images, GIFs can be included in tweets and cards. Photos can be promoted on Twitter, and videos are used as pre-roll assets. There is a limit to the length of the texts on Twitter [20]. The texts were initially to 140 characters for managing the sharing of replies, retweets, and mentions. This has now been increased to 280 characters. There are about 92% of retweets found on twitter due to some interesting content [21]. An important text retweet occurs with the inspiring quotes, lifestyle tips and interesting facts. Twitter has short text with short hints, and this has become popular. Some people focused on images than reading full-text posts. However, most of the people focus on full texts as they rely on the content stated by the participants or followers.

The text description will increase the user experience for people who could not view the full tweets. Braille devices and automated screen readers are used for translating texts, and images seem to be problematic. Tweets with photos do not view as visual on the Twitter feed of followers. To acquire audience attention, people may use photos with white space as a background. A saturated colour image helps to be more creative against the white background. It helps to increase the image posts, and related text helps to share a quick story. Many Tweets contain images which are nearly 17.2% according to a study [20]. Since the tweets with images are more likely to be shared than tweets without images, the users tend to use images along with their messages in their posts. Images on Twitter include memes, graphs, charts, screenshots. Images with texts are more

effective than only images or plain text. People often tweet images for posts that are too long to read or add images which will help the audience understand much better. Videos are used more than images and plain texts. In order to avoid misinformation, people look at the videos. People generally use MOV and MP4 video layouts and upload videos up to 512MB [22].

Other than the texts and images, people prefer videos and GIFs on Twitter. Videos are six times likely to be retweeted than photos and three times higher than GIFs. On Twitter, video content is likely to be retweeted than photos and GIFs. According to previous statistics from Twitter, it is shown that photos produce 313% than those [23]. So, people posting something on Twitter to create the most response, priority list, and most reach as per overall figures. It can go like this

- Tweets with GIFs create 6x more engagement than the text updates
- Tweets with images create 3x more engagement than the text updates
- Tweets with video create 9x more engagement than the text updates [24]

By increasing tweet frequency, communication can be improved on Twitter. People need to tweet two to three times a day. Based on the frequency, the audience size becomes equals to 30% of the follower base. This fact represents that tweet consistency is the best factor for increasing organic reach on twitter. The campaign is the key factor to increase Twitter followers, and it seems to be an attractive way to get target audience following us.

Based on the research done by Twitter on tweet engagement, only the retweets are increased up to 35% when the images are added in Twitter posts. In addition to this, Sot renders conducted the study on 500 most followed profiles on Twitter and found the same results as well. Post with Twitter link and photo had 141% retweets, and 165% likes [25]. The feature of photo review in the timeline for the posts with photos has made a more involvement of account followers.

One of the significant examples of misleading images to propagate the fake news has found during the 2016 US Election. Russian trolls played an important role during the US election 2016 by posting tweets. These images were directly doubting Hillary Clinton's credibility, honesty, and eligibility to be qualified for the president of USA and favoring Donald Trump over her.



Fig. 2 Examples of politically accused images posted by Russian trolls.[26]

Visual misinformation includes videos that appear to be real but are just a manipulation using editing tools and algorithms. One such tool "kompromat" (compromising material) in Russian was used during the US presidential election. The main target here is to create confusion. National security officials said hackers got into the Gmail account and gained personal information of Hilary Clinton's campaign and then released damaging information about her. There were many morphed images released to put the opponent down [21].

Some creators edit celebrities and make pornographic videos and making them believable for the audience. However, most of the misinformation can be spread by reusing the old pictures and videos and representing them as evidence of recent events [22].

According to a research about vaccine image tweets during the time of epidemics, most of them had a single image in it which made the article more likely to be shared (30.70% of image tweets were retweeted) than their text-only counterparts (15.30%). It was found that general images were 2.5 times more tweeted than images of the vaccine. Most of them were not created by users themselves and were just infographics or other imagery [20].

### C. Role of Twitter during elections

In the last two decades, there are various sources of information that people rely on during elections. For example, the major sources were radio, television, newspapers. Now with the growth of the Internet, users using online social networking apps like Facebook, Twitter, WhatsApp and Instagram. In less than a decade, social media has emerged as a core feature of a political campaign [29]. The users use social media as a platform to express their feelings, emotions and thoughts due to which candidates all around the world now devote significant determination in creating and maintaining social media profiles and sending promoting messages during electoral campaign periods [30].

