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# Authenticating Fake News: An Empirical Study in India

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**Abstract.** Social media has become an important means for communication to promote content sharing and social networking. The usage of social media has opportunities and challenges. This article aims to highlight the ways through which individuals authenticate fake news while using social media platforms. To explore the patterns of fake news authentication on social media, online and offline surveys were conducted to get 231 responses. Social media users at the individual level authenticate fake news at two levels: internal – individual discernment and perceptiveness about news, sources and popularity of news, and external – friends and relatives, multiple external sources, formal and social spheres. This study provides insights into the usage patterns of social media platforms and ways of fake news authentication. The insights from the study might help social media platforms, governments, users and researchers.

**Keywords:** Social media; Fake news; Authentication of fake news

## 1 Introduction

The emergence of social media platforms enables the social networking of firms; individuals provide opportunities to capture the potential of social media usage. Social media enable a new mode of communication to increase social networks [1, 28]. Social media functionality impacts the following functions: sharing, presence, relationships, identity, reputation, relationships, groups and conversations [29-30]. These functions are influenced by social media activity [2]. The usage of social media platforms poses opportunities and challenges to overcome, regarding challenges, implementation is one such challenge [1] and implementation aspects of co-evolution of social media and traditional marketing [3]. Social media provide opportunities to companies and users to connect and integrate the traditionally isolated stakeholders with each other [4]. Social media platforms have the potential to influence the users and companies to influence each other [4], and social media content can be used to predict the future by analysing the sentiments of the users [5]. Social media ecosystem provides opportunities and challenges to consider while using different platforms. In this background, fake news is a critical issue to be considered by platforms, governments, users and individuals.

Fake news is a threat not only to the company or individuals but also to the whole country [6]. Fake news is a very subjective matter. People judge the news based on their belief and share it in their network. In general, fake news is fabricated news with wrong facts with a motive of deceiving or satire on someone. Social media message credibility may be influenced by any medium or delivery channel, and even the messages structure themselves [7].

There are various social media platforms available to engage people. Factors such as access to a smartphone, Internet and people interacting on social media platforms enable instant sharing of information across the world, for example, viral messages and videos. Offline news channels are moving to social media platforms to provide instant news. Social media platforms enable the news channels' content selling. Since the content flow on the Internet is free and there are limited rules and regulations available to control the content. The spread of fake news on social media platforms came into light without knowing the truth about the news, believing and sharing within their network. The shared messages are psychological, politically motivated and emotional, which influence the people who trust the content without verification. Fake news influenced the US election in 2016. People change their mind so quickly that it is very difficult to come to any conclusion. The rise in fake news makes the social media platform more powerful, which impacts government, society and individuals. Social media platforms usually do not examine the perceived credibility of social media content through its platforms [8]. With this background, this study focuses on the factors used by the users of social media platforms to authenticate social media platforms news. This article is organized as follows. Section 2 examines the literature review related to fake news and finds the gaps and section 3 presents model and research question. In section 4, the methodology is discussed. The fifth section presents the findings and discussion, and the final section is the conclusion.

## **2 Literature Review**

Social media data are huge and can be categorised into various areas. The huge data and easy penetration of data across the world. Social media data availability and accessibility raise issues related to information consumption. Information consumption and perception depend on the echo effects and credibility of the information. The existence of the echo effects where the information perception is depends on the frequency of information, which generates a positive idea about the information. The credibility of the information increases when others perceive the source of information credible [9].

The youth in the Internet era are well connected to friends and relatives. They depend on social media for news, and the websites provide various discussions and opinions about the news. The individual's motivation to seek news is driven by personal interest. The youth consider social media networking sites' discussions as more authenticating means to gather news while they also gather news from mainstream news media about the concerned issues [10]. Although there is a gap in the comprehensive coverage of the news, and the youth viewpoints provide an opportunity to the traditional media to present news from different viewpoints rather than from the single objective point of view [10].

Fake news has the potential to influence election outcomes. The voters remember one or more fake news about different political candidates. The fake news divides the opinion of the voters, which has the potential to provide a winning margin to the election candidates [6].

The opinion leaders on social media influenced the perception of users/followers on news trust. Strong opinion leaders generate strong trust for the news seekers. In some cases, information shared on social media sites is perceived as more trustworthy than from direct media outlet [11]. The existence of malicious social media accounts for spreading fake news [9]. The recognition of fake news creates an interest in the practitioners to use technologies for categorization, identification and developing solutions for future projects related to fake news.

