

# How to Identify Fake News on Social Media: A Systematic Literature Review

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**Abstract.** Fake news in the form of disinformation on social networks has become a real concern, with serious potential consequences as a result of the massive viral spreading of false information and fake news. To this end, a systematic literature review was performed to investigate how the validity of news on social media can be determined. An initial literature search resulted in identifying 1105 potentially relevant articles, which were taken through a systematic sifting process resulting in 25 articles that were analysed in detail. During a thematic analysis, four themes emerged, related to fake news, social media, the influence of bias and information literacy. This paper discusses the findings related to the four themes. The findings were distilled into a set of five guidelines that may be used to determine the validity of news on social media. The techniques are: consider the source; beware of bots; be aware of bias and make use of multiple sources; beware of mimics; and ways to recognise good sources of information. This paper contributes to the current discourse on how to distinguish between valid news and fake news on social media, and provides guidance to assist with this ever growing and increasingly important information management challenge.

**Keywords:** Fake News, Social Media, Online Media, Propaganda, Conspiracy, Systematic Review.

## 1 Introduction and Motivation for the Study

The news is supposed to offer the public facts and truths about the society in which they live. For decades honest reporting has been a source of pride to newspaper reporters. The internet and the advent of social media have had a big impact on how people get their news. Anybody can share news stories and articles online without regulation [1, 2]. This freedom has created an opportunity for misinformation to be spread online either intentionally or due to ignorance. Social media is now a source of news for many people. A Pew Research Centre survey found that 62% of American adults receive news from social media [2]. Although spreading false information isn't always the primary objective of the news source, some people spread fake news purposely for money in the form of ad revenue or for their own agendas. Fake news is a profitable endeavour for foreign and domestic entrepreneurs and businesses [3]. The internet is awash with misinformation, conspiracy theories and outright lies posing as news. Even when fake news is exposed or disproven the damage has been done, people will still be able to

find that information since it continues to float around the internet [4]. It is important for an individual who regularly surfs the web and gets their news from online sources to have the ability to spot fake news. In the information age the young have become accustomed to getting all their entertainment and news from online sources, students tend to use social media platforms as well as online news sites as the source of the majority of their news [2]. With the web awash with falsified information, it is important to know how to spot fake news, how to find credible sources and how to dissect news stories to see if the author has an agenda. Individuals need information literacy skills that will allow them to carefully select their sources of news and analyse the articles they see online to see if they are truthful. This literature review's aim is to discover the techniques an individual can use to analyse the validity of news they find online.

This paper is organized as follows. Since the study itself is a literature review, it proceeds directly to the research method in Section 2. In Section 3, the results or findings are presented. This is followed by a discussion in Section 4, including details on the impact of the research and recommendations on how it can be improved. The paper ends with a Conclusion in Section 5.

## 2 Research Method

### 2.1 Research Design

The research method for this study is a systematic literature review (SLR). A SLR involves searching for multiple high-quality research papers and then using those papers to answer a single research question. Previous research is thus summarised and integrated into a paper to answer the research question that was posed [5]. The purpose of this systematic literature is to answer the following research question: *Identifying fake news: How can the validity of news on social media be determined?* The ability to identify fake news, misinformation as well as disinformation on social media is fast becoming a vital skill in the modern age and this literature review will attempt to provide some insights on how fake news on social media can be identify. The following search terms were used: (“identifying fake news” OR “Spotting fake news” AND “fake news” OR “Misinformation”.); (“identifying fake information” OR “Spotting fake information” AND “fake news” OR “Misinformation”.) A search for scholarly articles was performed. The inclusion criteria of the documents selected were as follows: the article must be in (i) English, (ii) full text, (iii) published in the range of 2000 and June 2021 and (iv) peer reviewed. In terms of source selection, the following databases of the University of Pretoria online library were consulted: Taylor & Francis e-journals; ScienceDirect Journals Freedom Collection, Elsevier, MEDLINE/Pubmed, ERIC, Wiley, Buffalo.edu, IEEE and CrossRef.

### 2.2 PRISMA Flowchart

A PRISMA flowchart was used for article filtration. Using the search terms, an initial list of 1105 articles was created. These were reviewed to identify and remove

duplicates. Twenty-three duplicates were found and removed, leaving 1082 articles. The next step was to review the abstracts and filter out articles that were of no use (using relevance to the research question as criterion). This step resulted in the removal of 1036 articles leaving 46 articles. The remaining articles were read in full and those deemed to be useful were filtered from the remaining articles (using the Quality Assessment criteria supplied in 2.3 as evaluation measure). In the end 21 articles were removed from the remaining 46 articles leaving 25 articles to be used in the literature review.