Twitter plays an important role in politics, and during the election period that has been noticeable with the example of President Barack Obama, who conquered his opponents in terms of popularity and output. President Donald Trump also used Twitter during the 2016 US Presidential elections campaign [31]. Twitter is one of the most generally used social media platforms for party candidates, with high dissemination rates in political structures all around the world and is used in polling wars in different nations like USA, UK, Italy, Australia, and many more. During the recently held elections in the United Kingdom [UK], one can see the level of Twitter activity with vote outcomes. MPs who used Twitter had more vote shares, approximately 7-9% higher than the individuals who did not [30].

With the availability of Twitter, now voters have access to a wide range of information during elections. However, it is not at all clear that they are accessing quality information when they come to decide how to vote [32]. Concerns have increased from the most recent 2016 US presidential election because fake news developed in abundance with noteworthy speediness and spread widely since this election. Several users trust that fake news has created an influential power in the online environment which impacts the vote outcome. The term fake news generally

refers to fabricated information that disseminates deceptive content [33]. False or misleading information can be spread on Twitter like text, photos, videos or links to other websites. Innovation specialists caution about the upcoming age of fake news, called "deep fakes," which uses Artificial Intelligence (AI) to modify audio and visual files digitally. At the University of Washington, scientists effectively fabricated a program. They converted sound recordings into genuine-looking visuals presenting people like world pioneers saying something that they have never commented [6] to look like a real video shared on social media platforms in order to influence public opinion. World Economic Forum calls misinformation which is spreading on Social Networking Sites (SNSs) as a major technical and geopolitical risk in its 2013 report [33]. Fake news facilitated by both bots, i.e. automated accounts, and human users were the source for the advancement of misinformation that targeted significant users through responses. This increased the concerns of whether such misinformation movements could modify public opinion and compromise integrity during the 2016 presidential election in the United States [34]. Some made-up news stories like the Roman Catholic leader Pope Francis supporting the candidature of Donald Trump and the counterfeit scheme that presidential candidate Hilary Clinton operated an underground child sex ring in Washington [34] could affect the vote outcome.

With the increasing role of Social Networking Sites (SNSs) for news consumption, the Russian propaganda exertion delivered and published false news during the 2016 US presidential election campaign. In the last three months of campaigning, more fake news stories got generated. This resulted in more shares, reactions, and comments compared to real news stories by some political elites to legitimize fake news stories by sending them to their supporters [35] who are using SNSs like Twitter where unbelievable headlines are easier to find. This created confusion in citizens in believing news which is real or fake.

The relation between phony news audience and real news audience can be analysed by using online audience data which comes from web analytic industry like comScore. The analysis from October through November of 2016 suggested that, even the most largely disseminated fake news stories were perceived by a minimum portion of Americans by looking at real and fake news consumption [35].
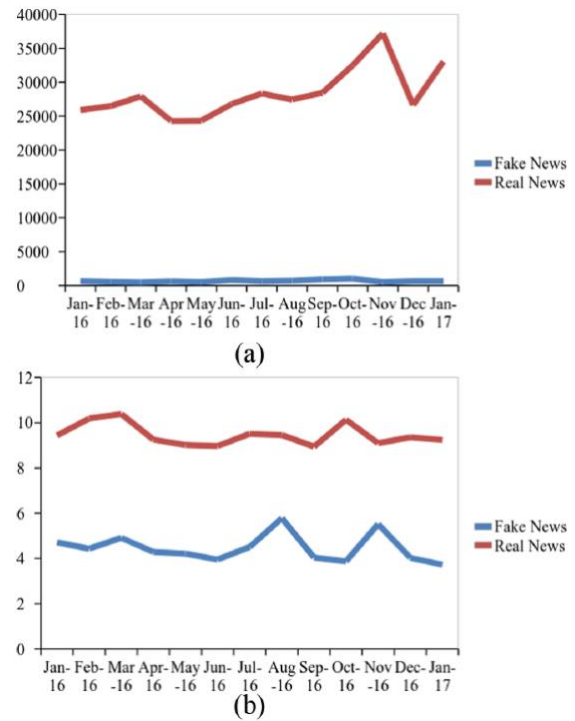


Fig. 3 a) Audience size of real and fake news sites from January 2016 to January 2017;
(b) Engagement with real and fake news from January 2016 to January 2017 measured by average minutes per visitor. [35]

Fig. 3 referred to a list of fake news outlets compiled by Open-Sources categorises the sites using tags like "fake," "satire," "hate," and "clickbait" [35]. Fig. 3 suggests that the number of online visitors every month to a typical real news site was 40 times larger than fake news sites during the entire year 2016.

