Big Data and artificial intelligence as solutions to disinformation

El Big Data y la inteligencia artificial como soluciones a la desinformación

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Abstract:

Big Data and artificial intelligence are being harnessed to fight disinformation, which encompasses all possible aspects of false, inaccurate or misleading content, projected, presented and promoted to cause harm. To tackle this phenomenon, organisations, entities, governments and the media are launching different initiatives. Many of them make use of Big Data and artificial intelligence (AI) which, with the development of algorithms, design and implement bots and platforms whose aim is to put an end to intentionally misleading information. This essay offers an overview and a tour of some of the projects that the European Union has launched based on Big Data, data science and artificial intelligence to disarm disinformation and hoaxes, such as the FactCheckEU or FANDANGO projects. To this end, a qualitative documentary bibliographic study has been applied to propose a series of measures that can limit the dissemination of false information and to conclude that the European Union currently faces the great challenge of combating disinformation and is dedicating a significant part of its resources to identifying the problem and proposing solutions.

Keywords:

Big data; Artificial intelligence; Disinformation; Hoaxes; Europe.

Resumen:

El Big Data y la inteligencia artificial se están articulando para luchar contra la desinformación, que comprende todos los aspectos posibles de lo falso, contenido inexacto o engañoso, proyectado, presentado y promovido interesadamente para ocasionar algún daño. Para hacer frente a este fenómeno, organizaciones, entidades, gobiernos y medios de comunicación están poniendo en marcha diferentes iniciativas. Muchas de ellas hacen uso del Big Data y de la inteligencia artificial (IA) que, con el desarrollo de los algoritmos, diseñan y ponen en marcha bots y plataformas cuya pretensión es acabar con la información intencionalmente errada. El presente ensayo ofrece una visión panorámica y un recorrido por algunos de los proyectos que la Unión Europea ha puesto en marcha basados en el Big Data, la ciencia de datos y la inteligencia artificial para desarmar la desinformación y los bulos, como los proyectos Fact-CheckEU o FANDANGO. Para ello, se ha aplicado un estudio cualitativo documental bibliográfico que ha permitido proponer una serie de medidas que pueden limitar la difusión de información falsa y concluir que la Unión Europea tiene actualmente el gran reto de combatir la desinformación y está dedicando una parte importante de sus recursos a identificar el problema y proponer soluciones.

Palabras clave:

Big Data; inteligencia artificial; desinformación; bulos; Europa.

1. Introduction

The phenomenon of disinformation is of great concern in democratic countries (Rodríguez-Martelo et al., 2023). Through hoaxes or fake news, strategies are normally used to manipulate citizens and undermine the policies of governments and their institutions (Arrieta-Castillo and Rubio, 2023). Misinformation is directly related to propaganda and fake news or hoaxes.

This trend has long represented a major threat to the freedom of citizens and to all democracies. However, it is nowadays, because of the rapid expansion of campaigns due to social networks on the Internet, that it is becoming more of a priority. In recent times, both flows have developed, that of information and that of disinformation, as manifested in the infodemia produced on the networks in the context of the coronavirus pandemic (Sánchez-Duarte and Rosa, 2020).

It is important to emphasize the right of citizens to be provided with quality information, consequently, the media must ensure that their information content is honest and rigorous, aspects that mass-media professionals must take care of (Flores, 2019).

Through action against disinformation, the Government of Spain (n. d.) points out that coordination with several important factors is vital: academic institutions, technology companies, civil society and fact-checkers. Also, strategic communication

emerges as another of the fundamental tools to combat disinformation and claims a broad approach to the issue of disinformation that affects us so much.

The advent of artificial intelligence (AI) has increased the possibilities of combating disinformation. AI is understood as the use of computing devices for processing volumes of information that results in reasoning or behavior that simulates human beings (Sanchez and Ruiz, 2020).

The European Commission (2019, p. 6) expands the definition and states that "artificial intelligence is a set of human-designed software and hardware systems that, given a complex objective, act in the physical and digital dimension".

