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An approach to the map of Artificial Intelligence research applied to Journalism in Europe (2013-2023)

Una aproximación al mapa sobre la investigación en Inteligencia Artificial aplicada al Periodismo en Europa (2013-2023)

María José Ufarte Ruiz
School of Communication University of Castilla-La Mancha. Spain.
mariajose.ufarte@uclm.es

Francisco José Murcia Verdú
School of Communication University of Castilla-La Mancha. Spain.
francisco.murcia@uclm.es

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RESUMEN

Introduction: The competitive research projects undertaken from the academy on the impact, possibilities and challenges that artificial intelligence introduces in the journalistic field is an object of study not yet projected onto a European cartography that integrates funded projects in space and time, study centers, budget and thematic lines of work. **Objectives:** This research aims to carry out a first mapping of the state of research, development and innovation in the field of artificial intelligence applied to journalism in Europe from 2013 to 2023. **Methodology:** To achieve this purpose, an exploratory methodology is used in the database of the Horizon Europe portal, in the section on grants awarded, using as key search words the different denominative labels with which the application of this technology in journalism and communication has been named. **Results:** Among the findings, the sum of more than 77,292,667.23 euros stands out among the 29

projects granted between 2013 and 2023, with a European contribution of 70,941,649.57 euros, being the United Kingdom, with seven projects, and Greece and Spain, with three projects each, the countries that lead this field of study. At the methodological level, there is a trend towards experimental work. **Conclusions:** The research projects awarded focus mainly on analyzing how to combat disinformation and designing bots and algorithms to enhance the communication of organizations. Therefore, future research is needed focused on strategies or solutions to manage the current obstacles to the use of artificial intelligence in the journalistic field, the perceptions of viewers to analyze the quality and characteristics of the content, as well as the emergence of renewed professional profiles.

Keywords: Artificial intelligence; Algorithm; Newsmaking; Journalism; Communication; Investigation project; R&D&i.

RESUMEN

Introducción: Los proyectos competitivos de investigación emprendidos desde la academia sobre el impacto, las posibilidades y los desafíos que la inteligencia artificial introduce en el ámbito periodístico es un objeto de estudio aún no proyectado sobre una cartografía europea que integre en espacio y tiempo proyectos financiados, centros de estudio, presupuesto y líneas temáticas de trabajo. **Objetivos:** Esta investigación aspira a realizar un primer mapeo sobre el estado de la investigación, el desarrollo y la innovación en el campo de la inteligencia artificial aplicada al periodismo en Europa desde 2013 a 2023. **Metodología:** Para alcanzar este propósito, se utiliza una metodología exploratoria en la base de datos del portal Horizonte Europa, en el apartado de ayudas concedidas, utilizando como palabras clave de búsqueda las diferentes etiquetas denominativas con las que ha sido nombrada la aplicación de esta tecnología en el periodismo y la comunicación. **Resultados:** Entre los hallazgos destaca la suma de más de 77.292.667,23 euros entre los 29 proyectos concedidos entre 2013 y 2023, con una aportación europea de 70.941.649,57 euros, siendo Reino Unido, con siete proyectos, y Grecia y España, con tres proyectos cada uno, los países que lideran este ámbito de estudio. En el plano metodológico, se aprecia una tendencia hacia los trabajos de tipo experimental. **Conclusiones:** Los proyectos de investigación concedidos apuestan principalmente por analizar cómo combatir la desinformación y diseñar bots y algoritmos para potenciar la comunicación de las organizaciones. Se necesitan, por tanto, investigaciones futuras centradas en las estrategias o soluciones para gestionar los obstáculos actuales del uso de la inteligencia artificial al ámbito periodístico, las percepciones de los espectadores para analizar la calidad y características de los contenidos, así como la emergencia de renovados perfiles profesionales.

Palabras clave: Inteligencia artificial; Algoritmo; Newsmaking; Periodismo; Comunicación; Proyecto de investigación; I+D+i.

1. Introduction

Artificial journalism (Túñez-López et al., 2019), robot journalism (Burrell, 2016; Kim et al., 2007; Lee and Kim, 1998; Levy, 2012; Salazar-García, 2018; Van-Dalen, 2012), algorithmic journalism (Anderson, 2013), automated journalism (Caswell and Dörr, 2018; Clerwall, 2014; Napoli, 2014), computational journalism (Coddington, 2015; Cohen et al., 2011; Gynnild, 2014; Vállez and Codina, 2018), augmented journalism (Pavlik and Bridges, 2013) and high-tech journalism (Salaverría, 2016) has become a common voice in the communicative and journalistic field. Authors such as Diakopoulos (2019), Flores-Vivar (2018), Lindén (2017), Lokot and Diakopoulos (2016), Oppenheimer (2018) and Powers (2012), among others, state that these ways of naming the profession refer to the introduction of artificial intelligence in the processes of search, production, dissemination and management of communication messages.