On examining the Twitter accounts in the United States, it is observed that only about 0.1% were accountable for almost 80% of shares of content from fake news sites and also observed that only about 1% of the Twitter accounts inspected used up about 80% of the volume from fake news sites [34]. Fake news audiences, however small, are widely involved with the fake news they come across so, they can affect other audiences. Second-hand disinformation also occurs as people relying more on their SNSs for their information. That is how fake news audiences can impact the opinions and beliefs of other news audiences and therefore it is necessary to understand the behaviour of the audience.

Audiences with higher accessibility for mass media are more expected to have additional media content and have more time to devote to discovering a wide variety of media contents. In contrast, those with low accessibility (i.e. light media users) use their more restricted time to see the widespread content.

In addition to audience availability, other characteristics that enhance the chance that audiences will be more visible to widespread content is content popularity. It plays a vital role by algorithmic recommendations which increase inequality by growing exposure to what is already widespread. Due to this, a piece of sensational news from a popular news media that previously had millions of followers (e.g. CNN) is probable to get audiences more regularly than from an unbranded news site.

Studies also suggest that cognitive processes make people more under the influence of fake news and lack of logical thinking. Men and whites had a slightly higher chance of exposures to fake news sources because they send more tweets [36].

Also, there is a constructive association between social media use and vote results. Candidates who use Twitter have increased their chance of winning because it is likely that the use of Twitter provides direct communication between the political candidate and people who are eligible to vote. After all, voters can see messages posted by political candidates or because their network circle shares messages forwarded by the candidates. When voters come across such posts, they are well-versed about the importance of the forthcoming election, characteristics of the candidate might help sway their vote, by observing the number of friends or supporters a candidate might increase the chance of winning. Political candidates from newly formed parties or small parties will have more advantages from campaigning on Twitter because of the low cost of communication on the Twitter platforms when compared with most well-known political candidates who direct traditional media channels [30].

### D. Role of Twitter during epidemics

During an epidemic or in case of emergency, there are various sources of information that people rely on. The information source varies from radio, television to social media and random people who are active users of the social networks, and there is enough access to information to the people during times of emergency. The users of social media use it as a platform to express their feelings, emotions and thoughts [37] due to which if they come across any news on any other platform, they tend to share it to users they care about or are concerned about.

For example, in the past traditional mass media was a popular source of information during the SARS [38]. During the Ebola and H1N1 outbreak the respondents cited the internet was their most frequently used source of information on the pandemic [39]; During the COVID-19, in the lockdown people are using social media platforms to gain information about it [37]. Hence, in recent times people use the internet to get live updates about any situation happening around the world. According to the survey conducted by PEW Research Centre in 2014, 74% of Internet users use online social networking services like Facebook, Twitter, WhatsApp and Instagram [40]. In the United States, Facebook remains the most popular site, while Twitter's popularity grew from 16% to 23% in 2014. Thirty-six percentage of Twitter users checked the site daily, 24% weekly and 40% checked less than that [41].

Over 85% of the trending topics on Twitter are news. It is found that Twitter proved very useful in emergency and time of disasters [42]. Most of the internet users rely on popular news sources, regardless of ideology, while a few heavy users rely on ideologically extreme sources in addition to popular content [42]. From research done about the trustworthiness of news organisations, the researchers found that if the organisation is trustworthy, people are more engaged in their news than the others and the number of tweets has a negative impact on the

user engagement [43]. A news organisation to be trustworthy must increase their followers than to increase the number of platforms they interact on. This justifies that people often believe the source or the accounts they have blind faith on and will pass on the messages to their peers without even having to think about it.

Twitter users in the US are younger and have more education and better income than average adults in the US [53]. According to a research for security purpose, for the behaviors of the users during a crisis or emergency, the researcher separated users into three categories, as shown in Fig. 4. He found that the popular post threads were considered more for security events as they grew or spread fast in the first two hours immediately after the articles were created [44]. Also, the audiences are more likely to be influenced by the posts if they are seen repeatedly on Twitter and will be easily believable. The attackers who post disinformation on purpose will use the mutual experience to customise the posts and make it more attractive to the target audience, and the victims will never know they were a part of any fake news chain.
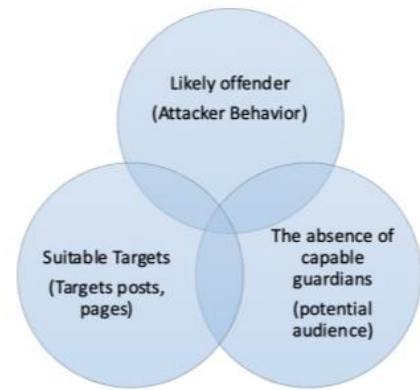


**Fig. 4 Types of users on Twitter [44]**

The targets are the people whom the post is meant for; the likely offender is the one who wants to spread the fake news, and the absence of guardians are people who have no or poor knowledge about the posts and are the ones who can be the potential audience for the fake news.

