Vol. 6, Num. 1. **Article n.º 220**
DOI: https://doi.org/10.35951/v6i1.220

C&M Communication & Methods

Research Methodologies and Uses of Artificial Intelligence Applied to Journalism

Metodologías de investigación y usos de la inteligencia artificial aplicada al periodismo

Juan Pablo Mateos Abarca. Complutense University of Madrid (Spain)

Professor and university researcher specialized in Information Technologies. He holds a PhD in Information Enterprise, sub-branch "Entrepreneurship and Innovation" and a Master's Degree in Digital Journalism. He holds a degree in Information Sciences from the UCM and is currently a professor of Multimedia in the Department of Journalism and New Media. ORCID: https://orcid.org/0000-0002-8449-0072

Roberto Gamonal Arroyo. Complutense University of Madrid (Spain)

Professor and university researcher specialized in Typography and Information Design. He holds a PhD in Applied Creativity and a Master's Degree in Design from the Faculty of Fine Arts at the UCM. He holds a degree in Information Sciences from the UCM and is currently Director of the Department of Journalism and New Media.
ORCID: https://orcid.org/0000-0002-4193-9845

Article received: 13/05/2024 – Accepted: 15/06/2024

Summary:
Artificial intelligence (AI) is revolutionizing various fields, including journalism. More and more news organizations are using AI to improve their content production and distribution processes. This has led to a change in the way news are generated and consumed. As an innovative technology, AI has multiple uses as a tool for media work. The methodologies of analysis of these new technologies are a starting point that allows for an adequate investigation of the object of study to be analysed; therefore, a review of these methodologies is necessary. In this paper we will explore which methodologies are valid for analysing this reality and how artificial intelligence is applied to journalism, transforming the way in which content is produced and distributed. Likewise, the capabilities of this technology allows a range of functionalities that helps journalists to carry out their work. The study of these capabilities and their limitations is considered appropriate to understand the methodologies that can be used in this innovative area of knowledge.

Keywords:
artificial intelligence; digital journalism; cyberjournalism; cybermedia; AI.

Resumen:
La inteligencia artificial (IA) está revolucionando diversos campos, incluido el periodismo. Cada vez más empresas informativas están utilizando la IA para mejorar sus procesos de producción y distribución de contenido. Esto ha llevado a un cambio en la forma en que se generan y consumen las noticias. Como tecnología innovadora, la IA tiene múltiples usos como herramienta de trabajo en los medios de comunicación. Las metodologías de análisis de estas nuevas tecnologías son un punto de partida que permite abordar una investigación adecuada del objeto de estudio que se pretende analizar; por ello, una revisión de estas metodologías se observa necesaria. En este trabajo exploraremos qué metodologías son válidas para analizar esta realidad y cómo la inteligencia artificial se aplica al periodismo, transformando la forma en que se producen y distribuyen los contenidos. Así mismo, las capacidades de dicha tecnología permiten un abanico de funcionalidades que ayudan al periodista a realizar su labor. El estudio de estas capacidades y sus limitaciones es considerado oportuno para entender las metodologías susceptibles de uso sobre esta innovadora área de conocimiento.

Palabras clave:
inteligencia artificial; periodismo digital; ciberperiodismo; cibermedios; IA

1. Introduction

This paper analyses various methodologies applicable to the field of artificial intelligence used in journalism. In addition, it discusses the benefits and challenges that arise with the implementation of AI in the field of information technology, based on the various functionalities that AI allows in the journalism sector. A descriptive, exploratory, and analytical analysis is carried out, dividing the work into two sections: on one hand,various scientific methodologies applicable to the study of artificial intelligence in the communication sciences are presented and described, with studies and academic reasoning by researchers. The aim is to provide a clear and objective view, from an epistemological point of view, on the impact of artificial intelligence in this constantly evolving industry. On the other hand, the impact of artificial intelligence on journalistic work is explored through the approaches of researchers in the sector and the applications and capabilities of this technology.

The use of artificial intelligence and its application to journalism reveals a tension between the industry and the profession of journalism, highlighting the great opportunities for improvement in the efficiency of news production and distribution, but also the threat of its use to displace quality journalism with machine-generated "rehashes". Morant and Shaikh's 2022 study, which conducts a thematic analysis of media coverage of AI in relation to its use and application in journalism, reveals discrepancies between the industry and the journalism profession by highlighting the hopes, understood as efficiency, speed and capacity, and the dangers of AI, including a

decline in the quality of content and the emergence of better fake news with a higher risk of virality.