## 2.1 Technology and fake news

There is enormous content generation on social media websites. To authenticate social media content requires a different approach than the traditional approach. The use of emerging technologies such as artificial intelligence, machine learning, and the network analysis approach enables a hybrid approach for fake news detection. Despite using the latest technologies, there is no straightforward solution to detect fake news [12].

Artificial intelligence is not only used to solve various issues but also has deployed to create social bots to spread fake news [13]. The social bots have been used to spread information, promote a campaign and promote ideologies on social media platforms. The social bots have been deployed to both promote right information and promote false information. The study on twitter data of US election revealed that social bots had played a key role in spreading fake news. Fake news can be stopped by targeting social bots [14]. With the help of computing, social bots can be recognized. Social media platforms enable the machine-human interactions; such interactions should be based on the authentication and recognition of the machine and human interactions to avoid false roles and spread of mistrust [13].

Fake news detection on social media can be categorized using data mining perspectives using algorithms to categorize the news and accounts as fake and real. The existence of malicious social media accounts for spread fake news. [9].

identification and verification of information on social media is a challenge for the journalist – the development of social sensor software to identify fake news based on the source and locations. Software development is based on the collaborations of social scientists, journalists and computer scientists [15].

Fake news can be categorised into serious fabrication, which is found in mainstream media, and which requires substantial efforts to collect them. The second category is large-scale hoaxes; these are creative, unique and source from multiple platforms, which require identification methods beyond text analytics. The third category is humorous news with large-scale data. The use of technologies such as big data, Natural Language Processing (NLP), LIS, journalism and fake news provides means to enable an environment for automatic detection of fake news [16].

In India, social media is used to propagate political ideologies by recruiting citizens. These are paid news where individuals are recruited, who do not belong to any political party to spread messages to their networks [17]. Fake news propagation leads to social unrest in India, for instance, cases of Muzaffarnagar riots and Dadri lynching mob. Fake news in political and economy fields influences social media networks, for instance, there was a news shared on social media platforms about GPS chips and radioactive ink in newly issued Rs. 2000 notes in India and support of United States' president to Indian political leader, these news were discussed in the mainstream news channel, which shows that mainstream news role in spreading fake news [18]. Therefore, it is critical to know the source of fake news. The source detection of misinformation and rumour in the social networks are influenced by diffusion models, network observation and centrality measures; source detection approaches have a large variation in accuracy [19]. Bhaskaran (2017) mentioned that fake news spread due to illiteracy, traditional faith in media without knowing about social media platforms' ability to manipulate and spread fake news and slacktivist convenience. Identification of fake news involves rating system, sanction against fake news spreading platforms and development of algorithms along with manual intervention [18]. It was also noted that mainstream news channels are also telecasting fake news without doing fact-finding exercise [18]. Regulatory institutions and self-regulation do not stop the fake news, while challenges lie in media training [18]. Courts in India have been receiving a petition to regulate fake news and they argued that India does not have guidelines to regulate fake news and seek court intervention to regulate fake news in India [20].

## **2.2 Problem Definition**

Different approaches and methods have been adopted to detect fake news. There is a difference between real and fake news sources and propagation means. The source of fake news is associated with unauthenticated news source and the content of fake news changes while dispersing, whereas real news show wider dispersion without many modifications [21]. The perception about fake news differs among the individuals. The perception of individuals or groups about fake news influence on the third person is more strong than themselves or in-group members [22].

The behaviours of the individuals are different when informed and uninformed about fake news. Fake news influence individuals' behaviours to take business decisions [23]. Research in fake news on the social media domain is getting attention these days. However, to our knowledge, there are limited studies available about the approaches adopted by individuals to identify news while using social media platforms. This study is based on the approaches of individuals for authentication of social media content.

## **3 Model and Research Questions**

### **3.1 Research problem: Social media platform and the problem of fake news**

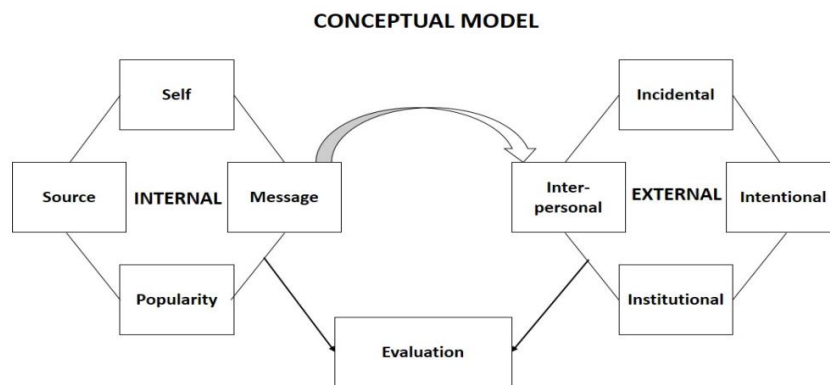
There is lack of guideline and standard which enables the containment of fake news; it emerges as a threat and social media content is motivated by political, cross-border, international aspects, psychological and so on. The easy target of fake news are the common citizens, and it is common to believe news shared and read by some people without understanding the motive of the news spread.

