ISBN: 978-628-95207-8-1. ISSN: 2414-6390. Digital Object Identifier: 10.18687/LACCEI2024.1.1.258

The influence of social networks on the generation of disinformation shortly

Gabriel Silva-Atencio, PhD
Universidad Latinoamericana de Ciencia y Tecnología (ULACIT), San José, Costa Rica, gsilvaa468@ulacit.ed.cr

Abstract– ***The research aimed to identify how the evolution of communication channels, mass media, and social networks have influenced human behavior, affecting the individual's decision-making processes. The approach was qualitative, descriptive, and literature review, where through a systematic review on the Internet and online scientific databases, the factors that influence and generate misinformation, affecting society's decision-making, were identified. A qualitative study that required tools to investigate how social networks are used and their effectiveness has been created. It was determined that the use of emerging technologies in social networks suggests a development in communications but also dangers in disseminating disinformation.***

Keywords-- Social media, Digital relationships, Cyberbullying, Artificial Intelligence, Big Data.

I. Introduction

In the digital era, the influence of social networks and the media are having a significant impact on the lives of human beings, either positively or negatively, because it influences their ability to make decisions, such as electing a presidency, or any critical position, whether in the public or private sector. Likewise, social networks affect public opinion of a country, among other essential issues, being the evolution of a communication tool that has allowed us to have a positive or negative image of them, this has been a phenomenon that has changed how human beings interact, the advent of new technology that used incorrectly can become a source of misinformation for society.

The study emphasizes the need for awareness and education to address the negative consequences associated with these changes, such as the spread of misinformation, cyberbullying, psychological disorders, and challenges in human relationships. This study aims to find possible solutions and promote knowledge sharing to mitigate the adverse effects and promote healthier interaction with technology and information [1]. The human being is a being that can be influenced, and this is not something new; it is not a novelty, but how this happens has evolved over the years, and this has been given by how the subject has changed, how communication is given in the mass media and by the emergence of social networks in our society.

Information is one of the most precious commodities in our society, along with black gold, diamonds, and life itself. We must stress that this is nothing new; it is not a myth or an assumption; information has cost people their lives throughout history. Communication was essential even in the wars of our ancestors. Whoever won the battles often had privileged information that could define the outcome of a battle, and, above all, the most favorable outcome was for the one who knew how to make the best use of it.

The world has remained virtually unchanged in these matters, only that the way of obtaining information has been drastically optimized by globalization, the new industrial age of technology. In addition, the practice of exploiting this information has increased in new ways with technology implementation. Thus, the volume of data to be obtained is even more important; the methods to exploit it and the need to do so have multiplied.

To this has been added the involvement of social networks, the access to the Internet by people of all social strata as an obligation, as a necessity, and also, the access that people have to technological devices with the palm of their hands such as a smartphone, a tablet or other increasingly diverse ones.

The technological infrastructure of cities is becoming increasingly extensive, the networks even faster, and the need for speed and immediacy in handling information and communication have changed how we interact with the world, the news, and others, and even how political campaigns are developed.

To this, we also add the emergence of new crimes, new diseases, or psychological affectations such as self-esteem of people and their perception of reality to the point of spreading negative messages and even suicide, in addition to cyberbullying, physical harassment; the emergence of new problems and we could even say, new social diseases such as misinformation and on the other hand, the problems in human relationships have gone to technology since the person has a complex password on your mobile or why? Write to someone, or why do you give a "like" to a status or publication? Why do you have an interest in a topic? Or why do you publish something? now people have become political scientists, historians, coaches, psychologists, writers, artists, and photographers, and the list does not end there, because now you also look for a job on the Internet and the printing of your resume has become secondary, now your recruiter can write to your inbox and not to your email.

Perhaps it is a disease that can be declared without a cure, not because it does not exist, but because it depends on information that this solution reaches everybody, because it requires education. After all, it requires sharing this solution with everybody; they want a small quantity of this cure. The

Digital Object Identifier: (only for full papers, inserted by LACCEI).
ISSN, ISBN: (to be inserted by LACCEI).
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first step could be awareness, and the next step is to spread all the results obtained in that step toward understanding, towards practical knowledge, to get a solution.