During the time of Ebola majority participants for a research reported that they trusted sources which said game meat transmitted Ebola. Also, text messages during Ebola were sent initially by the telephone companies to the subscribers, and most of them (thirty-four of thirty-seven) forwarded them to friends straightaway [45]. Very few users were really bothered to know if the information is real. These were the users that are socially aware and know the consequences if the news that he/she forwarded was false. These are mostly young generations than older people.

A research done using the Twitter search engine by finding tweets that had terms "Ebola" and "prevention" or "cure" were found and were grouped as medically correct information, medical misinformation and other. The result was more tweets and retweets contained misinformation [46]. Fig. 4 below shows the findings of the analysis, which says the tweets and retweets were more in medical misinformation than the correct

information and others



| Types of tweets and potential readers (n) | | | |
| --- | --- | --- | --- |
| | Medically correct information | Medical misinformation | Other (including tweets of a spiritual nature) |
| Tweets (%) | 203 (36) | 313 (55.5) | 48 (8.5) |
| Potential readers | 5 596 153 | 15 039 097 | 48 308 |
| Retweets* | 95 | 146 | 7 |

*$\chi^2$ test, P<0.001.

**Fig. 5 Type of tweets during Ebola [47]**

Even though Twitter was not as famous back then, but the majority of the posts were misinformation only. The reason could be the lack of medical knowledge which lead the users back then to post what they saw or heard. Also, they had no idea about the prevention or cure about Ebola.

Another research was done to find the top 10 rumors about Ebola between 28th September to 18th October 2014. The researchers used Ebola as the keyword and even used some hashtags #ebola, #EbolaVirus, #EbolaOutbreak, #EbolaWatch, #EbolaEthics, #Ebola-Chat, #nursesfightebola, #ebolafacts, #StopEbola and #FightingEbola [47]. They then created a word cloud and found the below more frequent labels.



| Table 1. Top 10 Ebola-related rumors by Tweet volume from 28 September to 18 October 2014. | | |
| --- | --- | --- |
| Rumor no. | Content | Label |
| 1 | Ebola vaccine only works on white people | White |
| 2 | Ebola patients have risen from the dead | Zombie |
| 3 | Ebola could be airborne in some cases | Airborne |
| 4 | Health officials might inject Ebola patients with lethal substances | Inject |
| 5 | There will be no 2016 election and complete anarchy | Vote |
| 6 | The US government owns a patent on the Ebola virus | Patent |
| 7 | Terrorists will purposely contract Ebola and spread it around | Terrorist |
| 8 | The new iPhone 6 is infecting people with Ebola | iPhone |
| 9 | There is a suspected Ebola case in Kansas City | Kansas |
| 10 | Ebola has been detected in hair extensions | Hair |

**Fig. 6 Ebola rumours on Twitter [47]**

The rumours kept changing from time to time as and when people heard about its causes. Hence, the rumours about Ebola went from vaccine working only on White people (Americans) to health officials injecting them and also it was detected in hair extensions.

Scientists have been concerned that the internet users receive misinformation and false rumours during crises infecting others with wrong tweets and causing havoc. The newspaper accounts on Twitter use the traditional solution of consulting public health practitioners [48]. This tells that mostly the people with less information tend to spread wrong information unintentionally.

During COVID-19, the Chinese citizens did not get any facts about it and hence depended on social media and also widely shared the images, videos of what they were going through or what they came across on the social media without finding the source or the time it happened. For example, a user shared a video saying 'Spotted a case at the airport' with a hashtag Wuhan outbreak without any details of when it was shot or if she was the person who shot it [49]. The image of the same is given below in Fig. 6, which shows the lack of crucial information. Lack of crucial information like the date and time it actually happened and source of the video, can be a major reason for people to believe and easier for intentional users to

spread panic. Many such videos were released by Chinese users showing the condition around them at the time of COVID-19.



**Fig. 7 Example of lack of crucial information during COVID-19 [49]**

During this chaos, misinformation has flourished. Articles were being circulated, which said, rinsing the mouth with saltwater could counter the virus which was not anywhere mentioned by the health experts [49].