In the 21st century, virtual reality, chatbots, 360-degree videos, blockchain, augmented reality, Big Data culture or the presence of algorithms are part of a cultural change that has promoted high-tech journalism (Salaverría, 2014), which we must take advantage of to improve news quality and to curb the development of fake news on the Web (Rodríguez-Pérez et al., 2022), which are a major threat to organizations such as the European Union.

Flores (2020) states that these disruptive technologies presented from Europe arrive as possible solutions to misinformation thanks to data. Therefore, new applications will probably be launched from the communication area to improve the fact checker.

2. Objectives and methodology

The main objective of this essay-type study is to provide an updated overview of the meaning of misinformation, Big Data and Artificial Intelligence. In addition, and as a secondary objective, we propose to review some recently published studies on this phenomenon and some of the projects led by the European Union to disarm disinformation and hoaxes using the aforementioned technologies.

In order to achieve the main objective, a qualitative bibliographic documentary study on disinformation, Big Data and Artificial Intelligence is proposed. To carry it out, a search has been made in the Scopus and Web of Sciense databases because they are recognized for their high level of quality. Among the results, the most recent and useful texts have been selected to respond to the main objective set by the authors. Likewise, for the secondary objectives, a qualitative analysis focused on the observation of the initiatives and projects presented by the European Union. To locate these projects, the official website of the European Union (https://bit.ly/45O8pw5) was consulted. Therefore, in this study we will combine the qualitative documentary bibliographic study and participant observation of the projects, initiatives and intentions of the European Union in this regard, the latter being understood as the concrete vision "that enables the researcher to learn about an activity in the natural setting where it takes place" (Kawulich, 2005). The review of the projects has made it possible to suggest a series of measures to put an end to misinformation.

3. Disinformation

We set out as our main objective in this research to provide an up-to-date overview of the meaning of disinformation, Big Data and AI. In relation to disinformation, it is worth starting by noting that the term hoax is occasionally used in reference to

rumors and urban legends, but folklorist Jan Harold Brunvand argues that most of these lack evidence of deliberate creations of falsehood and are passed on by believers in good faith or as hoaxes, so the term should be used only for those with a likely conscious intent to deceive (Brunvand, 2001). Therefore, the distinction between deception and fraud is not necessarily clear (Walsh, 2006; Cárdenas-Rica et al., 2022).

Alex Boese, the creator of the Museum of Hoaxes, states that the only distinction between them is the public's reaction, because a fraud can be classified as a hoax when its method of obtaining financial gain creates a broad public impact or captures the imagination of the masses (Boese, 2008).

The Dictionary of the Royal Spanish Academy considers the word "disinform" as "information manipulated with intent in the service of spurious interests and also, offering insufficient information or omitting it" (Dictionary of the Royal Spanish Academy, 2022).

This word, which comes from the secret services, has a Soviet origin "dezinformatsia", and was spread through the French. In 1952, the Soviet Encyclopedia explained "disinformation as the propagation of false information to create confusion in public opinion, or as the dissemination in bourgeois countries of misleading or distorted news, used profusely as a means of political propaganda in order to create confusion in public opinion" (Soviet Encyclopedia, 1952).

Jacquard and Fraguas (1988) place "dezinformatsia" at the end of World War I and affirm that it is a concept introduced in France by immigrants from the USSR, who reported that the police used this word to denounce internal or external actions that tried to hinder the consolidation of the new regime".

In all definitions, the term disinformation is presented as "conscious deceptions with a manipulated intention", states Moreno Espinosa (1995). Since then, disinformation has evolved with the political-social context.

Tuñón (2021) states that "today it is something much more complex, subtle and with a greater collective risk than fake news, propaganda or mere lies. Although we cannot innocently think that the existence of fake news is a novelty, it is necessary to recognize that it has acquired a new dimension with the irruption of ICTs".

The European Union describes disinformation as "verifiably false or misleading information which is created, presented and disseminated for profit or to deliberately mislead the public, and which is likely to cause public nuisance".