Artificial intelligence as a technology applied to journalism has existed since the late 1980s (Rusell and Norvig, 2003), although in recent years it has developed rapidly (Parratt-Fernández et al., 2021), arousing the curiosity of technologists and scholars (Prasad and Choudhary, 2021). Newspaper companies, for their part, have also shown interest in the application of natural language processing, and there are currently up to 103 players in the media system worldwide that integrate bots and algorithms with a variety of objectives, products and models (Tejedor-Calvo, 2023). This is a scenario that was already anticipated by Prisecaru (2016) when the

"Shows a notable increase in academic production since 2015, where exploratory and descriptive studies."

first experiences were beginning to emerge in the UK (Gani and Haddou, 2014), China (Martin, 2017), South Korea (Jung et al., 2017), France (Sánchez-Gonzales and Sánchez-González, 2017), Sweden (Stern, 2017), Germany (Horky and Pelka, 2017), Norway (Karlsen and Stavelin, 2014), Brazil (Monnerat, 2018), Finland (Melin et al., 2018) and Spain (De-Lara et al., 2022), among other countries.

In many cases, the use of these technologies has been justified because they are capable of freeing the journalist from mechanical and tedious tasks that demand many hours of work (Papadimitriou, 2016) and that machines can assume with greater efficiency (Graefe, 2016) and accuracy in a short time (Silverman, 2013; Wölker and Powell, 2018), with a corresponding increase in business profit (Mittal and Kumaraguru, 2014). The goal would be, as Pereda (2014) notes, to exempt information professionals from mechanical tasks that can be performed by a machine with minimal supervision by a human and allow them to focus on more creative aspects. However, the possibilities it offers are very different, including from pattern and trend recognition (Lemelshtrich-Latar, 2018; Steiner, 2014; Van-der-Kaa and Krahmer, 2014), to the fight against disinformation and fake news (Flew et al., 2012; Flores-Vivar, 2019) and the location profiles in social networks (Dickerson et al., 2014; Ferrara et al., 2016; Tavares and Faisal, 2013).

However, the implementation of this emerging and sophisticated tool in newsrooms (Pérez-Seijo et al., 2020) has also inaugurated different debates ranging from the quality of automated news (Sandoval-Martín et al., 2019), to deontological (Ufarte-Ruiz et al., 2021), legal (Montal and Reich, 2017; Weeks, 2014) and thoughts on the precarization of the sector (Acemoglu and Restrepo, 2019; Bostrom, 2014; Bravo-Orellana et al., 2014; Brynjolfsson and McAfee, 2014; Cerezo, 2018; Cervera, 2017; Cosoy, 2017; Matsumoto et al., 2007; Valdiviezo-Abad and Bonini, 2019) and the emergence of the first newsrooms without journalists (Ufarte-Ruiz et al., 2023).

In any case, Gutiérrez-Caneda et al. (2023) recall that among journalism experts and professionals, according to focus studies, there is a belief that this technology will play an important role in the industry, due to the fact that it reduces costs and improves the accuracy of journalistic texts (Lecompte, 2015). In addition, the content personalization discussed by Newman et al. (2019), Keeney (2015) and Slater and Rouner (2002) will help the receiver to know what is happening in their immediate environment and journalists, for their part, will be able to know in advance the news event, which will generate a close contact with the user and their greater engagement.

There is a current of opinion among communication scholars that artificial intelligence can create accessible, diverse, relevant and timely pieces of information (De-Lima-Santos and Ceron, 2022). The different perspectives that coexist point to the need for a better understanding of the consequences based on concrete experiences, with case studies that then allow for more global interpretations. In this context, the impact, possibilities and challenges that artificial intelligence introduces in the communicative field has urged scholars and different sectors of society to apply for public funding to provide a holistic view on the main findings related to this field of study. These grants are an instrument widely used by States to encourage investment in research, development and innovation by companies and public and private entities (Mote et al., 2011; Nagesh and Thomas, 2015).