Likewise, the methodological options for analysis when approaching research on AI and journalism are shown and described as a starting point for academic reflection on this subject. In summary, the objectives of this work are as follows:

O.1 To analyse the various methodologies for the study of artificial intelligence applied to journalism.
O.2 To define which information analysis methodologies may be appropriate for the study of artificial intelligence applied to the use and development of information and messages generated by journalism.
O.3 To observe the possibilities offered by this technology to communication professionals and its advantages and potential disadvantages.

2. Descriptive and referential theoretical framework

It is necessary to highlight that technological advances have allowed the automation of tasks related to news production, which poses important ethical and professional challenges. In the same vein, it is very interesting to see how journalists who left university years ago - many of whom are now in senior positions - are adapting to working environments in which the weight of technology is infinitely greater than it was at the beginning of this century. This process of adaptation, with the consequent tension between journalists and technologists, has already been experienced during the processes of digitalization of newsrooms and the emergence of social networks. It is therefore foreseeable that something similar will happen now with the rise of artificial intelligence (Parrat_Fernández et al., 2021). From this starting point, any approach related to the use of AI in journalism pivots around three axes: automation, ethics and the journalist-machine tandem in the development of the journalistic profession.

When talking about news verification, the quality and veracity of the information must always be guaranteed by professionals when using artificial intelligence, a tool that allows analysing large volumes of data and generating news automatically (Moreno-Gil, et al., 2023). This approach is endorsed by other research, which considers that AI applied to journalism can be an efficient solution to speed up news production, especially in cases of real-time events or complex data coverage. However, it is essential to maintain journalistic ethics and responsibility in its implementation (Salaverría and Sádaba, 2023).

In relation to both statements, it can be observed that the current use of AI-generated information is more a trend aimed at reducing the work of the news staff than an approach of real practical utility. Undoubtedly, by reducing us to the use of automatism we are rethinking a contrived, not just artificial, editorial scenario, in which information becomes a bargaining chip for human capital, not a genuine tool of use for journalists.

The ethics of the use of artificial intelligence tools in journalism, in our opinion, lies not only in the technological use of data, abstracted in a technical reality that is shown as a mere information bridge with the reader. The editorial reality requires a journalistic

evolution that combines the documentary and editorial use of artificial intelligence with an approach based on constant human monitoring and supervision, which allows new ways of communicating more effectively without compromising the quality of the content to be generated. The journalist's main task is to inform and interpret the reality of the facts; anything that moves away from this is "canned" journalism that can be efficient, but not effective.

These assertions are supported by other research, which suggests that artificial journalism should be promoted as a suitable solution for journalists to carry out their work with greater agility. Likewise, it is considered necessary to point out that, although AI-based journalism cannot replace journalists, it can be of great help for them to carry out their tasks more productively and focus on more creative and analytical tasks (Sánchez Holgado, et al., 2022).

The speed of news production is considered to increase exponentially with the use of Artificial Intelligence systems. The creation of headlines, headlines and even the re-editing of texts with some editorial tools, for example, Editmaker, from Cibeles Group L.L.C (Editmaker, 2024), a Spanish digital editorial software company, shows that these trained tools increase the speed with the use of generative artificial intelligence applications. Likewise, all that time "saved" in the tasks of re-editing press releases, creating headlines, tables, editorial chronology and editing headlines or summaries, can be used for investigative journalism, the search for new business models, the creation of new categories of content or human interaction with the reader, giving rise to new channels, platforms, and systems of connection with the user.

On the other hand, new ethical and legal challenges arise with the use of AI in journalism. These include the control and tracking of automatically generated news sources and the right to privacy (De Lara, et al., 2022). The claim to obtain the origin of content developed by artificial intelligence, by means of content creation and generative content development tools, is, to some extent, a futile goal. The data obtained by this technology is part of a linguistic combination of texts included in millions of different web pages, all of them open to the public. Privacy, in this way, becomes a diffuse web of phrases generated with a dialectic that appears to be human, but whose origin is difficult to trace. This reality is what produces an ambiguous ethical and legal scenario, insofar as all content generated by artificial intelligence, based on multiple sources, does not allow for a concrete ascription of its contents. In the future, it will be the legal sciences that will ultimately determine the legal reality of these texts (this also applies to images, audio, and video).

AI offers many possibilities in news development, but to properly implement and exploit AI-based journalism, specific training is required. Journalists must acquire technical skills and knowledge about artificial intelligence to use this tool effectively. This approach arises with the aim of addressing reasons,source of interest and concerns regarding the new technological actor that is on the horizon in media newsrooms: artificial intelligence (Lopezosa, et al., 2017).

