

**A Critical Review on Role of Cognitive Attributes and Social Media
Literacy Towards Fake News in Social Media**

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Abstract

Social Media Platforms allow every individual to plant false information more easily. Spreading false information or fake news for political or personal gain is not a new or recent evaluation. Spreading the false information is easy but correcting the record is much harder. Past studies (Keersmaecker& Roets, 2017; Mele et al,2017; Mihailidis& Viotty, 2017; Allcott & Gentzkow, 2017; Rosset al.,1975) reveal that initial impressions in an individual is based on incorrect information. Initial impressions structure distort the processing and interpretation of new information. As a result, people are unable to interpret or re-attribute this inconsistent information. It becomes relevant for marketers to understand the role of cognitive attributes in interpretation of fake news. Digital misinformation in online social media is major threat to our society (World Economic Forum, 2017).Social Media Literacy plays critical role here. The focus of the present study is to critically evaluate the role of cognitive attributes and social media literacy in fake news interpretations through exploratory research. The findings of the study will create safe and better online social platform for all stakeholders (marketers, companies, consumers, users, distribution channel members etc) thereby resulting into stronger marketing eco-system along with improved customer relationship management outcomes.

Keywords: *Social Media Literacy, Fake News, Cognitive Attributes , Search Engine Ranking, Online Social Platforms.*

A Critical Review on Role of Cognitive Attributes and Social Media Literacy Towards Fake News in Social Media.**I. Introduction**

The massive inflow of information spread through social media has generated serious concerns emerging from fake news. Fake news has now emerged as yellow journalism. Massive digital misinformation is now widely available through traditional, print, broadcast and online social media. Some reporters promoting such false information are lured by unethical practices (cheque book journalism).

In India, around 326 million social network users are using mostly the social networks like you tube, facebook and whatsapp. Various factors like interpersonal networking type, algorithms, inner drives of users are contributing towards spread of fake news (Bakshy et al., 2015). Due to ideological homophile in online networks, fake information is treated as reliable by users (Spohr,2017)

Social media platforms allow every individual to plant false information more easily. Spreading false information or fake news for political or personal gain is not a new or recent evaluation. Spreading the false information is easy but correcting the record is much harder.

Without any doubt,one can say that the internet is witnessing massive creation of the fake news, mostly with the help of various social media platforms which have the power to disseminate information exponentially, with virtually unlimited restrictions. Even though, the term 'fake news' has become newsworthy only recently, studies on this subject have been broadly covered in academia in the areas of communication, economics, psychology, political and computer science (Allcott& Gentzkow,2017).

In the beginning, fake news use gained popularity in the entertainment, satire and parody. The purpose initially was to surprise others or to spread feeling of insecurity. In past, even news paper readers have been advised to cautiously treat the fake news. In the digital world, similar things are happening in the world. Though era is digital but reasons for spread of fake news are same. Financial motivation to spread the fake news is very strong. Advertisers are the major sources of funding to the internet. Reputed websites attract huge crowd and motivate advertisers also to go by them. The hefty fee paid by advertisers to such websites encourages website owners to publish popular rather true content and special incentive for

such content will play a key role in attracting crowd to the site. Now, people are attracted to rumors gossips and scandals. Website owners in the recent past wish to take leverage on non intellectual attributes of human nature. The focus now is confined to how many will be exposed to the product exposure rather than the credibility of the content.

Regret is sites having sensational news items are becoming more popular, experiencing the huge traffic on their website, thereby, creating an advertising opportunity. This human passion for sensation is encouraging advertisers to pay more to the writers of popular content. Such financial recognition empowers these popular websites to report anything as per their choice. In this dynamics of fake news, monetization encourages writers to focus more on sensational rather than a credible information.

Needless to say advanced technology has expedited information spread and now global consumption of any information is possible. This instant access to information really does wonders. Ideas can be shared in real time and it is now possible to connect to the regions neglected earlier because of distance. But in the absence of any organized regulatory mechanism in advertising, incentive for good has been replaced by incentive to make money. The outcome is proliferation of fake news .

It becomes relevant to examine the sources of fake news. Word of mouth is also being used to mislead outsiders in the group. Because of the informal channels involved, it becomes difficult to test the credibility of the information.