II. Literature review

The way of thinking of human beings is based on what they perceive in their environment, together with the teachings they receive from their childhood and the confluence regarding what they live, being increasingly intense experiences in less time, thanks to the fact that they are bombarded with data every day by various media [2], where the information is extensive and on various topics, which leads to the generation of information or misinformation [3].

The emergence of the Internet allowed communication to take place massively and unilaterally since it shared data through the web, using documents so that people who read it could not send any response, comment, or interact with such publications; basically, we were talking about web pages composed of documents, where the author shared an article, text, idea, etc.; on a topic of interest to him or others [4, 5]. Also, some services offered data submission through forms containing an email address [6].

The growth and expansion in the use of the Internet were complicated because it introduced new articles based on Extensible Markup Language (XML); this was a challenge at that time because the technology available at that time did not allow for creating content quickly, simply and with editing options to incorporate custom coding, as do today's WordPress platforms or Hypertext Markup Language (HTML) code editors, which distinguish tags with distinctive colors [4]. However, with the advent of Web 2.0, the whole game changed; due to the emergence of electronic information networks, which gave access to tools for publishing content in personalized spaces easily, quickly, and simply and promoting interaction among the community of readers in a standardized way [7].

Currently, content creators are known as de facto users. They can be anyone, causing the Internet to become a meeting point and generating a multilateral communication model that does not depend on a single auditing entity [8, 9]. Reference [10] proposed a unique concept of this change in people who assume the role of producers, readers, and consumers of content, accommodating prosumers, and understanding that they consume content and produce it.

Likewise, the evolution of technologies has allowed a change in the paradigm of how information is shared, as they incorporate the use of new media such as audio, video, text, and images, giving rise to specialized social networking platforms, such as Instagram, Facebook, TikTok, Twitter and YouTube [11], generating a more interactive, broad and diverse network, where, its members interact by similar tastes associated with music, photography, video, images, among others [12].

A feature offered by social networks is access to the general public, not limited to people with whom we agree on a particular taste, but promote interaction based on a broader scope, for example, the creation of a political profile and having "followers" who can see their publications and interact with the candidate or political party [13]. Reference [14] identified the factors that govern the behavior of a follower within a social network, being:

1. Like a post
2. Recommend a post.
3. Share it (post it on your profile so that your friends or followers can see it).
4. Comment on the post (a statement is seen on a post usually in order with other words as if it were a chat conversation).
5. Tag people (A tag is a call for attention, which in English is known as a "poke," which, by direct translation, although not precise, is said "touch" where other people are mentioned or the placement of a tag is made indicating that this person appears in a multimedia file such as a video or image, or, that you may be interested in this).
6. A person can comment on the comments of others; this is known as replying to a comment.
7. React to a publication (in addition to liking, a person can react to a journal to show emotion, such as I love it, it disgusts me or it saddens me, depending on the social network).

Undoubtedly, technology plays a vital role in the use of social networks, as it allows the processing and interaction of its members, even promoting actions such as placing posts in publications to increase their relevance and increase visitation [15], where, through mathematical algorithms, they train, learn and conclude that these patterns of behavior are more significant and have greater relevance than others in the network [16], causing the term social network in the presence of technology to be distorted, since the interaction is person-machine and not person-person. Likewise, commercial advertising compromises the veracity and validity of the information since it influences, generates a bias, and distorts communication in favor of advertising content [10].

Reference [17] highlights that with the advent of Web 2.0, users have been stratified into at least seven social groups: adolescents and youth, marginalized, women, entrepreneurs, influencers, students and seniors, and at least five areas explored: commerce, tourism, education, health, and communication. From another perspective, Reference [18] emphasizes that social networks break the scheme in the use of filters since they reflect the user's feelings without any type of restriction, being able to generate support or rejection of the expressions and thoughts of the individual.

An example of this phenomenon was the cases studied by Reference [19] in the use of social networks in the election of Donald Trump as president of the United States of America; and Reference [20] for the election of Nayib Bukele as president of El Salvador, where, the candidates did not have any type of interaction since they were in different countries and moments in time, but coincided in the use of the same

social network: Twitter, which they used to share their likes, daily life, opinions, among others, generating a perception of closeness with their voters, something that before was far from being possible and was limited only to the close circle. While the media were used for the distribution of advertising against or in favor of various parties, sharing work plans, the projects they were carrying out, and even informing the position of these, causing the massive growth in the use of social networks as spaces to advertise, sell and inform the general public, and decreasing participation in traditional media, such as television, radio and print media. In the case of Nayib Bukele, it has included the dismissal of public officials from social networks, gaining popularity because everyone on Twitter learns about what used to be a private situation of Casa Presidencial.