Fake news should be managed to maintain harmony in the society and trust of people in different institutions. Hence, there is a need to manage fake news spread on social media platforms. Individuals need exposers and means to curb fake news.

### 3.2 Actors in managing fake news

Managing the fake news is not possible only by social media platforms or governments. An individual need to participate in this exercise. This should be the responsibility of all the three key stakeholders.

### 3.3 Conceptual model



**Fig. 1.** Conceptual model of authentication [24]

There are two research questions in the context of fake news; the first is related to people's way of authentication of fake news; the second is whether there is a difference between the internal and external validations by the individuals? These are illustrated as below.

RQ1: How do people authenticate fake news?

People, in general, authenticate through two ways for any news: internal authentication and external authentication. These ways depend on the merit of news and can be used by people to authenticate and categorize as true or fake news.

RQ2: Is there a difference in internal and external validations by the individuals?

Internal and external authentication help people authenticate the news received on social media. Now the question arises whether there is any difference in external and internal ways of authenticating. The difference between internal and external authentication is analysed using the questionnaire research tool.

## 4 Methodology

The study is based on the review of the existing literature for the audience act of authentication social media. A quantitative survey was conducted to analyse the audiences' fake news authentication patterns. The respondents' responses were used to analyse the factors that they used to authenticate news on social media platforms.

A survey questionnaire was constructed, which was based on constructs emerging from the literature [1, 3, 4, 11, 13, 15, 16, 25] and expert opinions. From the literature, 26 variables were identified; these variables were further divided into two categories of internal and external sources of validation. The questionnaire contained information related to age, gender, number of hours spent on social media platforms in weekdays, number of hours spent on social media platforms during holidays and regions based on urban, rural and semi-urban residence. Questions were also asked based on the different social media platforms (Facebook, WhatsApp, YouTube, Twitter, LinkedIn, Snapchat, Instagram) use and purpose (time pass, entertainment, news, exam preparation, interacting with a friend, professional reason, knowledge).

Based on the literature review to understand the authentication used by individuals, there were 26 variables considered for data collection, and this was divided into two categories – internal and external based on the empirical model. The questionnaire was based on a 5-point Likert scale. Conceptual model was used to verify and establish a model for authentication in the Indian context.

The purpose of questionnaire development using 26 variables is to capture fake news authentication approach and difference in authentication model for Indian context.

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### 4.1 Data collection

The following variables were used for internal and external sources of authentication. The internal sources of authentication contained the following categories: (1) self – user authenticates news, (2) source – user authenticates news based on the source of the news, (3) message – user authenticates news based on message content and (4) popularity – user authenticates news based on the popularity of news. The external sources of authentication contained the following categories: (1) incidental and interpersonal – looking for friends over social media, (2) incidental and institutional – looking for news over other media, (3) intentional and interpersonal – looking for a family member or expert views on the news and (4) intentional and institutional – looking at external sources for verification of news.

Data were collected using online and offline modes. The questionnaire was based on Likert scale. The questionnaire had the following themes: the respondent's discernment and perceptiveness, message credibility, types of news, friend and relatives, multiple and trustworthy, social sphere and the formal sphere. The online questionnaire data were collected by sharing the link on social media platforms like Facebook, WhatsApp and Messenger. The offline data were collected from an IT company. The duration of the online survey was from 30<sup>th</sup> March to 18<sup>th</sup> April 2018, and the total sample size was 231 for the final analysis of the results.

**Table 1:** Demographics details (all figures in percentage)

<b>Age (years)</b>	20–25	26–30	31–35	36–40	41–45
Respondents	11.6	35.8	14.2	1.6	5.8
Location	Rural 8.4	Semi-urban 9.9	Urban 81.7		
Profession	Entrepreneurs 6.9	Private sector 52.7	Public sector 13.7	Student 22.9	Not working 3.8

## 5 Findings and Discussion

The following results emerged from the analysis of the data.