Inventions in media provided numerous options for news seekers. With the arrival of the internet, every one believes that we have got a platform on truly democratic and honest means of sharing information. Computerization helped the corporate world in storing the large amount of information. In the field of social media, computer code manipulation facilitates growth of fake news and severally affects the thought process of people.

For preventing the fake news, so many pathways are introduced (Meleet al., 2017). First of all, the cognitive ability of an individual may be strengthened through literacy or education and it will enable them to separate facts from fiction(Allcott & Gentzkow, 2017; Jang & Kim, 2018). But this pathway must not be viewed as a single alternative solution to the rising problem of fake news (Mihailidis & Viotty, 2017). Another alternative may be widening the availability of fact checking mechanism to users. But the efforts regarding fact checking are still inadequate (Bernhard & Dohle,2015). It becomes relevant to diagnose creation of fake content & eliminate (Ma,2016). This approach is gaining increasing relevance given that blog

accounts and a handful of websites are known to be substantially responsible for the prevalence of fake news.

Cognitive ability reflects the competence to obstruct and override learned responses of the past. It indicates the ability to think and act more practically by hypothetical thinking and cognitive simulation (Stanovich et al., 2016). Initial impressions in an individual is based on incorrect information. Initial impressions structure distorts the processing and interpretation of new information. As a result, people are unable to interpret or re-attribute this inconsistent information.

Individuals with weak cognitive ability face problems in adjusting existing schemes and initial judgements while confronting new and reliable information.

Information literacy with focus on social media and fake news seems to be the best option for preventing youth and general public from fake news victimisation. Earlier popular saying was, “you cannot trust everything published in the news paper”. Recently it is being said, “you cannot trust everything what TV shows” and today we are saying, “you cannot trust everything posted on social media”. Finally, healthy scepticism along with rigorous evaluation of sources – authors, publishers and contents are the tools for preventing fake news (Burkhardt, 2017).

Media literacy is the ability to understand, control and apply information available on media. Social media literacy can be achieved in multiple ways. Understanding youth as the dominant user of social media and most potential victim of fake news, it becomes imperative to make youth fully aware of psychological process. Imparting reasoning and critical thinking skills surely improve their social media literacy levels. The pedagogical tools during skill building in social media literacy must be offered in memorable ways, across the curriculum.

Algorithms such as bots are being used conveniently for manipulation and are disrupting social media community. Technological support who track fake news is in its infancy. Programmers need time to create advanced softwares for recognising and tagging fake news without human involvement.

One of the pillar of social media literacy is technology. Algorithm of bots is used to generate digital misinformation across social media. The companies are collecting large amount of data on internet surfing pattern, their social media usage, the items liked and

shared – such information is used by advertisers, web developers and schemers to track the big trends. The constraint is, possibility of data hiding bias in big data may affect the accuracy of these trends severely. Such use of big data for social media and internet will cause false image about brands, celebrities or groups.

II. Need & Objectives of the Study

Spreading false information or fake news for political or personal gain is not a new or recent evaluation. Spreading the false information is easy but correcting the record is much harder. Past studies (Keersmaecker & Roets, 2017; Mele et al, 2017; Mihailidis & Viotty, 2017; Allcott & Gentzkow, 2017; Ross et al., 1975) reveal that initial impressions in an individual is based on incorrect information. Initial impressions structure distort the processing and interpretation of new information. As a result, people are unable to interpret or re-attribute this inconsistent information. It becomes relevant for marketers to understand the role of cognitive attributes in interpretation of fake news. Digital misinformation in online social media is major threat to our society (World Economic Forum, 2017) .Social Media Literacy plays critical role here. The focus of the present study is to critically evaluate the role of cognitive attributes and social media literacy in fake news interpretations through exploratory research.