Industry has undergone a development thanks to new technologies, moving from version 1.0 to the current version, known as industry 4.0. The latter is characterized by

the penetration of artificial intelligence and its various technologies, which promise to surprise and transform the market and the world in general. In this sense, many technologies are closely related to intelligent automation, which projects a large-scale transformation (Valdiviezo-Abad and Bonini, 2019). In this transformation must, in our view, separate own creation (exclusives), from machine creation.

In recent years, there has been a significant increase in research on the use of Artificial Intelligence in the field of journalism. These studies focus on a wide range of topics: news production, data-driven journalism, big data analysis, implementation in social networks and information verification (Calvo and Ufarte, 2020). Likewise, there has been a growing interest in the impact of artificial intelligence on the communication industries. Literature and research has mainly focused on sectors related to the production or distribution of various forms of content (Martínez et al., 2022).

We start from the idea that ignoring the changes taking place is a mistake. Feeling isolated from technology will not prevent the coming technological earthquake, and looking the other way will not stop it. This applies to both media and other publishing products (Bhaskar and Rocca, 2021).

Nowadays, not only texts are created based on data, but also computer programs are developed with the ability to interpret this data. This allows the machine to relate, propose and create a story. The current trend is for algorithms to generate short descriptive texts that can be published, as well as more elaborate proposals that serve as the basis for the journalist's final, personal touch. Moreover, work is being done on the possibility of generating audiovisual pieces based on the recognition of images and feelings (Túñez and Tejedor, 2019).

Society is increasingly being invaded by AI. While it was previously only used in certain areas, its use has now become widespread and accompanies us daily, even in our personal devices such as mobile phones. However, there is a lack of literature addressing the impacts of AI on society, as most studies focus more on computing aspects. Therefore, it is important to conduct research such as this to analyse how journalism is employing artificial intelligence.

Moreover, the application of artificial intelligence in Spanish journalism is a promising tool to improve efficiency and accuracy in news generation. Artificial intelligence has become an effective platform for improving journalistic processes in Spain, allowing for the optimization of data generation, collection, and analysis, which in turn has improved the quality and relevance of news (Canavilhas, 2022).

Given that the development of systems capable of analysing large amounts of data and generating accurate and relevant reports for journalists has been boosted, thus facilitating their work in the search for sources and the verification of information, artificial intelligence is considered an ally in the fight against disinformation, from three aspects: 1) Professional journalism can experience a significant improvement in its status, 2) Privacy is a fundamental aspect that must be properly managed and 3) Contributing to technological development with an ethical approach is fundamental to

ensure that informative decisions are conscious and free of bias (Manfredi Sánchez et al. , 2020).

The application of artificial intelligence (AI) in journalism is developing and has a significant impact on the model of journalistic production and dissemination. This raises several ethical challenges. In this regard, it is essential that the media use AI in a responsible manner, and transparency plays a key role in this regard. One way to promote transparency is through the commitment of verification platforms to describe their professional methodology. This makes it possible to know how they use data, algorithms, and automations, generating trust in their use (Sanahuja-Sanahuja, and López-Rabadán, 2022).

However, the chronicles produced by artificial intelligence do not represent a quality contribution to the journalistic genre, lacking an analytical or interpretative character; in both cases these are qualities traditionally present in journalism. Therefore, it is necessary to note that the human professional is an inherent part of the development of the informative message (Murcia Verdú et al., 2022).

On the other hand, it is important to recognize that the advance of AI and its implementation in the journalistic field is transforming the way in which news are produced, distributed and consumed. Therefore, it is essential for communication professionals to adapt to these changes to face the challenges and take advantage of the opportunities that arise with these technologies (Gómez-Diago, 2022).

An analysis of how these systems work and the value of information is needed so that they can learn with the help of humans. Some authors consider that there is no real danger of extinction of the profession, but rather a process of changes and adjustments in which machines become proactive actors. Journalists should emphasize their personal contribution and the cognitive part in news production (Ufarte and Manfredi, 2019).

Finally, other authors consider it necessary to adapt automated journalism to the FAPE Code of Ethics, as a fundamental change to review aspects such as authorship, elaboration, transparency and hierarchization of information written by artificial intelligence (Ufarte et al., 2021).

3. Methodologies applicable to AI research in journalism

Artificial intelligence in journalism has been in common use since the advent of "democratized" AI systems (so understood from the use of open AI systems by a large part of society, see GPT Chat). Given that this type of software (Open AI and BARD), which is easy to use thanks to natural language, is already integrated into publishing groups. It is therefore necessary to look at the essential aspects of advanced "digital thinking" systems in editorial departments.

An analytical, exploratory, and descriptive methodology, which converges key concepts to understand the use of AI in editorial departments and aims to understand this phenomenon, is the specific methodology used in this article.