2. Research objectives and questions

The main objective of this research is to elaborate a first approach to the mapping of research, development and innovation on artificial intelligence research in the communicative domain in Europe in the last ten years, which will help scholars to generate more assertive proposals for future calls for proposals. The paper seeks to answer the following research questions:

RQ1. How many R&D&I projects related to the application of artificial intelligence to journalism and communication have been awarded at the European level in the last ten years?

RQ2. Which countries are leading the research?

RQ3. What is the predominant affiliation?

RQ4. What is the budget allocation for these projects?

RQ5. What topics are most frequently researched?

RQ6. What approach is used in the research?

3. Methodology

This article aims to elaborate a first approach to a map of research on the application of artificial intelligence to journalism and communication in Europe in the last ten years. The methodological design to achieve this purpose has required a staged execution (Igartua, 2006), in which a methodological triangulation has taken place (Gaitán-Moya and Piñuel-Raigada, 1998), which according to Gómez-Diago (2010) and Soler-Pujals and Enrique-Jiménez (2012), serves to contrast information between different sources to obtain a sufficient background of the phenomena studied. The different phases are presented explicitly below so that other researchers at different times and in different circumstances can replicate this process and obtain comparable results, completing or verifying them in coherent analysis spaces (Ortega-Mohedano and Pereira-Galhardi; Igartua, 2016).

3.1. Literature review

First, a review of the reference scientific literature was carried out as part of the secondary research (Codina, 2017). For this, techniques typical of the documentary review have been applied with a compilatory and descriptive look (Bickman and Rog, 1998; Phillips and Pugh, 2008) to confront the most important contributions of state-of-the-art (Ramírez-Montoya and García-Peñalvo, 2018), to offer a contextualizing view of the subject under study, how it has evolved over time and depending on the context (Babbie, 1989; Fernández-Collado and Dankhe, 1986). This review shows a notable increase in academic production since 2015, where exploratory and descriptive studies mainly focused on analyzing the impact of bots and algorithms on the writing of journalistic texts, studying the quality of automated news and explaining the use of some programs that allow the extraction and processing of information so that journalists can discover a news event as soon as possible. Likewise, this review has noted the absence of previous work, making this research timely, not only because of its theoretical, descriptive and exploratory value, but also because it fills a gap that persists in this field of study.

3.2. Period of analysis and sample selection

This longitudinal research analyzes a 10-year time frame, ranging from January 1, 2013 to December 31, 2023. The 2013 has been chosen as the starting point because it was when the definitive takeoff of artificial intelligence in the communication sector occurred (Calvo-Rubio and Ufarte-Ruiz, 2021). With regard to the source, the European Union's Framework Program for Research and Innovation Horizon Europe (2021-2027) has been selected because it is the main European initiative for the promotion of R&D&I, from its initial phases to its development and arrival on the market. This program is conceived in terms of continuity of the Horizon 2020 Program. It complements national and regional funding and its purpose is to strengthen the EU's scientific and technological base, in addition to contributing to the achievement of the Sustainable Development Goals and boosting competitiveness and growth. It also has the largest budget to date, with the potential to generate significant economic, social and scientific benefits. The EC states that it seeks to finance world-leading science and technology, which adopt public policies and benefit the economy, the environment, science and innovation, to provide solutions to societal challenges (European Commission, 2019). In addition, it exceeds Horizon

2020 in public funding, which until now had managed to be the leading program worldwide in research and innovation, so it represents an opportunity for professionals and scholars of social communication, especially in the communication and dissemination of science (Campos et al., 2021).

This program is structured in three pillars, within which the main funding instruments are developed. The first is Excellent Science and has three objectives:

1) Supporting researchers to carry out cutting-edge, high-quality research, funded by the European Research Council (ERC).

2) Marie Skłodowska-Curie Actions (MSCA), which are research grants whose purpose is the development of the research career and the continuous training of researchers (European Commission, 2022).

3) Research Infrastructures, which finances scientific equipment, instruments and resources for the development of new infrastructures.

In the previous program, Horizon 2020 (2014-2020), this first pillar included another line aimed at financing collaborative research, with the purpose of establishing new areas of research and innovation through Future and Emerging Technologies (FET).

The second pillar is called Global Challenges and European Industrial Competitiveness, which finances projects that address societal challenges, in addition to strengthening industrial technological capabilities. This pillar is further divided into six clusters:

1) Health;

2) Culture, Creativity and Inclusive Society;

3) Civil Security for Society;

4) Digital, Industry and Space;

5) Climate, Energy and Mobility; and

6) Food, Bioeconomy, Natural Resources, Agriculture and Environment.