III. Review of Past Studies

Kanoh (2018) investigated the impact of persuasion power of fake news and associated it with food habits & found that persuasion for the fake news is perceived strong while eating and drinking. Keersmaecker & Roets (2017) concluded that lower level cognitive ability persons adjusted their attitudes to a lesser extent than individuals with higher levels of cognitive ability. Enhanced cognitive ability enables the individuals to evaluate the false information intelligently. Janget al (2018) worked on the origin of fake news and attempted to examine the significance of the difference of various characteristics of fake news and real news. Fake news generally emerges from the ordinary users while real news exhibit wider depth and shorter breadth and fake news shows wider breadth and shorter depth. Janget al (2019) proposed a model that directly combines the relationship and node's feature to detect customers of fake followers. With the experiment on Twitter, the model gains an edge over others in the detection of fake news. Ishida & Kuraya (2018) attempted credibility evaluation

using the dynamic relational network& finds that credibility evaluation is complicated task when attempted for the sole content as compared to mutually related news available with other effects. Shuet al (2017) focused on detection of fake news. Social media information has two faces; good (low cost, easy access and rapid dissemination of information) and bad(wide spread of misinformation). Fake news analysis can be attempted in two phases: characterization and detection. In characterization phase, basic concepts and principles about the fake news are introduced; second phase is crucial and involves detection approaches from a data mining perspective. Visentinet al (2019) examined to check whether individual perceptions of fake news is leading transfer to an adjacent brand advertisement or not. The news objective's truthfulness exerts no direct impact on behavioral intentions towards the brand. Even if the source is credible, the brand advertisement will not suffer from appearing next to fake news. Atodireseiet al(2018) acknowledged the presence of fake news, fake likes, and duplicate account on reputed social network like Facebook. The authors proposed mechanism for identifying the users as well as fake news in the Twitter social network. Pennycook& Rand (2018) Identified Cognitive Reflection Test (CRT) as a measure of the propensity to engage in analytical reasoning. CRT performance was found to be negatively correlated with the perceived accuracy of fake news and positively correlated with the ability to discern fake news from real news – even for headlines that align with individuals' political ideology.

Figueira & Oliveira(2017) propose an algorithmic solution that synthesizes the main concerns. They categorized the proposals as content based, source based and diffusion based. Wesselet al (2016) examined the impact of fake social information on consumers' decision-making in the context of reward-based crowd funding. Fake Facebook Likes have a very short-term positive effect on the number of backers funding the respective crowd funding campaign. Jang & Kim(2018) conducted an empirical study using 1299 samples from US about third person effects of fake news, and proposed path model for identifying the antecedents and consequences of the third-person perception. It was found that external forces, unethical composition apart from Partisan identity were positive predictors of the third-person perception. Third-person perception led to different ways of combating fake news online. Hong & Cheng (2018) examined the correlation among university students online trolling behavior and online trolling victimization forms, current conditions, and personality traits. Those who more frequently post text information on Facebook, their Online

trolling behavior is more common, different types of online trolling behavior are evocative trolling, malicious trolling, obstruction trolling, and pathological trolling. Various online trolling victimization types identified were; identity victimization, dissemination victimization, malicious victimization, and obstruction victimization. Sense of inferiority is a significant predictive variable for online trolling behavior and online trolling victimization. Craker & March (2016) investigated the relationship among the Dark Tetrad personality traits, social reward and Facebook trolling behaviours. Individual trolling behavior is better explained by negative social reward motivation than negative personality traits. Coles & West (2016) analyzed the use of term troll by online users and concluded that have conducted a study to analyze how online users mobilize and make use of the term 'troll'. Vigilantism, nostalgia and nasty are significant attributes of trolls. Fortunati & O'Sullivan(2019) compared the model print and digital media to examine the sustainability aspects. The contribution of print media is noticeable and will generate debate on sustainability in comparison with the contribution of the digital world. Lee & Xenos (2019) examined the context in which the political social media use and general social media use influence political knowledge. Political social media use does not have a significant effect on political knowledge, while general social media use has a moderately negative effect on political knowledge. Lee et al (2017) examined the relationships among news access via social media, perceived news information overload, news consumption, and perceptions of journalistic norms and practices. News information overload moderates the relationships between news access via social media and selective exposure and between news access via social media and willingness to pay for quality news.