However, in terms of possible research methodologies that lead to a basis of development in accordance with the object of study analysed - artificial intelligence applied to journalism - various methods of analysis could be used that result in elements of value in relation to the different possible perspectives. This is why it is necessary to mention methodological options in an innovative field of study, which can give rise to multiple derivations of observation.

Among these applicable methodologies, the following can be described:

3.1 Analytical, exploratory, and descriptive methodology

Exploratory type methodology focuses on understanding and describing how AI is used in journalism. It examines case studies, identifies patterns and assesses the impact of AI on news production. This type of methodology aims to provide a rough overview of an under-explored or under-recognized topic. This methodology is used when there is limited knowledge on the topic. Among its various perspectives, it can be quantitative, qualitative, or historical.

Exploratory research aims to gather information, identify general background information, and locate relevant aspects without offering explanations about the object of study. It focuses on identifying trends and possible relationships between variables that will be analysed in future research. In summary, exploratory research is carried out when it deals with a topic or object that is little known or for which insufficient information is available, providing a superficial view of it. Similarly, exploratory research seeks to obtain a rough overview of the topic in question (Pearson, 2014).

Undoubtedly, there is no recent history of artificial intelligence systems applied to the Social Sciences, which is why current scientific articles or current books are a reference for this research method. This methodology helps to establish priorities and determine trends, as in the article in question. In this methodology, situations are related where it is necessary to accumulate ideas on different aspects that have not been studied much. The researcher must immerse him/herself in the data, ideas and content and can use small, non-representative samples. In short, the aim is to represent the current state of a fact or phenomenon.

Descriptive Methodology, on the other hand, applied to the topic at hand, aims to describe fundamental characteristics of homogeneous sets of phenomena. It is also used for frequencies, averages, and other statistical calculations. It allows, thanks to this, to obtain notes that characterize the studied reality. It is not an in-depth study, but a representation of the current state.

Finally, the analytical methodology aims to interpret and understand specific phenomena in depth. Among its main premises are a thorough exploration and analysis combined with quantitative and qualitative approaches. However, this methodology requires abstraction and generalization from observations.

3.2 Methodology based on the democratization of AI

The democratization of artificial intelligence (AI) refers to the opening and wider access to AI capabilities, allowing more people to benefit from them. In terms of how to apply some perspectives on this democratization in the context of investigative journalism, we can look at access to data. This juncture that implies that, thanks to democratization, data is available to all, not just to a few, facilitates analysis and improvement in the ability of artificial intelligence to process information.
At this point it is interesting to mention the Open Data initiative, which proposes global legislation to liberate knowledge from data, which benefits the advancement of artificial intelligence. In addition, Generative Artificial Intelligence, as part of democratization, does not require advanced technical skills. It is accessible to more people and can be applied in qualitative and quantitative research. In terms of transparency and reasoning, artificial intelligence must be reasoned, transparent and fair. If a solution cannot explain its criteria in a piece of information, it should not be used.

Finally, personal data protection remains a challenge, but regulations such as the GDPR in Europe seek to balance privacy with access to data. As a final goal, the democratization of AI seeks to expand its use and benefits, but also requires ethical and legal considerations that can be addressed in further studies (Suazo, 2023).

3.3 Critical versus applied approach methodology

Research projects from a critical perspective consider the social consequences of AI in journalism. Applied approaches focus on training students in the use of AI in journalistic tasks, such as data processing, content automation and information verification. The Critical Approach aims to analyse artificial intelligence from a social, ethical, and political perspective. Among its characteristics, it examines the social and cultural implications of artificial intelligence, questioning bias, discrimination, and the concentration of power. Moreover, it considers how artificial intelligence affects diversity, privacy, and justice. In short, it seeks to understand power relations in the production and use of artificial intelligence. The critical approach to the consequences of the use of artificial intelligence in journalism, and its transmission to the student or practitioner, is contrasted with the applied use of such technology.

The applied approach, however, defines the analysis of the use of artificial intelligence in specific journalism tasks and its practical implementation to solve concrete problems, such as news automation or data analysis, considering practical, technical, and operational aspects. It does not address ethical issues or questions of deontological depth (Ortiz, 2015).

In short, the critical approach is concerned with the broader implications of artificial intelligence, while the applied approach focuses on its practical use in journalism. Both are important for a full understanding and artificial intelligence in this field.

4. Tools and functionalities in the use of artificial intelligence applied to communication.

Having obtained the most interesting insights into the use of Artificial Intelligence in journalism in Spain, and the feasible study methodologies for analysing "intelligent" software technologies, we can infer the issues of greatest interest in professional use, as well as the most important challenges journalists face with the use of artificial intelligence in their reporting today. These issues can be summarized in five points:

- Automated news generation.
- Technical verification of facts.
- The ability to personalize content.
- The lack of human context, which can lead to lower quality journalism.