According to the Eurobarometer published by the European Union (EU), corresponding to winter 2021-2022, 78% of European citizens believe that disinformation is a problem and 70% state that they often come across news that, in their opinion, distorts reality or is false. Generalist studies related to disinformation in the European Union are not too many, despite having gone through particularly complicated contexts in this regard, such as the process of European integration since the beginning of the century, the Euro, refugees, populisms, Brexit and the recent global pandemic of Covid-19.

The Government of Spain (n. d.) states that disinformation is not limited to the dissemination of false content, but usually aims to build a malicious discourse. For this reason there is a remarkable link between the fight against disinformation, strategic communication, public diplomacy and digital communication.

Following events such as the Brexit, which put on the agenda a heated debate on the mediatization of disinformation in the results, the EU took the decision to provide a new approach to this new information context. It has been important in recent times to identify the different acts of the process in order to be able to raise possible collective responses to this phenomenon.

To this end, it decided to hold a public consultation to record the views of the major stakeholders. The procedure concluded with some meetings of specialists, certain public events and a final balance with an overall report.

From the questions carried out in order to understand all that is involved in disinformation, it is worth noting that the EU already drew a picture of interested and intentional disinformation and made distinctions between different subjects and problems as follows: immigration, security, economics, public opinion, politics and the media, as well as the media.

It was also interested in the disinformation expansion systems with the greatest impact and offered the possibility of selecting between public figures, influencers, etc., profiles present in social networks, algorithms, etc. Therefore, mass-media were included in the report on the different types of disinformation.

4. Big Data and Artificial Intelligence

Nowadays, "aspects such as digital literacy, national security measures, Big Data and artificial intelligence" (Cotino, 2017), "the limitation of freedom of expression, the regulation of journalistic discourse or transparency in institutional advertising converge in common territory of legislation related to disinformation" (Robles, 2018), although we will focus on Big Data and AI.

"Big Data is a term applied to data sets that exceed the capacity of usual software to be captured, managed and processed in a reasonable time" (Mayer-Schonberger and Cukier, 2013).

It is also a Big Data technology that arises from the rapid development of communication and computer technology, which is likewise causing the paradigm of human cognition about our reality to be altered. Digital and intelligent computing technology is well advanced in the stages of data sampling, storage management, data computation and data communication. Anything can be digitized and defined with software. One of the advantages of Big data is that it helps in scientific discovery through computer simulation (Shu, 2016).

For its part, the arrival of Artificial Intelligence has surprised many, who without having all the scientific knowledge at hand about this new application, are just waiting to see what changes they will undergo. Until now, the most popular thing about AI was GPS, which we have incorporated as a location and search tool and makes our lives easier, although we are not aware that the greater the use of technology, the more the use of the brain is reduced.

Artificial intelligence or AI is a subject that is part of computer science, which, based on the biological neural networks of the human being, exposes computational models of learning. In this regard, various AI models have been proposed, and thanks to the development of computational technology have allowed numerous advances in "intelligent" systems that help to work with a very large amount of data in a very short space of time, accelerating the decisions that can be taken.

Artificial intelligence has made significant advances in health, medicine, the military, aerospace, computing, communications, industry and similar fields. In addition, it has made great progress and gained momentum in education (Nalbant, 2021).

Bill Gates (2023) believes that the advancement of artificial intelligence is as imperative as the development of the personal computer, cell phone or internet that will change the way citizens work, learn, travel, receive health care and communicate with each other. He also accepts that artificial intelligence, without ruling out that it also makes factual errors and experiences "hallucinations," raises complicated questions about the legal system, the labor market, privacy and the prejudices of many subjects.

AI encompasses different areas, such as speech recognition, natural language processing, computer vision, advanced robotics, knowledge capture, planning and optimization, among others. The system is intended to have the ability to sense, reason, participate and learn. Additionally, in relation to these areas.

Magallón Rosa (2019) states that there are also other specialties such as machine learning, which involves different types of neural networks coded under reinforced learning, supervised learning, unsupervised learning and semi-supervised learning. With these specialties it is possible to optimize models and process massive information through Big Data and Clusters through the use of regression, classification and clustering algorithms.