In some countries, posts on Twitter led to buying crisis, where people tried to buy toilet paper due to the fear spreading about COVID-19. There was a video from Australia of people fighting over the last rolls of toilet paper in the shopping centre. This video was posted on March 8 and reached 77,000 views and was shared more than 400 times and had almost 500 likes in a few days and got many comments [50]. The video led to panic buying of items that were not limited to toilet paper; people stocked the essentials and left the shelves empty, and the needy were the ones who suffered. As a control measure to keep the balance, the quantity of some items a person could buy was restricted. Even though the video was not fake, but it impacted more people than expected, leading to crowds at the supermarket.

The misinformation can be a mistake, and the intentions of the posts are not to mislead people. Nevertheless, disinformation campaigns are created, usually, for political gains by politicians, activists or state actors, party operatives deliberately spread fake news or even create news that is fake. For example, a video of the Chinese government executing residents in Wuhan post COVID-19 breakout [51]. This was disinformation and was uploaded only to mislead the audiences. Also, according to a European Union document, Russian media created a "significant disinformation campaign" about the COVID-19 in order to create panic in Western countries [36]. The EU database has nearly 80 cases of disinformation about the COVID-19 starting from January 22. This was mentioned while addressing the accusations from Iran that the coronavirus is a US biological weapon [52].

Less population uses Twitter, but those who use can very easily send the news on any other platform by sharing the link. This can further increase the chain of the spread of fake news which would then be difficult to stop. So, the user accounts need to be verified, and only those could post during these times should be implemented by Twitter and the other social networks.

## IV. DISCUSSION

From the findings acquired, social media is the platform where most of the people acquire the information. The main reason (when taken a survey) is "convenience". Most people find it easy to read the news on social media than a hard copy newspaper. The social media platform is accessible everywhere and anytime. Among the social media software's, Twitter is one of the top platforms where people access information. Large number of people in the United States strongly believe that news posted on the internet is not accurate. People who use social media to read the news found it to be easier to understand. However, there are merits as well as demerits. Twitter has bots which is one of the reasons why fake news is being spread. Bots usually spread the news the same one or the related one, thus increasing in the number of viewers and belief towards it strongly increases. Fake news on twitter is posted through different techniques and with different purposes.

Depending on the purpose and the objective of the goal, a suitable technique is used. Twitter is mostly used by people from age 18 to 24. With increasing age, the number of people using Twitter are decreasing. Twitter is a platform where 87% of the people accounts are public, so anyone can see their posts at any time. The user can take advantage of utilising this platform to spread individual beliefs and even gain attention by advertising about themselves to the world. Twitter can be used by a company to make themselves seen by investors by posting any achievement. Twitter is a platform where there are many advantages. Spreading of fake news in order to get more retweets and thus the number of people who view this will increase by 30% or increasing the number of followers. Spams on twitter is a common thing where they fool the client in order to steal money without client knowledge and sometimes impersonate person.

People with more accessibility expect news from different sources, i.e., more chance to see ambiguous news sites which pop up in news feeds that initiate social media users to create more fake news sites in relation to their accessibility. So, to encounter this unrestrained publishing of fake news, political fact-checking developed as a new practice and the hard work of various fact-checkers such as PolitiFact, The AP Fact Check, and FactCheck.org to find the precision of political postulates. Fact-checkers utilises message straightforwardness and stress on facts. Both suggest elements of accurate data so, fact-checkers can validate which news can be reliable and which news is incorrect, thereby advising people to make proper choices. It might be an effective way of responding to misinformation.

In India, the government has asked top social media companies like Facebook, Twitter, YouTube to stop publishing misinformation as it creates panic among people. These companies have recently taken efforts to take down misinformation. As the work has shifted to remote computers, many firms are using artificial intelligence to monitor the misinformation instead of a human who would have been more effective to find the source. There are various examples from the history where social media has played a major role in changing the result of elections. Taking into President Barack Obama political campaign to President Donald Trump campaign, Social media and especially twitter were used to increase their popularity and win the elections. There are very a smaller number of fake accounts on Twitter, but the effect which those accounts cost is in large quantities. In almost every scenario where fake news affected the world, these few accounts were involved.

## V. CONCLUSION

Twitter is a social media platform for anything and everything from celebrity news to world news. There is worldwide concern over fake news as it can influence political, economic, and health-related information, from Government to individual. This paper analysed the tendency of people to examine and respond to the spread of fake news during election and epidemics, and it is inferred that during this period, fake news spreads more than the normal period. The fake news spreads due to the ignorance, and short of technical awareness about the news which is depicted against the actual information.

The wider reach for images than plain text makes it more susceptible kind of media for the spread of fake news. Internet skills, photo-editing experience, social media use and the attitude of an individual can lead to understanding the authenticity of the news, whether it is fake or real.