4.1 Automatic news generation

One of the most prominent applications of AI in journalism is automatic news generation. Advances in natural language processing have enabled machines to write articles based on predefined data and patterns. This has led to a significant increase in news production, especially in areas such as financial or sports reporting.

Automatic news generation offers notable advantages, such as increased speed and efficiency in content production. Machines can analyse large volumes of data in a matter of seconds and generate accurate and consistent reports. In addition, this technology can free journalists to focus on more creative and analytical tasks.

On this point, it is interesting to note the study conducted by Mario Haim and Andreas Graefe in 2017, in which, after analysing a sample of reader readership of two news stories, one generated by a machine and the other by a human, the human-written news stories are better written, but when it comes to credibility, readers prefer the automated news stories.

4.2 Fact-checking

Fact-checking is an essential part of responsible journalism. AI has proven to be a valuable tool in this field, as it can analyse large volumes of information and detect inconsistencies or false information.

Machine learning algorithms can crawl and compare data in real time, identifying patterns and signals that could indicate the truth or falsity of a claim. This helps journalists quickly verify facts and provide accurate information to readers. AI can also help in the detection of deepfakes, content that has been digitally manipulated with the aim of misleading the public. AI systems can analyse images or videos for anomalies and signs of manipulation, allowing journalists to warn of possible deception.

Despite the obvious advantages, automated verification also presents challenges. The limited ability to understand human context and the subtleties of language can lead to

errors in detecting false information. It is therefore crucial that journalists use AI as a complementary tool and do not rely solely on it to verify facts.

It is interesting to highlight the article by Professor Jesús Flores Vivar (2019) in which he states that states, universities, and media companies invest large resources in the development of algorithms to detect manipulated news. However, this technology, which is still embryonic, needs human detectives (fact checkers) to find false information circulating on the Internet. It is along these lines that Google's artificial intelligence has been developed, whose mission is to counteract fake news.

4.3 Content personalization

Content personalization is another area where AI is impacting journalism. Intelligent algorithms can analyse user interests and behaviours to deliver news tailored to individual preferences. This allows media outlets to offer a more relevant and engaging experience for readers, increasing retention and engagement. In addition, content personalization can help journalists reach more diverse and segmented audiences.

However, personalization also raises concerns in terms of filter bubbles and algorithmic bias. If users only receive news that confirms their existing beliefs, this can limit their exposure to different perspectives and ideas. It is therefore important for news organizations to be transparent about how content is personalized and to offer options for accessing a variety of news sources. However, there are also challenges associated with this practice. The lack of human context can affect the quality of AI-generated content. In addition, there is the potential risk of algorithmic bias if not properly monitored.

Moreover, the effects derived from an automated practice without editing or publishing supervision, based on algorithmic, sensationalist approaches, can lead to the pursuit of virality over quality, with the implicit consequence of such journalistic attitudes, which put a misleading headline, in search of hits and page views, before truthful information (Túñez-López, et al., 2019).

4.4 Lack of human context as a barrier to quality journalism

The lack of human context in journalism as applied to artificial intelligence is a relevant and worrying issue. As AI is increasingly used in the field of journalism, there is a risk that the human perspective will be lost, and inaccurate or biased reporting will result. Artificial intelligence lacks the ability to fully understand the social, cultural, and emotional context surrounding a story.

Journalism has traditionally been a field based on research, fact-checking and human storytelling. Journalists have the unique ability to interact with the people involved in a story, understand their experiences and pass that information to the public. When artificial intelligence is applied to journalism, there is a risk that this crucial human interaction will be lost. Algorithms can analyse data and generate reports automatically, but they cannot capture the subtleties and nuances that can only be obtained through a conversation or a face-to-face interview.

The lack of human context in journalism applied to artificial intelligence can be problematic. It is important to strike a balance between using AI to improve the efficiency and accuracy of journalism, without losing sight of the importance of the human perspective in storytelling. To avoid the lack of human context, it is critical that journalists and AI developers work together. Journalists must understand how to use AI ethically and critically, while developers must consider the needs and limitations of journalism.

In this regard, it is interesting to understand the ideas of augmentation and performance, which refer to the ability of AI to increase the reporting cadence and improve the quality of reporting, rather than replacing humans with machines, and the idea of control, which is concerned with the governance and management of AI systems to ensure that they operate ethically and safely (Schmager et al., 2023).

5. Advantages and disadvantages of using artificial intelligence in journalism

After a hemerographic review of researchers and studies related to Artificial Intelligence applied to journalism, we can consider the following advantages and challenges involved in the use of such advanced tools that allow the creation of generative content.