Deep Learning is another subject or sub-area of AI for certain data such as image, video and audio using convolutional neural networks with their variations and memory neural networks. It also enables the simulation of dynamic systems through the use of reinforcement learning (Márquez Díaz, 2020).

Given its transcendence, we have also considered it important to highlight the recent arrival of GPT chat systems, which were unveiled in November 2022. GPT chat is named after the acronym for Generative Pretrained Transformer. This tool is a prototype AI chatbot developed OpenAI that focuses on dialogue. Specifically, the chatbot is a large language model, tuned with supervised learning and reinforcement techniques (Olite et al., 2023).

Such a system is based on the work of real people, such as artists, musicians, etc. However, the greatest danger of this prototype is the confusion that it generates that artificial intelligence can replace.

The speed of the irruption of artificial intelligence has led a large group of experts in artificial intelligence to express their concern and call for a pause in the development of this technology to study the analysis of its side effects. Among the signatories is Elon Musk, founder of Tesla and owner of Twitter, and one of the founders of OpenIA, the company that developed ChatGPT (Pascual, 2023).

In agreement with Sádaba and Salaverría (2023), it can be affirmed that the EU is consolidating a pattern of fight against disinformation based on a set of proposals comprising political, legislative, market, technological, educational and media actions.

5. Previous studies

In response to the first secondary objective we set ourselves, this section presents some important and recent works related to the digital medium and misinformation. First, the study by Hameleers et al. (2020), entitled One picture paints a thousand lies? The effects and mechanisms of multimodal disinformation and rebuttals disseminated through social networks on digital and fragmented media, which were considered a fertile ground for the uncontrolled spread of disinformation. In this

research, an online experiment was conducted with a diverse sample of 1404 U.S. citizens to investigate the reliability of textual versus multimedia (text plus visual) disinformation, and the effect of fact-checking tools. Textual and multimedia refutation of misinformation about school shootings and refugees. Their findings point out that, regardless of the source, multimedia disinformation is slightly more credible than textual disinformation. Fact-checkers can help overcome the potentially harmful consequences of misinformation. It also finds that fact-checkers can overcome partisan and situational filters, suggesting the importance of fact-checking as a journalistic discipline.

It is followed by a study by Francis Taylor (2022) on liquid disinformation tactics: overcoming social media countermeasures through misleading content. This analysis addresses the formats and dissemination of disinformation during the 2018 Brazilian elections on social networks, taking into account the countermeasures that platforms adopted at the time to reduce its circulation. Disinformation occupies a central space in the public debate in Brazil, where there is an intensive use of social networks. Based on a content analysis of 153 false or misleading narratives that were widely shared during the course of the campaign, the results show that the contents changed format to overcome the countermeasures of the platforms. The findings also highlight the majority of images and a mix of misinformation and nuance that reshape the definition of the phenomenon and point to the ineffectiveness of current systems. It also finds that social networks have brought about profound changes in the media ecosystem and new communication dynamics. It concludes that the platforms have become competitive sources of information and have played a key role in facilitating the dissemination of false or misleading content, with particular impact in the last elections in Brazil.

Another interesting study in this regard is by Abu Zaid and Al-Shura (2022). Artificial intelligence and the quality of governance. This study aims to identify the role of artificial intelligence technologies in improving the quality of governance, and seeks to investigate the possibility of linking artificial intelligence technologies based on information and communication technology, political science and public policy. In this context, the main research question arises: How do artificial intelligence technologies affect the quality of governance? To answer this question, the study indicates that artificial intelligence technologies affect the quality of governance through two dimensions: the first dimension is the impact on the different stages of the public policy formulation cycle, while the second dimension focuses on improving the quality of government services and the efficiency of the administrative apparatus. In addition, the study addresses the challenges posed by artificial intelligence technologies to government decision makers. Hence, the study is divided into three axes: the first deals with the conceptual framework (what is artificial intelligence in terms of its origin, concept and position in the definition of quality of governance). While the second axis focuses on how to use and employ artificial intelligence techniques in the state policy formulation cycle and the extent of its reflection in the quality of government services, the study concludes with the unknowns that artificial intelligence poses to government decision makers.