## VI. APPENDIX ONE

**Table I: Teammate weightings.**

| Participant | Weighting |
| --- | --- |
| Jaideep | 1.0 |
| Pooja | 1.1 |
| Ronak | 1.0 |
| Sandhya | 1.0 |
| Vamsi | 0.8 |
| Yaseswini | 1.1 |
| Total | 6 |

Though we struggled at the beginning of the semester to discuss the assignments because of the COVID-19 situation, in the end, we were able to finish it as a group. Every one of us contributed to writing the paper. Four members of the group (Vamsi, Ronak, Sandhya and Pooja) wrote one of the four research questions. Yaseswini wrote the beginning parts of the paper and conclusion. Jaideep wrote the discussion part as well as collecting and formatting the paper. There is a difference in the weightings because of the extra work put in by Yaseswini, Pooja in editing the paper; providing suggestions and help to other members when needed and for organising the meetings to discuss the writing of the paper. Since the total must sum up to 6, and in order to provide extra weightings for Yaseswini and Pooja, Vamsi misses out on his share as he missed a couple of discussions.

## VII. APPENDIX TWO

We got feedback from two groups. Both groups commented on not having proper formatting, proper referencing and citation numbers being jumbled. The draft was not proofread much as it was only an outline and there would be many changes later on when writing the main paper. The formatting issues mentioned

in the comments has been addressed as much as possible. Some comments were related to missing sections or no information in a section and some incomplete answers to the research question. Not much was put in the discussion and conclusion part in the draft. At the time of submitting the draft, the paper was in its very early stage of development, and there was not enough that could be mentioned in the discussion. There were comments from both the groups mentioning that the content is deviating from focusing on Twitter. We have addressed this part to the best of our knowledge. One of the comments was too much use of the word 'we'. This has been addressed as much as possible, to provide a scholarly tone. One of the comments mentioned not discussing Facebook in the paper. This has been partially addressed by adding more information regarding why Twitter is the primary focus of our paper and not Facebook.

## VIII. REFERENCES

[1]     E. Fischer and A. R. Reuber, "Social interaction via new social media: (How) can interactions on Twitter affect effectual thinking and behavior?," *Journal of Business Venturing,* vol. 26, no. 1, pp. 1-18, 2011, doi: 10.1016/j.jbusvent.2010.09.002.

[2]     A. Ju, S. H. Jeong, and H. I. Chyi, "Will Social Media Save Newspapers?: Examining the effectiveness of Facebook and Twitter as news platforms," *Journalism Practice,* vol. 8, no. 1, pp. 1-17, 2014, doi: 10.1080/17512786.2013.794022.

[3]     D. M. J. Lazer *et al.*, "The science of fake news," *Science (New York, N.Y.),* vol. 359, no. 6380, p. 1094, 2018, doi: 10.1126/science.aao2998.

[4]     C. Forsey, "Twitter, Facebook, or Instagram? Which Platform(s) You Should Be On," Hubspot, 8 March 2020. [Online]. Available: https://blog.hubspot.com/marketing/twitter-vs-facebook. [Accessed 14 June 2020].

[5]     E. Shearer and K. E. Matsa, "News Use Across Social Media Platforms 2018," Pew Research Center, 10 September 2010. [Online]. Available: https://www.journalism.org/2018/09/10/news-use-across-social-media-platforms-2018/. [Accessed 14 June 2020].

[6]     A. Hughes and S. Wojcik, "10 facts about Americans and Twitter," Pew Research Center, 2 August 2019. [Online]. Available: https://www.pewresearch.org/fact-tank/2019/08/02/10-facts-about-americans-and-twitter/. [Accessed 14 June 2020].

[7]     A. Rudat and J. Buder, "Making retweeting social: The influence of content and context information on sharing news in Twitter," *Computers in Human Behavior,* vol. 46, pp. 75-84, 2015, doi: 10.1016/j.chb.2015.01.005.

[8]     C. Shao, G. Ciampaglia, O. Varol, Y. Kai-Cheng, A. Flammini, and F. Menczer, "The spread of low-credibility content by social bots," *Nature Communications,* vol. 9, no. 1, pp. 1-9, 2018, doi: 10.1038/s41467-018-06930-7.

[9]     S. Wang, "Twitter Isn't Taking Fake News Seriously," *Bloomberg Businessweek,* no. 4543, p. 22, 2017.

[10]    M. J. Akshay, N. Ala Mohammed, A. Vyas, P. B. Shony, and S. K. Correa, "Information abuse in twitter and online social networks: A survey," vol. 950, ed, 2018, pp. 55-66.