### **2.3 Quality Assessment**

To gauge the quality of the articles gathered, a quality assessment was performed. The evaluation entailed answering the following quality assessment questions:

QA1: Does the article convey the dangers of fake news and the techniques one could use to combat it?

QA2: Does the article detail the biases one needs to be aware of when analysing fake news?

QA3: Does the article reach conclusions based on the evidence provided or are the conclusion and/or findings related to the information discussed in the article?

QA4: Does the article contain proper references and are those references from varied credible sources?

### **2.4 Data Extraction**

A thematic analysis was done on the 25 articles. As part of the analysis, quotes were taken from the articles and each quote was coded. The codes represented the theme or mood that was extracted from the quote. Once the theme was coded the quote's theme and subtheme were also extracted. The quote, code, subtheme, and main theme were kept in a table. Once the thematic analysis was completed the result was a list of quotes along with their codes, theme, and subthemes. The thematic analysis data was then used to assist in the completion of the data extraction table. The data extraction table has a Citation, Name of Journal / Conference, Code/s, Main Theme/s, and Notes heading.

## **3 Results**

To conduct a high-quality literature review, one must have good quality articles. In this section the chosen articles are evaluated for quality. The meta-data, information and patterns found in the articles were recorded to offer insights into the types of articles that were chosen for the literature review.

### **3.1 Quality Assessment Results**

Each of the 25 papers were assessed on the four Quality Assessment (QA) questions presented in Section 2.3 above. For each QA question, tangible assessment criteria were

set. For example, for QA4, the assessment criterion was: The article has a minimum of 8 references from diverse and credible sources (credible sources are peer reviewed articles as well as published books). The quality assessment of the articles resulted in each article receiving a score of 1, 0.5 or 0 for each QA question, depending on whether the article met the QA criterion fully, partially or not at all. During the scoring, nine out of the 25 articles scored 3 or more points, and five of the 25 articles scored 2 or less points. Hence the majority of the papers chosen were of above average or good quality.

### 3.2 Descriptive Analysis

A descriptive analysis was conducted for the 25 articles, considering the year of publication, country, and database where it was published. Concerning the year of publication, all articles were published in the period 2017-2021, even though the search was done for articles since 2000. The years with the most publications were 2019 (7 articles) and 2020 (8 articles). The countries where the articles were written, were as follows: USA (11), Australia (3), UK (2), Italy (2), and one article each from Canada, Spain, Brazil, Ireland, Turkey, Portugal, and Pakistan. The majority of the chosen articles were found on the ScienceDirect database (7), followed by Taylor and Francis Journals (5) and Elsevier (4), MEDLINE/Pubmed (3), ERIC (2), and one article each from Wiley, Buffalo.edu, IEEE and CrossRef.

## 4 Discussion

This section discusses the findings of the systematic literature review. Four main themes were found in the thematic analysis, namely fake news, social media, the influence of bias, and information literacy. The section also discusses five guidelines a social media user can take to determine the validity of news on social media. These guidelines are derived from the information discussed in the four main themes.

### 4.1 Fake News

**What is fake news?** Fake news has many definitions, but broadly it can be described as false information, that for a multitude of reasons ranging from ignorance to a conscious decision to mislead, is shared as fact. Fake news exists in three forms, fraudulently information created specifically to deceive, rumours which are often unverified and come from dubious sources, and humour which may employ sarcasm as well as irony to create parodies or satire [6]. Fake news can have benign origins. Fake news may begin as a parody or satire that is misunderstood by someone who then shares it as fact, transforming the parody or satire into a fake news story which many may believe to be true [2]. The most malicious use of fake news is the conscious spreading of misinformation to confuse fact and fiction. Fake news is created to mimic authentic news [7]. Fake news is by no means a new phenomenon, what has changed however is the frequency with which news is shared and received on social media. More news is being consumed online, usually through social media. Technological advances made it easier

to create fake news sites that mimic reputable news sources while also creating spaces for advertising [3].

**Fake news for financial gain.** Disseminating fake news successfully is a business and there is no shortage of parties who seek to profit from fake news. People often use fake news to attract attention to their articles so that they may profit from advertising revenue [2]. There are sites that produce fake news articles to drum up interest on certain sites, these sites are usually plastered with ads, the interests generated results in added advertisement profits for these sites [3].

**Fake news' effect on politics and ideology.** Fake news and online rumours can have real world consequences such as election manipulation or may result in protests and other forms of offline violence [8]. Consuming fake news can influence an individual's voting behaviour [3]. There seems to be evidence that fake news and disinformation were purposely spread during the 2016 USA presidential election [9]. Social media users who are exposed to fake news can be manipulated into sharing and performing actions based on disinformation [3]. Fake news can be used to influence an individual's opinions on politics and other ideological and social issues such as climate change [7].