Similarly, Taeihagh (2021), in his paper entitled Governance of Artificial Intelligence, describes "rapid developments in artificial intelligence and the intensifying adoption of the tool in domains such as autonomous vehicles, lethal weapon systems, robotics, and the like pose serious challenges for governments as they must manage the scale and speed of the sociotechnical transitions that occur.

New applications of AI offer opportunities to increase economic efficiency and quality of life, but they also generate unexpected and unintended consequences and pose new forms of risks that must be addressed. "While a considerable amount of literature is emerging on various aspects of AI, AI governance is a significantly underdeveloped area. To enhance the benefits of AI and minimize the adverse risks, governments around the world must better understand the scope and depth of the risks posed and develop regulatory and governance processes and structures to address these challenges.

This article introduces and breaks down AI, while describing why AI Governance should receive much more attention given the myriad of challenges it presents. It then summarizes the articles in the special issue and highlights their key contributions. This special issue presents the multifaceted challenges of AI Governance, including emerging governance approaches for AI, developing policy capabilities, exploring the legal and regulatory challenges of AI and robotics, and outstanding issues and gaps that require attention. The special issue showcases the state of the art in AI governance, with the aim of enabling researchers and practitioners to appreciate the challenges and complexities of AI governance and highlight future avenues of exploration.

Finally, a study entitled Combating fake news, disinformation, and misinformation: experimental evidence for media literacy education (Dame Adjin-Tettey, 2022), which investigated the effect of media and communication literacy on the ability to identify fake news, disinformation, and intent to share, has been considered. The experimental approach was chosen to study the control group and the experimental group consisting of a total of 187 respondents. Comparative analysis of the two groups showed that although more respondents in the experimental group were able to identify the incorrectness of the information provided to them, some respondents in the control group were also able to do the same, although they did not receive MIL. Conversely, some of the respondents in the experimental group, despite being trained in media and information literacy, were unable to identify the incorrectness of the information.

6. Proposals from Europe

In relation to the second secondary objective of this essay, it is pertinent to begin by pointing out that the European Union has been aware for years that disinformation is one of the greatest dangers for democratic countries and that it can damage their stability and institutions. For this reason, from its Horizon 2020 research and innovation program, it is devoting a large amount of resources to put an end to the disinformation that is spread on social networks on the Internet and in certain media. An example of this is the launch of the Social Observatory for the Analysis of Information and Social Media (SOMA), along with other EU-funded projects such as PROVENANCE, SocialTruth, EUNOMIA, WeVerify, which allows social networks to present their dynamics, relationships with other sectors and their linkages.

For example, SOMA has compiled a large number of analyses and resources, etc., in relation to the information infodemic during the coronavirus pandemic stage and the competencies related to the disinformation that has been recorded in Europe in recent times.

The Observatory has put forward interesting proposals for the objective set by the Union, such as the launching of a platform for checking information, a data verification tool, a method for assessing the social and economic impact of the phenomenon

of disinformation, and measures for progressing in communication literacy, studying the many legal drawbacks and aspects of the self-regulation community and a catalog of competencies linked to false or incomplete information, among others.

6.1. Fake News and Digital Disinformation

The EU requested a report in 2018 from a group of specialists on 'Fake News and Digital Disinformation'. This report made it known that the pillars to work on against disinformation were as follows. Progress in the rigorousness of networked news, research on media and information literacy, activate mechanisms to consider users and journalists, protect the sustainability and diversity of the media in Europe and encourage specific studies on the impact of disinformation in Europe.

The document also called for identifying and mapping the sources of disinformation, as well as the levers promoting its digital expansion. Furthermore, with the idea of providing a stable space to give access and be able to analyze platforms, tools and information to improve the understanding of how the algorithm of the networks works. The importance of sharing knowledge with media and platforms to advance society's awareness of this phenomenon was also emphasized.6.2. 2018 Code of Best Practices

6.2. 2018 Code of Best Practices

The European Union counted approximately around 18 electoral processes, in which, disinformation and manipulation within the European Union had been present. Aware of the problem of disinformation for citizens and for the institution itself, it called in 2018 for the advertising industry, online platforms, communicators, fact-checkers, mass-media organizations (press, radio and television, etc.) and independent content creators to make a commitment to a Code of Good Practice to curb this trend.