5.1 Advantages of AI applied to journalism and media

- Efficiency in data collection and analysis: Artificial intelligence can process large amounts of information in a short time, allowing journalists to access a wide range of sources and analyse complex data more quickly and accurately.
- Personalization of content: Artificial intelligence can help journalists tailor content to individual reader preferences, improving the user experience and increasing the relevance of the information provided.
- Automation of routine tasks: Artificial intelligence can perform repetitive and monotonous tasks, such as transcribing interviews or automatically generating basic reports, freeing up time for journalists to focus on more creative and analytical activities.
- Improved fake news detection: Artificial intelligence can help identify common patterns and characteristics in fake news, making it easier to detect and prevent. This is especially important in a context where misinformation is increasingly prevalent.
- Increased interaction with users: Artificial intelligence can facilitate interaction between journalists and readers through chatbots or virtual assistants, providing quick answers to frequently asked questions or recommending relevant content based on individual interests. This encourages greater audience engagement and strengthens the relationship between media and audience.

5.2 Disadvantages and challenges of AI applied to journalism and media

- Lack of context and in-depth analysis: While artificial intelligence can collect and analyse large amounts of data, it often lacks the ability to contextualize information and

perform in-depth analysis. This can lead to a lack of perspective and full understanding of the events and issues being covered.
- Algorithmic bias: Algorithms used in artificial intelligence can be biased due to the data they have been trained on. This can result in biased or partial reporting, as algorithms may perpetuate existing stereotypes or prejudices.
- Loss of journalistic jobs: The increasing use of artificial intelligence in journalism may lead to the automation of tasks that were previously performed by human journalists. This may result in a decrease of jobs in the journalism industry, negatively affecting journalism professionals.
- Lack of ethics and responsibility: Artificial intelligence has no conscience or ability to make ethical or responsible decisions. This can lead to the dissemination of erroneous or false information without any human verification or oversight, undermining the credibility of journalism.
- Technological dependence: Relying too much on artificial intelligence can make news organizations heavily dependent on technology, making them vulnerable to technical failures or cyber-attacks. In addition, this can limit the adaptability and creativity of human journalism, as efficiency and automation are prioritized.

6. Discussion

Different methods of analysis require different resources and capabilities. It is not the same to analyse academic trends of analysis in the search for paths towards an intellectual roadmap, valid for undertaking a descriptive and exploratory type of study, as it is for field research with a wide-ranging universe based on millions of data extracted from digital storage systems. Therefore, current methodologies of analysis and research are based on exploration, democratization, and a clear distinction between the critical approach, which generates an intellectual discussion based on concepts, and the applied approach, which determines the use of AI tools in the daily life of information professionals.

As is evident, there is no one methodology that is better than another, but rather each methodology must be appropriate to the object of study and used according to the objectives and goals to be developed.

From a purely applied field of analysis in modern newsrooms and journalists' use of these technologies, AI is rapidly transforming the field of journalism in multiple aspects. Automatic news generation, fact-checking and content personalization are just a few examples of the positive impact AI can have on the industry. However, it is also crucial to address the challenges associated with implementing AI in journalism. Ongoing human oversight, ethics and transparency are critical to ensure that AI is used responsibly and does not compromise the core values of journalism.

One of the most important challenges is continuous human oversight. While AI can perform tasks such as collecting data, analysing information and writing reports, constant human oversight is essential to ensure the accuracy and fairness of algorithm-generated news. Because algorithms rely on data and predefined rules, they can be prone to error or bias.

Journalists must review and verify AI-produced content, correcting any errors or biases. Human oversight is also crucial to ensure ethics in AI-based journalism. Algorithms may have difficulty understanding the cultural, social, or political context of a news story, which can lead to the dissemination of misinformation. This challenge involves finding a balance between automation and human intervention to ensure quality, accuracy, ethics, and transparency in algorithm-generated news.

Another major challenge is the risk of compromising the core values of journalism. AI can automate many routine tasks, but it cannot completely replace the human judgement, in-depth research and critical analysis that characterize quality journalism. It is essential to maintain a balance between using AI as a support tool and preserving the essence of journalism. AI can be used to automate routine and repetitive tasks, such as data collection and analysis, allowing journalists to spend more time researching stories and producing quality journalism.

Another ethical challenge is the use of AI to generate journalistic content. Some media outlets are already using algorithms to write basic news stories, such as agency news, sports, or financial reports. While this may be efficient in terms of content production, it raises questions about authorship and ethical responsibility for machine-generated content.

Privacy is also an important issue when it comes to the use of AI in journalism. The massive collection of personal data can raise concerns about the protection of individuals' private information and its misuse. It is essential to establish clear policies on how data is collected, stored, and used in the context of AI-based journalism.