References [17, 18] agree that social networks are the most used platform for journalistic purposes, being the leader of Twitter, since it turned the social network into a legitimate source of data, causing misinformation due to the lack of verification and validity by an accredited entity. Likewise, the researchers mention that one of the failures is the free generation of content on Web 2.0 because it lacks data verification with truthful sources, and the publication of ideas, thoughts, and criteria cannot be considered valid since they can adversely influence a particular social group.

A positive aspect of using social networks is the ability to democratize information since it allows the sharing of data in an open and public way, generating debate, awareness, and decisions about the direction that a country or a particular society can take [21]. However, shared culture opinion spaces lack verification of sources, detailed review, and in-depth data reading by individuals, to verify whether the shared content is true or false, causing adverse results or for malicious purposes, generating misinformation [22].

A concrete example of the misuse of social networks for malicious purposes was the case of Cambridge Analytics, as the company used its capacity, knowledge, experience, and expertise, in the use of technology to generate and disseminate false data, through rumors, lies, and in general, disinformation that many people also shared because it was a topic related to their belief or support and, therefore, generating total disinformation increasingly more comprehensive with the potential to affect a vote as happened in the 2016 U.S. presidential election 2016 [23, 24]. Now, without any control, without referring legislation, without a mandate to carry out monitoring and auditing of how these spaces can be improved, without education and proper dissemination of information and, above all, the development of people's critical thinking, there is no way for these spaces to become healthy spaces that allow citizen information and participation in the issues that concern them and affect us all.

However, Reference [25] rescues the role of technology as a tool for interaction in a social network since it allows people to establish a "personal" space with information about their interests, whether personal or professional and share it through profiles with other people with similar tastes or affinities, that is why, social networks go beyond being applications, where people interact because they are systems with complex infrastructures, which are characterized by the presence of emerging technologies such as:

1. Load Balancer and Web Application Firewall (WAF).
2. Artificial Intelligence.
3. Virtualization Platforms.

Reference [26] highlights the role of Artificial Intelligence (AI) and Machine Learning (ML) in the management of data within social networks. AI allows the optimization of the data that are received through the replication of a query through multiple channels, also known as caching, where the effect generated is that people see the reflection of an object in a mirror, i.e., queries are replicated through multiple output channels instead of being performed separately, which saves many processing, memory, and server resources. While ML enables an automated understanding and combination of data entered and historically stored in the social network, mathematical and statistical models make predictions that provide agile solutions to tasks or processes in the social network. Also, AI and ML simulate the ability to read individuals' behavioral patterns of taste and consumption through seasonal advertising, prescribing, and inciting the consumption or purchase of a product, sound, or service in network users.

Reference [27] states that technology makes business models become magical and surprising structures since decision-making based on data offers a competitive advantage and evolves the company towards a digital strategy, thanks to the use of Business Intelligence (BI), Big Data, and AI, and establishing new entry barriers in the environment. Although it is a unique opportunity for the enterprise, it also possesses its dark side because cyber criminals can use the technology for malicious purposes.

Reference [28] identified the use of AI applications, known as Bots, to create fake profiles programmed within social networks, to replace the individual in performing informative and routine tasks at certain times. For his part, Reference [29] categorized the uses that can be given to Bots to see the impact on social networks and the company, being these: 1) Chatbots, 2) Crawlers, 3) Transactional, informational, and entertainment Bots, 4) Scrapers, 5) Hackers; and 6) Identity supplanters, where, the problem arises when differentiating the behavior of these Bots, and cybercriminals know it and take advantage of the moment, using them as an anonymous army that writes false narratives in a social network. Reference [30] indicates that the danger that exists with the use of this technology is not the technology itself but the lack of an entity that controls and regulates the data management models and the privacy of the individual.