[11]    Tarlach McGonagle, ''Fake news'': False fears or real concerns? Netherlands Quarterly of Human Rights 2017, Vol. 35(4) 203–209, journals.sagepub.com/home/nqh.

[12]    webwise.com, 'Explained: What is False Information (Fake News)?', 2019. [Online]. Available: https://www.webwise.ie/teachers/what-is-fake-news/

[13]    Aravind Sesagiri Raamkumar, Edie Rasmussen, Mojisola Erdt, Yin-Leng Theng, Harsha Vijayakumar, Understanding the Twitter Usage of Humanities and Social Sciences Academic Journals. [Online] Available: https://arxiv.org/ftp/arxiv/papers/1807/1807.05571.pdf

[14]    Omnicore, 'Twitter by the Numbers: Stats, Demographics & Fun Facts'. [Online] Available: https://www.omnicoreagency.com/twitter-statistics/]

[15]    Economic and Social Council, 'What is the scope of Twitter?', 2019. [Online] Available: https://esrc.ukri.org/

[16]    The Conversation, 'Six ways Twitter has changed the world', 2019. [Online] Available: https://theconversation.com/six-ways-twitter-has-changed-the-world-56234

[17]    'Platform manipulation and spam policy', 2019. [Online] Available: https://help.twitter.com/en/rules-and-policies/platform-manipulation

[18]    My "force myself to write and be creative" blog, "Fictional Twitter Profiles", 2016. [Online] Available: http://creativeedtech.weebly.com/blog/fictional-twitter-profiles.

[19]    The State of Security, 'A Guide on 5 Common Twitter Scams', 2016. [Online] Available: https://www.tripwire.com/state-of-security/security-awareness/a-guide-on-5-common-twitter-scams/

[20]    A. Hutchinson, "Images, GIFs or Video - Which Generates the Most Response on Twitter?", Social Media Today, 2016. [Online]. Available: https://www.socialmediatoday.com/social-business/images-gifs-or-video-which-generates-most-response-twitter. [Accessed: 28- May- 2020].

[21]    S. McQuate, "How people investigate — or don't — fake news on Twitter and Facebook", UW News, 2020. [Online]. Available: https://www.washington.edu/news/2020/03/18/how-people-investigate-fake-news-on-twitter-and-facebook/. [Accessed: 28- May- 2020].

[22]    TrackMaven, "How to Find the Best Twitter Hashtags, Post Type and Tweet Length", TrackMaven | The Marketing Insights Company, 2020. [Online]. Available: https://trackmaven.com/blog/best-twitter-hashtags/. [Accessed: 28- May- 2020].

[23]    O. Sarah, "Russian 'kompromat' works - whether it's true or not," ed. Washington, D.C: Washington, D.CWP Company LLC d/b/a The Washington Post, 2017.

[24]    "How to Increase Twitter Engagement by 324%", Quicksprout.com, 2019. [Online]. Available: https://www.quicksprout.com/twitter-engagement/. [Accessed: 28- May- 2020].

[25]    Lyons, "Twitter's manipulated media policy may include labels for "harmfully misleading" tweets", The Verge, 2020. [Online]. Available: https://www.theverge.com/2020/2/20/21145827/twitter-test-misinformation-politicians-tweets. [Accessed: 28- May- 2020].

[26]    Guess, A., Nyhan, B. and Reifler, J., 2018. Selective exposure to misinformation: Evidence from the consumption of fake news during the 2016 US presidential campaign. *European Research Council*, *9*(3), p.4.

[27]    S. Krishnan and M. Chen, "Identifying Tweets with Fake News," ed, 2018, pp. 460-464.

[28]    Chen and M. Dredze, "Vaccine Images on Twitter: Analysis of What Images are Shared," Journal of Medical Internet Research, vol. 20, no. 4, p. e130, 2018, doi: 10.2196/jmir.8221.

[29]    J. Bright, S. A. Hale, B. Ganesh, A. Bulovsky, H. Margetts and P. Howard, 2018. [Online]. Available: https://www.markpack.org.uk/files/2018/03/Does-Campaigning-on-Social-Media-Make-a-Difference-Evidence-from-candidate-use-of-Twitter-during-the-2015-and-2017-UK-Elections.pdf.

[30]    "MIT Technology Review," 26 October 2017. [Online]. Available: https://www.technologyreview.com/2017/10/26/148116/how-tweets-translate-into-votes/.

[31]    L.-M. Nuedert, P. Howard and B. Kollanyi, "Sourcing and Automation of Political News and Information During Three European Elections," vol. 5, no. 3, 2019, published.