In order to respond to this problem, the Commission proposed a series of proposals to prevent disinformation on the Internet. These proposals included the following: create a Code of Best Practice on disinformation, an independent network of information verifiers within the EU, a secure internet platform to support the network of information verifiers and academic researchers, strengthen media literacy, defend European states to consolidate resilience in terms of politics and electoral campaigns, work to promote the traceability of data and identify content and information providers, as well as protect "plural and quality information and a coordinated policy of strategic communication", as Magallón Rosa (2019) collects in his analysis entitled: "The (non)regulation of disinformation in the European Union. A comparative perspective".

The signatories of this Code committed to take action in several areas: suppress advertising revenue from accounts that use disinformation, suppress political advertising that is not transparent, address the issue of online bots, encourage consumers to dare to report disinformation and have free access to news sources, and encourage researchers to monitor online disinformation through compatible access to data from platforms.

6.3. FactCheckEU

In December 2018, the EU presented an action plan to combat disinformation in Europe and outside the EU, incentivizing efforts. To this end, it was envisaged to provide endowment to the Hybrid Threat Fusion Cell of the European External Action

Service (EEAS) –and also to EU delegations in neighboring countries– and the Strategic Communication Task Force with highly innovative analysis tools.

It also envisaged doubling the EEAS's strategic communication budget for combating disinformation and building opinion on its effects –the budget would increase from €1.9 million in 2018 to €5 million in 2019– and encouraged EU member states to redouble their own means to fight disinformation.

On the other hand, the early warning system was urged to be operational as early as March 2019 considering the call for European elections in May 2019.

In May 2019, the launch of FactCheckEU, a collaborative project between the European signatories of the code of principles of the International Information Verification Network, was reported in May 2019.

6.4. Horizon 2020 FANDANGO

The Horizon 2020 program, the largest research and innovation program in the EU, had a budget of almost €80 billion for the period 2014-2020, was. The fundamental objective has been to ensure the overall competitiveness of the European Union.

One of its programs more has focused on fake news, because of the importance of the subject and the consequences, especially in terms of social and political challenges. This initiative was clear that the EU does not have a systematic transfer of knowledge and data between its organizations and institutions to counter disinformation and the post-truth effect.

FANDANGO proposes to use cross-sectoral Big Data research and study, as well as an effective operability scheme for data sources, to address such juncture urgently, generating new realities involving media companies and governmental institutions and organizations. The aim of the project is to aggregate and verify different typologies of news data, in order to detect misinformation and achieve a verified communication for the whole European population.

The FANDANGO project aimed to develop proprietary techniques and a Big Data platform in order to support the old media industries to face the new situation with better and more rigorous information for the citizenship under the prism of Commitment, Responsibility and Competence.

The objective focused on three specific domains: climate, immigration and European context. These are typical scenarios where fake news can influence perception regarding social and business actions and where news can be verified by reliable information, based on real facts and hard data.

6.5. Iberifier

Promoted by the European Commission and linked to the European Digital Media Observatory (EDMO), the Iberifier project stands out in southern Europe, with the main objective of examining the Spanish and Portuguese digital media ecosystem to address the problem of disinformation.

Iberifier works as a tool in the form of a digital media observatory in both countries. It is coordinated from the University of Navarra by Professor Ramón Salaverría and integrated by eleven other universities, five verification organizations and news agencies, and six multidisciplinary research centers.

Its purposes are to investigate the characteristics and trends of digital media, develop computational technologies for the early detection of disinformation, verify disinformation in the Iberian ecosystem, carry out strategic reports on disinformation threats, both for public knowledge and for the authorities in Spain and Portugal, and promote media literacy initiatives aimed at journalists and reporters, young people and society as a whole.