Another example of the inappropriate use of data and the generation of false narratives is the fake news in the networks, either by the individual or by programmed applications, also known as Trolls. Reference [31] indicates that fake news is conscious or unconscious lies distributed by various means and with a tremendous impact on the dissemination of

disinformation because the individual behaves according to the information found on the Internet and then is informed by the social behavior of the moment, for example, people are replacing consultations to traditional media (television, radio and print media), by the information available on social networks (YouTube et al., among others). The problem lies in the completely free access to this information to the significant majorities, and at the same time, in the need for more regulation and transparency of whether this information is false or not.

Undoubtedly, this phenomenon has changed the paradigm of communication between human beings. Reference [32] states that networks have become the meeting place for society to communicate, and share their ideas and thoughts, according to their tastes and interests, while Reference [33] argues that networks generate a non-objective attitude because they mediate communication through technology, thus, inhibiting interpersonal emotions and other reactive attitudes of the individual.

The evolution in social networks has significantly impacted the way people relate since interaction today is digital, reducing human contact, and becoming negative because fake news now is digital and is spread faster and more efficiently because the interaction through social networks is immediate [34].

Social networks have become a new model of identity for the individual since technology has masked the psychological and social phenomenon of how relationships are generated today, giving room for the phenomenon of cyber identity, being able to generate in people an erroneous perception of who they are and how others see them [35].

Reference [36] indicates that interactions through cyber identity deteriorate the physical and digital relationships of the individual, generating phenomena such as cyberbullying, cyberbullying, and even suicide, due to the lack of physical contact between people, bringing out the worst of society in the field of digital harassment and suicide.

Reference [37] agrees that the popularity of online communication is accompanied by the development of superficial relationships with strangers, increased risk of addiction, and increased likelihood of being a victim of cyberbullying, cyberbullying, among others.

III. Methodology

The research had a qualitative, descriptive, and literature review type approach due to the specific requirements of the study about external perspectives to give a broader view of the phenomenon [38, 39], being misinformation, through fake news in social networks and its possible impacts the object of study.

Reference [40] mentions that to understand how the market, technology, and learning are related, it is necessary to understand the current situation of the phenomenon and, from there, the interactions that it can generate with other orientations, being this the roadmap that guided the research.

As a method of data collection, a literature review was conducted through a digital search to find outstanding information on the influence of misinformation in social networks on people, using online databases such as Business Source Complete, EBSCOhost, Emerald, ScienceDirect, Scopus, Pro-Quest Central, Web of Science, and the Internet engines of authors, expert communities, manufacturers and suppliers. The search only included articles, papers, blogs, and official websites written in English and Spanish. The information collected was then verified, and through the expert judgment of the research team, data that were not relevant to the study were discarded.

According to Reference [41], Los qualitative studies may require the use of tools for the investigation of a specific topic and its effectiveness; since it is possible to construct a document from existing information on a problem already studied, where the literature review will be the primary source of information, this being the line of work used in this article.

IV. Results and Discussion

Technology has expanded the individual's knowledge in the digital era, allowing not only to help in problem-solving but also expanding the capabilities in new areas such as family, social, and business, where social networks stand out as one of the leading actors of this phenomenon.

Therefore, when conducting the literature search on the Internet on the influence exerted by social networks to generate misinformation about people, 9270 research articles were identified that addressed the positive and negative aspects of using this technology (see Fig. 1).

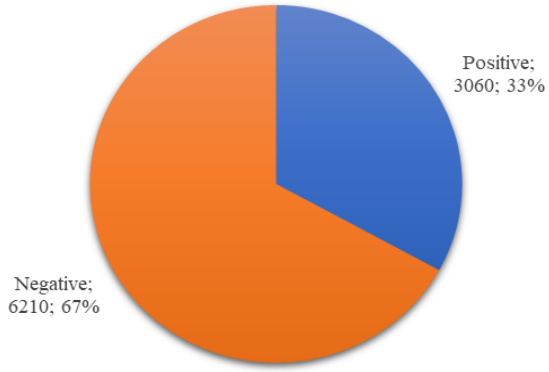

Fig. 1 Results of research articles that address positive and negative aspects of the influence of the Internet on social networks to generate disinformation about people.