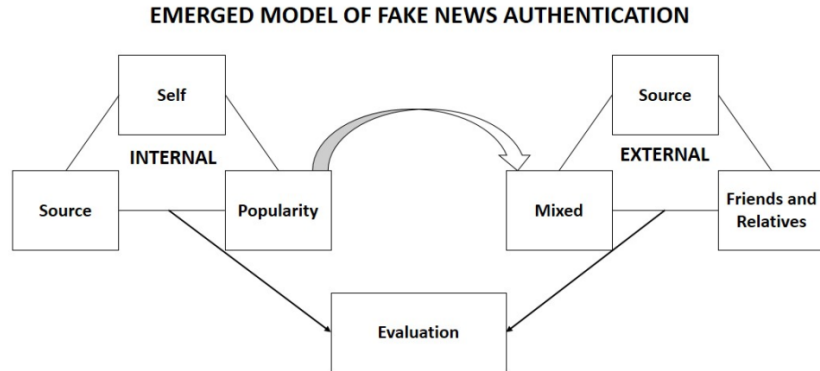
### 5.1 Social media platforms' usage

The internet use in India increased drastically in last one decade with 462 million active internet users and 430.3 million are active mobile internet users; 250 million active social media users and 230 million active mobile social media users on January 2018[26]. Regarding time spent on social media platforms, respondents were most active WhatsApp (85%), followed by YouTube. About 83% of respondents were active on Facebook followed by LinkedIn, YouTube and WhatsApp. In terms of social media platform where users were active, WhatsApp had active users followed by Facebook and YouTube.

### 5.2 Emerged model of authentication

The analysis of fake news by the users of social media results in the following six factors after exploratory factor analysis (EFA). EFA is a good factor analysis method for identifying the underlying relationship between measured variables. Here, six factors emerged after applying the maximum likelihood extraction method with Promax using Kaiser normalization rotation method. The Pattern Matrix shows values above 0.5 for all the extracted factors. The reliability test and Cronbach's alpha value for each factor are above 0.7. These factors are as follows: popularity, self, internal sources, family and relatives, external sources and mixed external.





**Fig. 2.** Emerged model of fake news authentication

These emerged factors are different from source questions based on the output of responses collected by Indian respondents of various locations and various professions with different age groups. Instead of the eight factors considered from source paper, a set of 26 variables are taken based on various papers and studies.

The emerged model for the authentication of fake news is influenced by the usage of social media platforms. Finally, the respondents indicated how they authenticate fake news on social media on different social media platforms using the 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Respondents' authentication is based on social media news popularity ( $M = 2.34$ ,  $SD = 1.14$ ). However, mostly authentication is based on seeing the news sources ( $M = 3.40$ ,  $SD = 0.92$ ). Respondents authenticate news on their own discernment and perceptiveness ( $M = 3.43$ ,  $SD = 0.97$ ). Respondents also look for their family and relative to authenticate the news ( $M = 2.67$ ,  $SD = 1.10$ ). The authentication is strongly related to the external sources, and those are considered as trustworthy ( $M = 3.75$ ,  $SD = 0.90$ ). External validation of the fake news is also based on mixed factors such as social and formal sphere ( $M = 2.87$ ,  $SD = 0.88$ ).

The respondents use both internal authentication ( $M = 3.05$ ,  $SD = 0.62$ ) and external authentication ( $M = 3.10$ ,  $SD = 0.70$ ) to authenticate news on social media platforms. On comparing these two types of authentication, respondents are more oriented toward the external authentication of social media news. The response of authentication moves from internal to external with more reliability on external validation of social media news ( $M = 3.28$ ,  $SD = 1.16$ )

### **5.3 Correlations between the following factors and social media usage**

This section provides insights about the correlation between age and social media usage, time spent and purpose of social media usage. This section enables to highlight the following critical aspects related to the research objectives, where social media usage specifies the target groups and platforms to target for fake news authentication.

### **Age and social media usage**

There is a negative correlation between the age and the number of hours spent on social media during holiday. This means that the less the age, the more time they spend on social media platforms. Also, this is statistically significant as the significance (two-tailed) value is less than 0.05. Age and social media platform, such as Instagram, are negatively connected too in the Indian context. The teenagers' usage of Instagram is more than senior adults. This is also statistically significant as the significance (two-tailed) value is 0.01.

Age and social media platform usages that 'entertainment' and 'exam preparation' are also negatively connected in the Indian context. Teenagers use social media for entertainment and exam preparation purposes than senior adults. This is also statistically significant as the significance (two-tailed) value is much less than 0.05.

Age and social media index (sum of all social media uses) are also negatively connected in the Indian context. Teenagers use social media more than senior adults. This is also statistically significant as significance (two-tailed) value is 0.005.