The project has verified more than 1,700 disinformations since 2021 (Peña, 2023), investigated by the verifiers and media that make up this observatory, with the aim of analyzing in detail the impact of falsehoods in Spain and Portugal.

Iberifier presented in June 2023 its latest report on the impact of disinformation in Spain and Portugal. It shows that, out of more than 1,700 disinformation verified by the observatory since October 2021, 50% is about politics and 20% of that 50 is focused on electoral processes. Likewise, 10% of the total corresponds to Ukraine. Other recurring topics are climate change, migration issues, gender issues or issues related to cybersecurity.

7. Conclusions

Our study, which tries to link Big Data and Artificial Intelligence as solutions to misleading information, differs from previous studies in the possibility, timing, direction and difference of the sample, and has allowed us to link the large amount of information that exists with an attempt to find out the seriousness of this data, especially the misinformation spread on social networking sites.

For its part, the EU has been aware for years of the problem of fakes news and is concerned about the rise of disinformation in the Community and in the world. For this reason, it is dedicating a significant part of its resources and personnel to identify the problem and propose solutions with the FactCheckEU or FANDANGO projects, among others.

Social media disinformation campaigns are part of life online and identify these threats amidst the posts uploaded by billions of social media users every day. To help sort through large amounts of data, social media platforms are developing AI systems to automatically remove malicious content through text-based analysis. However, these methods will not identify all false information on social networks. It can be stated that much of what people post are photos, videos and audios, so, in common with a study by (Yankoski et al., 2021), it can be concluded that it is difficult and great challenge to develop the new AI systems needed to detect such multimedia misinformation.

On the other hand, fake news does not spread unless people do, therefore, people are the important factor in limiting the spread of disinformation. There is no doubt that AI can help limit the spread of disinformation. This is why organizations and institutions are focused on curbing fake news on the web. One can thus see the importance of data through the use of AI to find solutions to the phenomenon of disinformation.

In this line, some positive, negative aspects and suggestions are mentioned in terms of the object of study addressed. As positive aspects, it is underlined that artificial intelligence uses and filters Big Data in record time for the benefit of all competent authorities; creates software that reduces disinformation using special algorithms; helps many large social networking companies such as Facebook and Twitter to eliminate thousands of fake accounts and misleading information on a daily basis; it involves humans in the process of distinguishing misleading data from true data; it enters most areas of life in its various

sectors, and this constitutes a kind of intensification of efforts against misinformation; it works to reduce electronic theft or hacking of private and government institutions; and it helps in the marketing process to provide the user with the right needs and saves them effort and time.

As for the negative aspects, it is worth remarking that Big Data poses a threat to humans if used in a way that violates user privacy; it poses a danger to humans if they rely primarily on it, since in the end they are just algorithms, but they develop on their own, and here lies the greatest danger; some companies violate user privacy by tracking calls, locations and personal data; hacking operations can occur for personal accounts, private and government institutions; and artificial intelligence programs can be designed to steal or disseminate misleading information and many risks.

It is of interest to suggest five of measures that can limit the spread of false information, as follows:

1. Government cooperation with social networking sites through cybercrime departments.

2. The presence of an office that includes representatives of the country's social networking sites to coordinate with each other, because misleading information can spread from anywhere in the world.

3. Conducting educational workshops and seminars in schools and universities to show the seriousness of misleading data.

4. Existence of dissuasive sanctions for publishers of misleading information by making them judicially responsible.

5. Developing scientific disciplines specialized in combating misleading information according to the scientific standards and foundations studied.

This qualitative documentary bibliographic study has some limitations, beyond offering a general overview from Europe of the use of Big Data and AI to try to counteract the phenomenon of misinformation. However, the objective of this essay was precisely to map terminologies, some recent work and some of the interesting initiatives being implemented by the European Union to tackle the problem.

8. Acknowledgments

9. Specific contributions of each author

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Drafting, formatting, review, and approval of versions	Pastora Moreno Espinosa

10. Conflict of interest

The authors declares that there is no conflict of interest contained in this article.

11. Bibliographic references

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