On the positive side, 3060 research papers were identified that highlighted the contribution of social networks on people, where, through the use of word count, phrases, and the number of quotes made, the following stood out as the most relevant References [42-45] cites that at the time of the COVID-19 pandemic, social networks became a window of communication of individuals with the outside world,

allowing to maintain the concept of society that we know today, in turbulent times. While References [46-48] agree on the contribution of social networks in the acceleration of digital transformation processes in companies, in conjunction with the use of emerging technologies such as BI, Big Data and AI, which allowed not only the survival of the business sector but the identification of new market niches; Reference [49] highlight that thanks to emerging technologies and data management in social networks, it was possible to maintain effective, efficient and timely communication during the pandemic, becoming a critical means of communication in times of crisis.

Undoubtedly, the impact of COVID-19 accelerated the adoption of new technologies, and changes in people's lifestyles and habits, establishing new ways to communicate and positively influencing the improvement of capabilities, communication skills, and information management. Reference [50] among their findings identified that the combination of the use of digital tools and social networks generated a positive transformation in the competencies of students during their university education.

However, not all glitters are gold because, like other disruptive technologies, social networks have their dark side, mainly inherited from philosophical aspects and societal discussions about the information's authenticity, veracity, and reliability.

On the negative side, 6210 types of research highlighting the influence of social networks in the generation of disinformation were recognized, with seven categories being the most relevant and currently discussed in the state of the art.

The first category refers to research by References [51-54] on the use of social networks to spread fake news, disinformation, and misinformation by individuals and companies for commercial or malicious purposes, they aim to influence decision-making through content, images, or people who exerted a massive influence on the population, either because of their fame, prestige, or power.

The References [55-57] highlight the importance of the use, management, and manipulation of data through social networks, to misinform and influence the behavior of a given population for political, commercial, religious, military, and other purposes; and without any mechanism for verification, validity and control of the information.

The evolution and massification in the use of social networks have led to the incorporation of new technologies to process large volumes of data in real-time, but without establishing the mechanisms of authentication, verification, and reliability of the data, according to the good practices of industry and academia, thus generating false information. An example of this practice is the recent proliferation in the use of generative artificial intelligence through the application of ChatGPT, where the information provided lacks scientific and commercial validity in specific fields [58-60].

The findings of References [61, 62] highlight that the excessive use of social networks is generating new psychological illnesses in individuals, such as obsession and the belief that the information given is authentic and truthful. On the other hand, References [63, 64] proved that the excessive use of social networks is generating new paraphilias in society, such as cyberchondria, cyberbullying, cybersuicide, and cybersex.

The influence of social networks in today's society is generating a change in the behavior of human beings, according to the studies of References [65-68] highlight that technology is cracking and replacing the behaviors and relationships between individuals; and lacking a mechanism to validate the information, these behaviors can be manipulated for particular purposes of certain groups. In this particular, References [69, 70] highlight that the use of technology in social networks, such as WhatsApp and Facebook, has generated a change in the pattern of conduct, behavior, and relationships in the personal, family, and professional aspects of society, with changes in mood being widespread nowadays, such as apathy, stress, bad mood, among others.

The last category in the findings obtained was the risk of the violation of privacy and data protection, References [71, 72] mention that social networks do not have sufficient mechanisms to safeguard the confidentiality, integrity, and availability of individuals, being a critical vulnerability and used by hackers for the dissemination of false news, disinformation, and misinformation.

All of the above gives us clear evidence of the latent risks in social networks to spread misinformation and influence the decision-making processes of individuals. Faced with this problem, the literature review was complemented by the search for solutions that will change how people use the Internet and social networks, giving room for four possible lines of action.

First, the establishment of rules and regulations for the protection of privacy and data protection. Although in Costa Rica, there is currently a guideline under Law No. 8968 of the Agency for the Protection of Inhabitants' Data (PRODHAB), which regulates the processing of data by organizations [73], it is not enough to ensure the safety of citizens, because since the emergence and evolution of social networks, the rights of individuals, as owners of their information are not being safeguarded, with due care by companies that use the data for commercial purposes. However, there are currently initiatives at the international level that seek to regulate the use of data as a right of the individual, as was done with the General Data Protection Regulation (GDPR) in the European Union [74], which established the guidelines for data governance, as a mechanism to safeguard the privacy of the individual, because it establishes the basis of the digital footprint of people, both on the Internet and in social networks. Reference [75] comments that digital footprints give indelible power, property, and right over information to individuals and should be considered in the regulation and standards as the responsibility of companies to safeguard this data.