IV. Discussion and Implications

The above mentioned analysis certifies the significant presence of cognitive attributes and social media literacy with reference to fake news. But the existing work seems to be inadequate and calls for a comprehensive and in-depth investigation of cognitive attribute and social media literacy in fake news management. The study by Atodiresei, et al (2018) speaks about credibility score of the social media user. The contribution is novel but it operates with tweets in English only. Further, it fails when the news is from the reliable sources. The ideal picture will comprise facilitating text in other languages also and removing immunity by expanding the model scope in trustworthy sources also. A Study by Shuet al (2017) develops the data mining perspective for fake news detection on social media. The social media platforms have caused serious change in consumption behaviour as compared to traditional media. It takes less time and money to consume news on social media. The exclusions to the

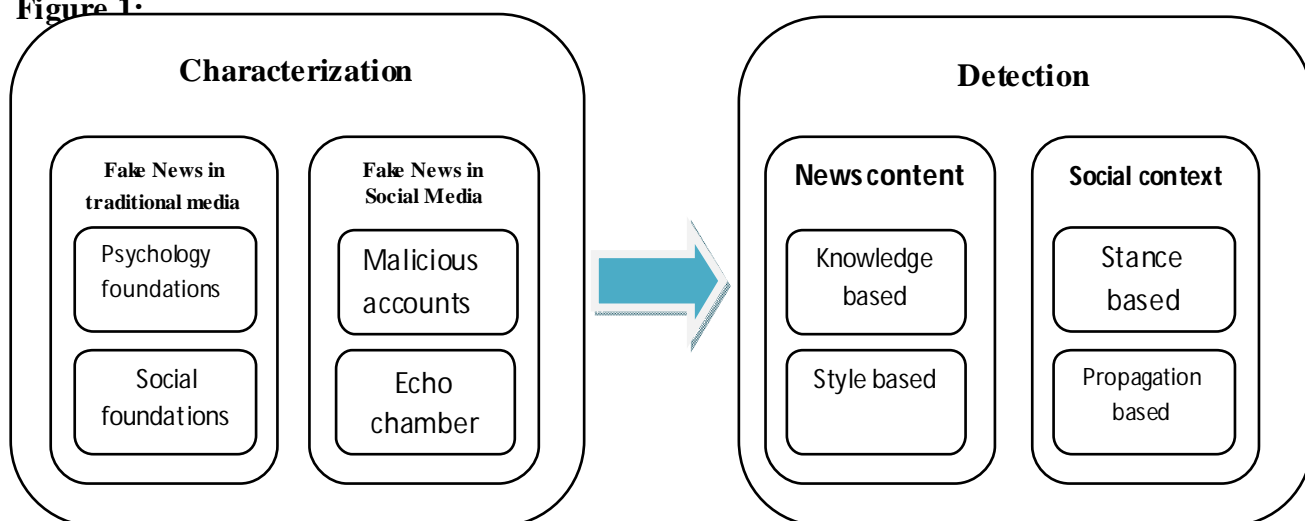
fake news are a) satire b) humour c) conspiracy d) misinformation e) hoaxes. It reduces the contribution of the study significantly. Social media information has two faces; good (low cost, easy access and rapid dissemination of information) and bad (wide spread of misinformation). Fake news analysis can be attempted to two phases : characterization and detection. In characterization phase, basic concepts and principles about the fake news are introduced ; second phase is crucial and involves detection approaches from a data mining perspective. The authors conclude that this auxiliary information is challenging in and users' social engagements with fake news produce data that is big, incomplete, unstructured, and noisy. More details on fake news detection with reference to four orientations (data ,feature, model and application) will provide the complete picture. The phenomenal spread of fake news is causing serious danger to individual and the society. Consequently, fake news detection is gaining huge popularity as emerging research area. The unique features of fake news detection on social media separate it from old detection algorithm used for traditional news media.

In the study, genuine attempt is made for fake news profiling but in detection phase data mining perspective needs more elaborative effort especially regarding feature extraction and model construction.

In the figure 1, Shu et al (2017) represent the contrasting viewpoint on fake news in traditional & social media. In traditional media, it is characterized by presence of psychology and social foundation as compared to malicious accounts and echo chamber in social media. In detection, knowledge and style are key attributes in traditional media as compared to stance and propagation as dimensions in social media.