[32]    A. Bovet and H. A.Makse, "Influence of fake news in Twitter during the 2016 US presidential election," Nature Communications , pp. 1-14, 2019,published.

[33]    E. C. T. Jr., "The facts of fake news: A research review," Sociology compass, vol. 13, 2019, published.

[34]    J. L. Nelson and H. Taneja, "The small disloyal fake news audience: The role of audience availability in fake news consumption," vol. 20, pp. 3720-3737, 2018, published.

[35]    N. Grinberg, K. Joseph, L. Friedland, B. Swire-Thompson and D. Lazer, "Fake news on Twitter during the 2016 U.S. presidential election," science, vol. 363, pp. 374-378, 2019, published.

[36]    M. Hameleers and T. G. L. A. v. d. Meer, "Misinformation and polarization in a High-choice media environment: How effective are political fact-checkers?," vol. 47, pp. 227-250, 2019, published.

[37]    G. Eysenbach *et al.*, "The Impact of Social Media on Panic During the COVID-19 Pandemic in Iraqi Kurdistan: Online Questionnaire

Study," *Journal of Medical Internet Research,* vol. 22, no. 5, 2020, doi: 10.2196/19556.

[38] C. Jardine, F. Boerner, A. Boyd, and S. Driedger, "The More the Better? A Comparison of the Information Sources Used by the Public during Two Infectious Disease Outbreaks: e0140028," *PLoS ONE,* vol. 10, no. 10, 2015, doi: 10.1371/journal.pone.0140028.

[39] U. o. M. BHAVTOSH RATH, USA JISU KIM, University of Minnesota, USA JISU HUH, University of Minnesota, USA JAIDEEP SRIVASTAVA, University of Minnesota, USA, "Impact of News Organizations' Trustworthiness and Social Media Activity on Audience Engagement."

[40] B. U. o. C. Kang, Santa Barbara, ProQuest Dissertations Publishing, 2016. 10103613., "Information Reliability on the Social Web Models and Applications in Intelligent User Interfaces."

[41] D. Lamb, "Identifying Nodes of Transmission in Disease Diffusion Through Social Media," J. Downs, L. Collins, S. Dodge, and S. Reader, Eds., ed: ProQuest Dissertations Publishing, 2017.

[42] S. Vosoughi, M. Mohsenvand, and D. Roy, "Rumor Gauge: Predicting the Veracity of Rumors on Twitter," *ACM Transactions on Knowledge Discovery from Data (TKDD),* vol. 11, no. 4, pp. 1-36, 2017, doi: 10.1145/3070644.

[43] B. Rath, J. Kim, J. Huh, and J. Srivastava, "Impact of News Organizations' Trustworthiness and Social Media Activity on Audience Engagement," *arXiv.org,* 2018.

[44] C.-M. Lai, "Attackers' Intention and Influence Analysis in Social Media," S. Wu, C.-J. Hsieh, and C. Shen, Eds., ed: ProQuest Dissertations Publishing, 2019.

[45] I. Ngade, M. Singer, O. Marcus, and J. Hasemann, "Implications of Changing Attitudes towards Game Meat Consumption at the Time of Ebola in Limbe, Cameroon," *Hum. Organ.,* vol. 76, no. 1, pp. 48-58, 2017.

[46] S. O. Oyeyemi, E. Gabarron, and R. Wynn, "Ebola, Twitter, and misinformation: a dangerous combination?" *BMJ (Clinical research ed.),* vol. 349, no. oct14 5, p. g6178, 2014, doi: 10.1136/bmj.g6178.

[47] J. Fang *et al.*, "Misinformation Propagation in the Age of Twitter," *Computer,* vol. 47, no. 12, pp. 90-94, 2014, doi: 10.1109/MC.2014.361.

[48] X. Zhang, B. Bie, and A. C. Billings, "Newspaper Ebola articles differ from Twitter updates," *Newspaper Research Journal,* vol. 38, no. 4, pp. 497-511, 2017, doi: 10.1177/0739532917739883.

[49] V. Daniel, "Panic and Criticism Spread on Chinese Social Media Over Coronavirus," ed. New York: New York New York Times Company, 2020.

[50] L. L. C. Translated by ContentEngine, "Coronavirus: what is the profound meaning of desperation for toilet paper?" English ed. ed. Miami: Miami ContentEngine LLC, a Florida limited liability company, 2020.

[51] S. N. Service, "BATTLING THE 'PANDEMIC OF MISINFORMATION'," ed. : States News Service, 2020.

[52] R. Emmott, "Russia deploying coronavirus disinformation to sow panic in West, EU document says," ed. Toronto: Toronto Postmedia Network Inc, 2020.