Secondly, there is organizational and corporate responsibility because the image can be affected by the

incorrect or unethical use of data, as happened in the case of Facebook and Cambridge Analytics [24], where their corporate images were seriously affected by being audited by regulatory bodies, which placed on trial the use of data for the generation of false news, disinformation, and misinformation.

Thirdly, the use of technology as a support tool in the fight against the generation of fake news, disinformation, and misinformation, because every day, the use of Big Data and AI is adopted and generalized as a tool for analysis and data mining in real-time, both on the Internet and in social networks, where, mathematical algorithms should be used as models for authentication, verification, and reliability of data sources, both in science and industry, allowing not only to improve the capacity of analysis, performance, but also offering truthful information [76].

Finally, the processes of education and awareness, because is essential to promote awareness in the individual, business, and society about the correct use and its impact on the generation of fake news, disinformation, and misinformation; this is because the pillars of knowledge will be based on ignorance and omission, due to the lack of valid criteria that allow identifying, what is accurate or false [77].

V. Conclusions

In the digital era, the correct use of technological advances is the responsibility of individuals because they are gaining more and more space in everyday life, from the way they interrelate and even decision-making through artificial intelligence, generating a great debate in society, related to the validity of the data, which these technologies, companies, and individuals use to share truthful information.

The world is exposed to a higher level of transparency; the problem is that no one knows if the source is truthful with social networks, probably the regulation will take a long time to arrive, and if it is never decided to regulate, we are the ones who must control the purposes for which social networks are used, from LinkedIn that can be to find a job to Twitter that can enhance a presidential campaign.

The issue of transparency can affect companies and their image, so they must follow up on customer complaints or behaviors that warn that something is wrong with their operations in different branches of a region or countries whether it is a regional or global brand.

Of course, in the future, there will be an end to data for malicious and purely commercial or mercantile purposes. However, this way of acting is destructive for businesses, citizens, and companies. Hopefully, the market and companies that maintain transparency will be able to remove companies that use consumers' or other companies' data for destructive purposes from the business game. A parenthesis must be made that in countries like Costa Rica, where society and universities are organized and issue communiqués on different issues that affect the nation-state, companies, and citizens must be very careful of what they publish and how they handle it.

It is necessary to work against misinformation and misuse of networks and promote the efficient use of a scope and scale for entrepreneurs, companies, and good citizens with positive purposes on social networks; also, social networks surround the work area and can even increase sales and performance of a company. As an example, the case of El Salvador is presented. When learning about public phenomena that affect society and everyone can comment or see from their cell phone through social networks, President Nayib Bukele passes the radio and television channels through social networks, so everyone, regardless of which country in the world, is aware of what he is presenting to the country and makes it public through Facebook live.

On regulation, in countries like Costa Rica, to be a member of the College of Professionals in Informatics and Computing (CPIC) as a computer scientist, it is essential to apply the code of ethics, which among other things, refers to having a necessary influence on the solutions developed and even codified as computer scientists, programmers and managers of technological solutions. This may limit doing the right things, at least in the Information Technology sector; however, more is needed because we all use social networks.

The practical implications of the results lead to a change of perspective approach in using technologies in the digital strategies of individuals, companies, and society. Social networks connect us and should work in that direction in the future to generate more transparency in society and individuals. Therefore, social networks will become an instrument to ensure the success or failure of emerging technologies in improving the communication processes of individuals.

The implications for academia refer to the fact that universities are now under constant observation by their stakeholders, as are city councils, regional governments, state deputations, and governments, i.e., we are all observed and exposed to very positive things being said about us, but we all have to preserve that image that is congruent with our integrity.

Finally, the processes of education and awareness must change because it is essential to promote awareness in the individual, the company, and society, about the correct use and its impact on the generation of fake news, disinformation, and misinformation; this is because the pillars of knowledge will be based on ignorance and omission, due to the lack of valid criteria that allow identifying, what is accurate or false [77]. In this last level, continuing education programs and the University can help a lot by educating the population on how to properly use the information and the benefit for everyone to know, give their opinion, share, and offer or validate knowledge for others anywhere in the world.

Acknowledgment

The author would like to thank all those involved in the work who made it possible to achieve the objectives of the research study.

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