**Fake news and the techniques used to fake credibility.** One of the main contributors of fake news is social media, since the media shared on social media platforms is unregulated and unverified and it is often difficult to find the origin of information [10]. To make themselves look more official, fake news sites try to mimic the look and style of trusted sources [9]. Malicious news sites use many tricks to convince the reader that they are on a reputable site, by mimic the look of a reputable site as well as the domain name, such as ABCnews.com.co resembling ABCnews.com to confuse the reader, making it more likely that they will share fake news, believing the news comes from a credible source [8].

**Fake news' use of public interest.** To enhance the success of fake news, fake news authors will write about stories that capture the public interest for example related to the Covid-19 pandemic [11]. Fake news authors use crises, elections and other events of public interest to enhance the success of their fake news stories. Social media users are exposed to millions of fake news articles during elections, these periods are referred to as peak exposure [12].

## 4.2 Social Media

**Who is most vulnerable to fake news on social media?** Students and young persons are more vulnerable to fake news since they get most of their news on social media [2]. A 2018 survey found that 88% of 18- to 29- year-olds report that they use social media. Similarly, an American study showed that 89% of students reported that social media was their primary source of information [9]. Research has shown that young people

have trouble discerning the truthfulness of news that's shared through social media [2]. Young people are not the only group vulnerable to fake news. A Pew Research Centre survey found that 62% of American adults receive news from social media [2].

**What is the reason for the prevalence of fake news on social media?** The unmoderated nature of social media makes it very easy to spread fake news, to many people, very quickly hence fake news has been a problem on sites like twitter [1]. Information on social media is shared in real-time and there is no real-time evaluation of posts therefore most social networks are awash with misinformation [13]. Many social media platforms earn their money through advertising and in order to earn the most it is important that users stay engaged for the longest period of time. Fake news and sensational news stories help keep users online, hence curtailing the spread of fake news will negatively affect their profit margins, which may explain the hesitancy of many social media platforms to stop harmful behaviour [12].

**The effect of fake news during a crisis.** Many fake news articles and unsubstantiated claims were shared online at beginning of the Covid-19 pandemic. Panic and fear are a breeding ground for misinformation. Fake news spreads easily on social media during crisis and disasters, times where for the sake of public safety it's vital for that credible information is shared [1]. Fake news about Covid-19 is especially dangerous because it puts the public health at risk [14].

**Bots on social media.** For those who wish to spread fake news there are many tools at their disposal. One such tool is bots. Bots are pieces of software that are designed to automate tasks [2]. Bots can be used to comment, like, and share post on social media. Social media bots are made for the purpose of amplifying the amount of information being shared, and reposted on social media, the more that information is repeated the more believable it is to people [2]. Bots sometimes mimic humans and have profiles online design to appeal to the group they wish to influence [2].

### 4.3 Influence of Bias

**Confirmation bias and its influence on the believability of fake news.** Fake news uses an individual's cognitive bias to deceive them for ideological or financial gain [15]. Confirmation bias refers to the tendency of individuals, when presented with information that aligns with their previously held beliefs, to view that information as correct and true. It is often easier to believe things that fit in with our worldview and reinforce our beliefs [2]. Confirmation bias was discovered to be the most powerful driver for believing fake news. Individuals tend to believe news that aligns with what they already believe and filter out opposing ideas deeming them to be false [15]. Hence when someone is faced with an article that agrees with them they perceive the article as good and true but when faced with an article that disagrees with them it bad and false [2].

**Bias and politics.** Human beings are tribal, and they tend to stick with their perceived kin. Where political news is concerned, individuals tend to view the news that supports the values of their political affiliations as more believable than those that support the opposition [7]. Social media enhances the third-person perception relating to fake news, this means that individuals have a self-serving bias that others are more susceptible to fake news than they are [15]. In a study it was observed that the participants possessed a self-serving bias that the members of the opposing party were more easily fooled by fake news [16]. Fake news distributors can profit from political bias, by creating eye catching news headlines that will appeal to the individuals in each political party.

**Bias and fake news.** There are other forms of bias that influence the believability of fake news on social media. The effect of confirmation bias can lead to the formation of information silos which can be referred to as “bubbles” or “chambers”. Social media makes it possible for individuals to live in “bubbles” or “chambers” where only information that aligns with the users’ world view is presented to the user [10].

**Memory bias and the long-term effects of fake news.** Memory bias influences one’s belief of fake news. Memory bias occurs because our memory systems do not automatically rectify incorrect information in our brains; rather, that incorrect information may remain available and may continue to affect the individual [15]. Even after an individual has encountered information that proves their previously held notions to be false, that false information can continue influencing the individual’s actions and beliefs.