### **Duration of social media usage**

The number of hours on social media during weekdays is directly connected to the number of hours on social media during holidays. The mean value is around 0.65. The number of hours spent on social media during weekdays is directly connected to a purpose 'time pass' and 'news', which means people use social media for time pass and reading news during working days. However, this is a weak relationship, with the significance value (two-tailed) less than 0.05. In contrast, the number of hours spent on social media during holidays is directly connected to purposes such as 'time pass', 'entertainment', 'knowledge', 'exam prep' and 'news', which means people use social media for time pass and reading news during holidays. However, this is a weak relationship.

### **Social media platforms usage purpose**

Facebook and news are directly connected where people use Facebook for getting the latest news. YouTube and Entertainment are directly correlated, which means that people use YouTube for their entertainment. The usage of LinkedIn is directly connected to Facebook and Twitter, which means that people also use LinkedIn while using Facebook and Twitter. However, this is a weak relationship. The use of the LinkedIn is mainly for professional reasons. Twitter is directly connected to Instagram. Many people who use Twitter also use Instagram. However, this is a weak relationship.

The usage of WhatsApp is directly connected to Instagram, which means that people using WhatsApp also use Instagram platform. The usage of WhatsApp is more for interacting with friends.

Instagram and knowledge gain are negatively correlated. People use Instagram not for gaining knowledge related to any exam preparation. However, this is a weak relationship.

#### **5.4 Practical implications**

The study has the following practical implications for the stakeholders.

##### **Platforms**

Platforms are free for content generation, and they do not check or regulate content generation extensively. Most of the contents over social media platforms are politically motivated and are rumor, fake news and create conspiracy theory [14]. As of now, there are little regulation over online content publishing. Social media platforms allow most of the contents and share accurate and inaccurate information in the public domain. But inaccurate news is shared more frequently on social media platforms as it attracts many people in comparison to sharing of accurate news and verifying them. Fact-checking the news in general delays by 10–12 hours. By the time, inaccurate news is already spread by active users. Hence, platform needs to implement fact-checking mechanism to stop the spread of inaccurate news. This provides factors to be considered while planning to implement rules and policy to curb fake news.

##### **Governments**

There are issues with the authenticity and credibility of the news on social media platforms, and in some cases, these are inaccurate and politically motivated. The fake news on social media challenge the government and might spread the rumor which highlights the inability of the government and poses a threat to the public in large. During the US election 2016, false news spread more, and people started believing it [6]. A similar thing happens in most of the countries, and the government gets destabilized.

Previously, the need to create one web-based citation database for fact-checking was discussed. This might help the government to avoid spreading fake news and take necessary steps. The patterns of social media usage emerging in this study highlight the area to focus and how to increase positive engagement with citizens.

##### **Individuals**

Individuals who are more active in social media share known person content more than the others [27]. Hence, people create networks and try to add more individuals to increase their reachability. An individual trust the shared news and share them without knowing its effects or sources. This study provides an insight into the usage and methods of authentication of the fake news at the individual level. The authentication method does not seem scientific, for instance, if one weak link in the social media network is able to enter in a network, then there are chances that fake news can still spread despite the authentication at the individual level. Such uncertainty can be removed by focusing on factors from an integrated perspective of collaborations of individuals, platforms and governments.

##### **Managers**

The implications for the managers are at personal and organizational levels. These days various managers' positions are shared on professional social media platform

like LinkedIn. Organization these days look at candidate profile on social media and their information sharing patterns. Hence, managers need to restrict themselves to share any unverified information received on social media platforms. Such sharing activity can lead to job loss as organization reputation can get maligned due to their managers' action. Whereas at the organizational level, a manager can play a role to curb fake news spreading through awareness and training about the different factors of fake news spreading and complexity involved in the authentication of fake news.

## 6 Conclusion

Social media platforms have emerged as a good source of news. The accessibility to Internet and smartphones has enabled people in the developing countries to have various ICT services. Social media usage has become one of the preferred services. Usage of social media has opportunities and challenges. At the individual level, people are using social media platforms for various purposes such as information, social networking and entertainment.

Regarding challenges, they recognize the challenge of fake news and develop an authentication mechanism to deal with fake news. The authentication mechanism involves internal authentication and external authentication. The following factors emerged as the internal authentication: self, source and popularity; external authentication: source, mixed, friends and relatives. This article can be useful for stakeholders, especially those working on strategy building to deal with fake news for digital platforms and government. The present research has some limitation; it is based on the Indian context and have limited access to social media platforms data to incorporate in the research and future research can explore to include other factors and sub-factors of fake news authentication at different level; individual level, platforms level and government level in different social and political context.

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