Moreover, transparency is key to addressing the ethical challenge of AI in journalism. Users need to know when they are interacting with a machine rather than a human journalist. This implies the need to clearly label AI-generated content and provide information on how algorithms are used in editorial decision-making.

7. Conclusions

The conclusions regarding the three initial objectives, after a reasoned exposition of the frame of reference, the possible methodologies of study and the applications and tools for use by the journalist in the face of the advent of artificial intelligence, can be determined in three points.

C.1 Firstly, it should be noted that current methodologies for studying artificial intelligence technology in the field of communication are diverse and are undertaken according to the perspective, typology and technologies used. For this reason, the factor understood as "technology" is becoming increasingly important in the academic world when undertaking research. This can be seen from the fact that an advanced, innovative, disruptive, and practically exponentially evolving technology such as artificial intelligence requires continuous monitoring of the discoveries, innovations and advances made.

C.2 The democratization of the use of artificial intelligence has created an audience of millions of people, which makes it more difficult to obtain a specific sample, as its segmentation is complex and requires far-reaching technical elements. Indeed, methodologies can be framed and delimited from their scientific and argumentative structure, but they must be extrapolated to novel factors that require new techniques and, above all, new resources.

C.3 In conclusion, clear and transparent policies are needed to address these challenges and ensure that AI is used responsibly in the field of journalism. While the implementation of AI in journalism offers significant benefits, it also poses challenges that need to be adequately addressed. Ongoing human oversight, ethics and transparency are critical to ensure that AI is used responsibly and does not compromise the core values of journalism. By addressing these challenges, we can maximise the benefits that AI can offer the news industry.

As we move towards an increasingly AI-driven future, it is essential that journalism professionals are prepared to adapt and take advantage of the opportunities this technology offers.

---

7. References

Bhaskar, M., y Rocca, C. (2021). La Inteligencia Artificial y las editoriales. *Trama & Texturas*, 44, 21–32. https://www.jstor.org/stable/27041960

Broussard, M., Diakopoulos, N., Guzman, A. L., Abebe, R., Dupagne, M., & Chuan, C.-H. (2019). Artificial Intelligence and Journalism. *Journalism & Mass Communi cation Quarterly*, *96*(3), 673-695. https://doi.org/10.1177/1077699019859901

Calvo Rubio, L. M. y Ufarte Ruiz, M.ª J. (2021). Inteligencia artificial y periodismo: Revisión sistemática de la producción científica en Web of Science y Scopus (2008-2019). *Communication & Society*, nº 34, 159-176. https://doi.org/10.15581/003.34.2.159-176

Canavilhas, J. (2022). Inteligencia artificial aplicada al periodismo: traducción automá tica y recomendación de contenidos en el proyecto “A European Perspective” (UER). *Revista Latina de Comunicación Social*, 80, 1-13. https://www.doi.org/10.4185/RLCS-2022-1534

De Lara, A., García-Avilés, J.-A., & Arias-Robles, F. (2022). Implantación de la Inteligencia Artificial en los medios españoles: análisis de las percepciones de los profesionales. *Textual & Visual Media*, *1*(15), 1-16. https://doi.org/10.56418/txt.15.2022.001

Editmaker. (2024). [Software]. En *Cibeles Group L.L.C* (7.0). Cibeles Group L.L.C. https://www.cibeles.net

Flores Vivar, J. M. (2019). Inteligencia artificial y periodismo: diluyendo el impacto de la desinformación y las noticias falsas a través de los bots. *Doxa Comunicación*, 29, 197-212. https://doi.org/10.31921/doxacom.n29a10

Gómez-Diago, G. (2022). Perspectivas para abordar la inteligencia artificial en la ense ñanza de periodismo. Una revisión de experiencias investigadoras y docentes. *Revista Latina de Comunicación Social*, 80, 29-46. https://www.doi.org/10.4185/RLCS-2022-1542

Haim, M., & Graefe, A. (2017). Automated News: Better than expected?. *Digital Journalism, 5*(8), 1044–1059. https://doi.org/10.1080/21670811.2017.1345643

Lopezosa, C., Codina, L., Pont-Sorribes, C., & Vállez, M. (2023). Use of generative ar tificial intelligence in the training of journalists: challenges, uses and training proposal. *Profesional De La información*, *32*(4). https://doi.org/10.3145/epi.2023.jul.08

Túñez-Lopez, M., Toural-Bran, C., & Valdiviezo-Abad, C. (2019). Automatización, bots y algoritmos en laredacción de noticias. Impacto y calidad del periodismo artificial. *Revista Latina de Comunicación Social, 74,* 1411-1433