Fake News on Social Media: From Characterization to Detection (Shu et al, 2017)

Figure 1:



Keersmaecker & Roets (2017) explained the criteria used by the people in adjusting their judgements. Once they found the source of crucial information used for initial evaluation was

wrong, people alter their attitude but cognitive ability affects their assessment ability of correction. Individuals having weak cognitive ability exhibit less flexibility in their attitude. And such individuals reflect biased behaviour and defer from other individuals having no exposure of false information. Effort needs to be made on prescribing valid path for reversing impact of incorrect information.

Fedeli (2019) proposed research agenda for fake news related issues in tourism sector but the effort remains to be exploratory and highlights the major challenges pertaining to the fake news spreading the tourism sector.

Janget al (2018) concluded wider breadth and shorter depth for the real news and wider depth and shorter breadth for the fake news. The focus here, is on origin and changing aspects of misinformation. But the credibility of framework performance is still to be tested. Fake news and real news have been compared but attention on linguistic aspects is inadequate. Besides no inputs on regulatory mechanism is offered.

Aldwairi& Alwahedi(2018) proposed solution for fake news detection and removing misleading information from website. The experimental design claims 99.4 percentage accuracy. The study identifies few fake news website attributes (Start with number, Content have title words, Contain question and exclamation mark, All words capital, User left the webpage immediately, Keywords). Manipulation through fake news and click baits reduce the productive use of information significantly. In dynamic business battle ground, fake news is not only a marketing problem but it deserves the special efforts from research community. Online trolling with the help fake news or click baits must be eliminated fully. Researchers proposed simple tool for fake news detection and screening and content screening. This work facilitates back and support for the corporate world but efforts to evaluate the aggression component from cognitive aspects are inadequate.

Jang(2019) infer that fast increase of relationship leads to growth of fake follower market and satisfying the customers who intend to see their relationship growing rapidly . Researchers proposed model for combining the relationship and node feature for fake follower detection. Detection of fake follower is comparatively easy rather than customer detection as the impact of negative word of mouth is high. Efforts need to be made towards the detection of fake customers accordingly.

Ishida& Kuraya (2018) attempted credibility evaluation using the dynamic relational network& find that credibility evaluation is complicated task when attempted for the sole content as compared to mutually related news available with other effects. The mechanism proposed in the study to paint the credibility color in the topic of fake news in the dynamic relational networks.It offers remedial actions but the problem root cause and diagnosis is overlooked.

Lavorgna et al(2018)observed that patients are keen for search of health information on web. The number of people suffering from chronic pathologies is on increase. Such people generally become easy victim of misinformation myths and therapies that are not scientifically proven. The inclination to trust internet for treatment is high. The study examined social media involvement of Italian web community serving people with multiple Sclerosis. The study certifies absence of fake news on the website and lends credit to the presence of neurologists and psychologists supervising the information flow. For better results, it would be meaningful to attempt similar investigation with larger population.

Visentinet al(2019) opines that the literature on impact of fake news on consumer evaluation of brand advertisement is inadequate. The impact of news objective truthfulness on behavioral intention(intention to purchase, word of mouth, stall visit) towards the brand is insignificant. It provides the relief to the brand managers by assuring that their brand advertisement will not suffer next to brand advertisements. Proliferation of fake news is a major threat to the brand. Global internet advertising expenditure crossed US\$200 billion in 2017 and created history as internet advertising surpassed traditional media spending. Efforts have been made by face book and Google to combat fake news by tracking fake stories with the support of independent fact checking organization and removing access of fake news publishers to their electronic advertising platforms. The study adopts content truthfulness and source credibility for measuring consumers' behaviors intention towards the advertized brands. It would have been more meaningful to include emotional aspects (brand love,self-concept and emotional attachment)and attitudinal loyalty for more comprehensive information. Global internet advertising expenditure crossed US\$200 billion in 2017 and created history as internet advertising surpassed traditional media spending. Ko et al (2019) attempted fake news detection with back tracking through cognitive mechanism(Fake News Detect System). Reverse tracking algorithm was adopted in two different case studies. The detection rate crossed 80 percent where the first case study identified fake news with 3 to 4 words & second focused on real news with 3 to 4 words. It would be appropriate to broaden

the horizon of the study by making it more comprehensive. Pennycook & Rand (2018) Identified Cognitive Reflection Test (CRT) as a measure of the propensity to engage in analytical reasoning. CRT performance was found to be negatively correlated with the perceived accuracy of fake news and positively correlated with the ability to discern fake news from real news – even for headlines that align with individuals’ political ideology. The issue of population representativeness and sampling techniques need to be addressed carefully during research on sensitive topic like political ideologies. It would be suitable not to restrict the research efforts to mere fake news detection but also the likely impact of such fake news on cognitive attributes comprising beliefs and behaviors .