#### 4.4 Information Literacy

Information literacy is a set of skills that allow a person to discover information, understand the methods with which the information was created and then use the knowledge gathered to participate ethically in learning communities [2]. Information literate individuals when confronted with new information may seek reliable sources to validate the new information that has been received.

Information literacy is a skill needed urgently due to the massive loads of information people consume in the modern age; it is the most important weapon available in the battle against fake news [3]. Media literacy is an individual’s ability to access and consume media, critically evaluate the media and participate in the creation of one’s [3]. Possessing critical information evaluation skills may help an individual identify fake news through the ability to critically evaluate information they find online [9].

#### 4.5 Guidelines to Determine the Validity of News on Social Media

Jahng et al. [17] proposes steps an organisation can take to minimise the damage that can be caused by fake news: 1) Be aware that fake news can harm the organization and double check information, where the author seems to have deceptive motivations, or an agenda, before engaging in trends on social media; 2) Check the validity of any viral information shared on social media by checking out the original source, and using

multiple credible and reputable sources; 3) Become knowledgeable about fact checking tools available online, and be aware of the warranting cues social media platforms use to flag deceptive information; and 4) Create relationships with experts who when needed can provide their expertise and attest to the validity of the news found online. To limit the effect of bias one should endeavour to form relationships with people outside their immediate circle. Apart from the above, the following guidelines for determine the validity of news on social media can be distilled from the thematic analysis:

- **Consider the source.** The source of the news found online and the motivations behind the story are important and must be reviewed [2]. Getting information from multiple sources, will help social media users determine the validity of online news.
- **Beware of bots.** Bots have been known to mimic humans and have profiles online design to appeal to the group they wish to influence [2]. Social media users should review and critically evaluate news that comes from users who seem to only comment, like and repost things yet make no original content of their own.
- **Be aware of bias and make use of multiple sources.** Confirmation bias and other cognitive factors may possess an influence in the believability of news found on social media [2]. To fact check information found online, one can make use of online tools such as fact checking sites.
- **Beware of mimics.** Fake news authors employ tricks to make a social media user believe they are on a legitimate news site. Fake news sources often try to mimic the look and style of trusted sources, so that they seem more legitimate and credible while they spread falsehoods [9]. Fake news sites often mimic the look of a reputable site as well as the domain name. With this in mind, social media users should double check the domain names of their news sites to ensure they are on the correct site.
- **Recognizing good sources of information.** Good sources of information are vital for determining the truthfulness of news online. Real news publishers follow the “Society of Professional Journalists’s (SPJ) Code of Ethics” which includes: “Take responsibility for the accuracy of work; Verify information before releasing it and use original sources whenever possible; Identify sources clearly - the public is entitled to as much information as possible to judge the reliability and motivations of sources.” [2]. Good news sources will be accurate and have a list of sources. Be cautious of sites with news stories that cite other news cites as their source [3].

## 5 Conclusion

To answer the research question: *Identifying fake news: How can the validity of news on social media be determined?*, a search for articles was performed on the University of Pretoria academic online library and 25 articles were identified to be used in the literature review. During a thematic analysis of the articles, four main themes emerged namely fake news, social media, influence of bias, and information literacy.

With the fake news theme, it was discovered that there are financial and/or ideological reasons for the prevalence of fake news online. In the social media theme, it was found that individuals who were often on social media were the ones in the greatest danger of being exposed to fake news. From the influence of bias theme, it was



discovered that the main force that drives the believability of fake news is confirmation bias and although combating one's internal biases may be difficult one can use fact checking tools to find unbiased information. Finally, with the information literacy theme it was found that the most important weapon that society has against fake news is information literacy, and that the critical evaluation of the news and its source can help an individual decipher fake news from real news. Overall, the key to finding out if something found online is true or not is critically evaluating the source and getting information from multiple sources. From the thematic analysis, five guidelines emerged to help determine the credibility of news on social media, namely: consider the source, beware of bots, be aware of bias and make use of multiple sources, beware of mimics, and recognizing good sources of information.

The strengths of the review include the use of several good quality articles. Although fake news and misinformation are not new topics, fake news enhanced by social media is, hence the findings of this paper reflect the current state of fake news, misinformation and disinformation on social media. One limitation of this review is the exclusion of non-English articles.

This study contributes by firstly providing a better understanding of why fake news is prevalent and what influences it to spread so easily. Further, five guidelines are distilled that may be used to determine the validity of news on social media.

Future studies may focus on how fake news enhanced by social media is a threat to democracy and what methods states, individuals and the social media platforms themselves can take to face that danger. Further research could focus on the influence that fake news has on video sharing sites such as TikTok and how to best combat this form of fake news.

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