Manfredi Sánchez, J.L., y Ufarte Ruiz, M. J. (2024). Inteligencia artificial y periodismo: una herramienta contra la desinformación. *Revista CIDOB d'Afers Internacionals, 124,* 49-72. https://www.doi.org/10.24241/rcai.2020.124.1.49

Martínez Martínez, I. J., Aguado Terrón, J. M., y Sánchez Cobarro, P.H. (2022). Smart Advertising: Innovación y disrupción tecnológica asociadas a la IA en el ecosis tema publicitario. *Revista Latina de Comunicación Social, 80,* 69-90. https://www.doi.org/10.4185/RLCS-2022-1693

Moran, R. E., & Shaikh, S. J. (2022). Robots in the News and Newsrooms: Unpacking Meta-Journalistic Discourse on the Use of Artificial Intelligence in Journalism. *Digital Journalism*, *10*(10), 1756–1774. https://doi.org/10.1080/21670811.2022.2085129

Moreno-Gil, V., Chaparro-Domínguez, M.- Ángeles, & Pérez-Pereiro, M. (2023). Fu ture journalists' fight against disinformation: analysis of university training of fers and challenges in the Spanish context. *Communication & Society*, *36*(2), 171-185. https://doi.org/10.15581/003.36.2.171-185

Murcia Verdú, F. J., Ramos Antón, R., y Calvo Rubio, L. M. (2022). Análisis compara do de la calidad de crónicas deportivas elaboradas por inteligencia artificial y pe riodistas. *Revista Latina de Comunicación Social, 80*, 91-111. https://doi.org/10.4185/RLCS-2022-1553

Ortiz, A. (2015). Enfoques y métodos de investigación en las ciencias sociales y huma nas. Ediciones de la U.

Salaverría, R. y Sádaba, C. (2023). Presentation. The neverending challenge: Exploring the renewed impact of digital technologies on journalism. *Anàlisi: Quaderns de Comunicació i Cultura, 68,* 3-6. https://doi.org/10.5565/rev/analisi.3657

Sanahuja-Sanahuja, R. y López-Rabadán, P. (2022). Ética y uso periodístico de la inteli gencia artificial. Los medios públicos y las plataformas de verificación como precursores de la rendición de cuentas en España. *Estudios sobre el Mensaje Pe riodístico*, *28*(4), 959-970. https://dx.doi.org/10.5209/esmp.82385

Sánchez-Holgado, P., Calderón, C., y Blanco-Herrero, D. (2022). Conocimiento y actitudes de la ciudadanía española sobre el Big Data y la inteligencia artificial. *Revista ICONO 14, 20*(1). https://doi.org/10.7195/ri14.v21i1.1908

Schmager, S., Pappas, I., & Vassilakopoulou, P. (2023). Defining Human-centered AI: a comprehensive review of HCAI literature, *Proceedings of the 15th Mediterranean Conference on Information Systems*, MCIS.

Suazo Galdames, I. (2023). Inteligencia artificial en investigación científica. *Informe de SciComm*, 3(1),1–3. https://doi.org/10.32457/scr.v3i1.2149

Túñez López, J. M., y Tejedor Calvo, S. (2019). Inteligencia artificial y periodismo [presentación del monográfico]. *Doxa Comunicación, 29*, 163-168. https://doi.org/10.31921/doxacom.n29a8

Ufarte Ruiz, M. J., Calvo Rubio, L. M., y Murcia Verdú, F. J. (2021). Los desafíos éti cos del periodismo en la era de la inteligencia artificial. En: *Estudios sobre el Mensaje Periodístico, 27*(2), 673-684. https://doi.org/10.5209/esmp.69708

Ufarte Ruiz, M. J., y Manfredi Sánchez, J. L. (2019). Algoritmos y bots aplicados al pe riodismo. El caso de Narrativa Inteligencia Artificial: estructura, producción y calidad informativa. *Doxa Comunicación, 29,* 213-233. https://doi.org/10.31921/doxacom.n29a11

Valdiviezo-Abad, C., y Bonini, T. (2019). Automatización inteligente en la gestión de la comunicación. *Doxa Comunicación*, *29,* 169-196. https://doi.org/10.31921/doxacom.n29a9

Funding: This study has not received funding

Conflict of interest: the authors declare that there is no conflict of interest.

English translation: provided by the authors

HOW TO CITE (APA 7ª)

Mateos Abarca, J. P., & Gamonal Arroyo, R. (2024). Research Methodologies and Uses of Artificial Intelligence Applied to Journalism. *Comunicación y Métodos - Communication & Methods, 6*(1), 90-107. https://doi.org/10.35951/v6i1.220