Figueira& Oliveira(2017)acknowledges the weakness of the algorithm to cross check all posts. Besides the fake news tracking mechanism is not equipped with cross checking and doesn’t create history on the reputation of the sources.

Wessel et al (2016) examined the impact of fake social information on consumers' decision-making in the context of reward-based crowd funding. Fake Facebook likes have a very short-term positive effect on the number of backers funding the respective crowd funding campaign. The study claims longitudinal design for fake social information, genuine social information predicts consumer decision making. Also shorter positive impact can be generated by artificial manipulation of social information but overall effect is negative. In view of the contradiction in the result, it would be wise to examine the potentially distorting effects of fake social information through similar experimental design.

Haigh et al (2017) examined the online media modern journalism. Researchers used media literacy technique to track fake news.The effort deserves appreciation but seeks deep quantitative insight both on online media mechanism and media literacy techniques.

Jang & Kim(2018) proposed path model for identifying the antecedents and consequences of third person perception. The study advocates greater autonomy for media and endorses that individual with high degree of third person perception will support media literacy and discourage media regulation. The perspective of the fake news regulation needs to be addressed. Social media literacy scales would definitely add value to the outcomes.

Cardoso etal (2018) found that consumer purchase decision are predicted by online opinion and analyzed content based classification method for fake review detection. Value addition needs investigation on combining content based features with information about the product and behavior of the reviewer.

Albright(2017) found that fact based evidence does not engage audience and information trust is must in data content in place of trends. Need of the hour is to make facts relevant by conditioning the narratives rather than using deceptive statements. But comprehensive investigation with relevant quantitative approach will strengthen the views presented in the paper.

Kanoh(2018)examined the relationship of fake news with life style of social media users and found that persuasion of the fake news is strong while eating and drinking. The study restricts its focus merely on the activity(food and drinking) components of individual life style. It would be appropriate to examine fake news association with other activities and interest and opinion components of Life Style for a broader picture.

Algorithms such as bots are being used conveniently for manipulation and are disrupting social media community. Technological support who track fake news is in its infancy. Programmers need time to create advanced softwares for recognising and tagging fake news without human involvement.

Algorithm of bots is used to generate digital misinformation across social media. The companies are collecting large amount of data on internet surfing pattern, their social media usage,the items liked and shared – such information is used by advertisers, web developers and schemers to track the big trends. The constraint is possibility of data hiding bias in big data may affect the accuracy of these trends severely.

Conclusion

Cognitive ability is the capability to obstruct and override learned responses of the past.Need for the enhancement of the cognitive ability becomes more relevant in times of digital misinformation where initial impression structure distort the processing and interpretation of new information and consequently overriding this inconsistent information becomes impossible. Social media literacy seems to be the best tool for preventing fake news victimization. It becomes imperative to make youth fully conscious about psychological process constituting reasoning and critical thinking skill.

The above mentioned implications evaluate numerous approaches pertaining to cognitive attributes (cognitive reflection test, third person perception),fake news detection, analysis and control (Dynamic relational network, data mining technique, fake news detect system) and social media literacy (Psychological processes, reasoning skill , critical thinking skills ,expertise in IT devices).Global internet advertising expenditure crossed US\$200 billion

in 2017 and created history as internet advertising surpassed traditional media spending. This development has two fold implications. One is, companies are trying to generate shorter positive impact through artificial impact (revenue) social information. Second, it will cause contradiction to their own sustainable marketing philosophies. Need of the hour for such companies is to forego short term gains and adopt socially desirable practices for larger interest of marketing and that of society.

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