This second block is a reformulation of the third pillar of the Horizon 2020 program, which is called Societal Challenges and had seven main objectives:

1) To ensure health and well-being and how it affects the study of demographic change (SC1, Health, Demographic Change and Wellbeing).

2) To ensure a sufficient supply of high quality food and other bioproducts (SC2, Food security, Sustainable Agriculture, Marine and Maritime Research, and the Bio-economy).

3) To promote the transformation to a sustainable and economical energy model (SC3, Secure, Clean and Efficient Energy).

4) To achieve a green and integrated transportation (SC4, Smart, Green and Integrated Transport).

5) To achieve an efficient economy in the use of resources and raw materials in climate action (SC5, Climate Action, Resource Efficiency and Raw Materials).

6) To support social sciences and humanities for a sustainable development of social and cultural changes in European societies (SC6, Europe In A Changing World- Inclusive, Innovative And Reflective Societies).

7) To optimize the safety and security of Europe (SC7, Secure Society).

Finally, the third pillar is called "Innovative Europe" and promotes the market drive and the development of small and medium-sized enterprises through the European Innovation Council (EIC). In addition, the European Institute of Innovation and Technology (EIT) promotes the integration of research, entrepreneurship and higher education. And, ultimately, it incorporates the European Innovation Ecosystems (EIE) to enable the development of more sustainable advances. This third pillar is close to the second pillar of Horizon 2020, called Industrial Leadership, whose three main purposes were:

1) The use of technologies to boost and ensure the leadership of European industry and applied research with the Leadership in Enabling and Industrial Technologies (LEIT) program. This, in turn, has a series of sub-programs that promote research in Information and Communication Technologies (ICT); promote bridging the gap between markets and nanotechnologies, advanced materials, biotechnology, advanced processes and manufacturing; and Space, which seeks to foster more competitive companies.

2) Facilitate access to risk financing for emerging companies (Access to Risk Finance).

3) Collaborate with small and medium-sized enterprises to encourage their development and internationalization (Innovation in SMEs).

3.3. Automatic search through descriptors

Once the source has been narrowed down, a search strategy has been designed to compile the following research projects This process started with an exploratory search, in which we worked with keywords that allude to the use of artificial intelligence in journalism. The search descriptors were the different names in English that this way of writing journalistic texts has received from researchers, since this phenomenon has not yet been unanimously conceptualized in the Academy (Table 1).

Table 1. *Search terms*.

("bots" OR "artificial intelligence" OR "artificial journalism" OR "robotic journalism" OR "algorithmic journalism" OR "automated journalism" OR "computational journalism" OR "augmented journalism" OR "high-tech journalism").

Source: Elaborated by the authors.

To ensure reliability, the searches were carried out in parallel by the researchers between September 1 and October 15, 2023, after defining criteria and reviewing possible contradictions in previous meetings. The results of this search were reviewed to eliminate repetitions and filter out those projects that are not relevant to the areas of Social Sciences and Information and Communication Technologies.

3.4. Identification of the variables to be studied

A coding sheet with variables in accordance with the purposes pursued was applied to each unit of analysis. Thus, the variables to be studied include the descriptive data of the project, such as the name, the period of execution, the identifier, the total cost, the institution and the country. In addition, the subject matter and methodological approach of the project were analyzed. To ensure the reliability of the coding, the application of

the form to each project was carried out at the same time, after defining the analysis guidelines (double-check). This process avoided biases and methodological flaws to optimize the validity and consistency of the findings (Okuda-Benavides and Gómez-Restrepo, 2005).

4. Results

4.1. Funded projects

The synergies that have driven Horizon Europe and previously Horizon 2020 across science, technology, production and innovation in funded projects have motivated an increasing participation in the different calls. The high rate of journalism-related applications, which has reached 198 R&D&I projects funded from 2013 to September 2023, shows the high competitiveness presented by this European Framework Program for research teams from a large part of the world. However, after filtering and eliminating those projects that are outside the study object, the number of results is relatively low, with only 29 R&D&I projects financed in the last ten years (Table 2).

Table 2. *List of projects awarded by the European Union's Framework Program for Research and Innovation (R&I) between 2013 and 2013*.

Execution period	Title	Identifier	Framework Program	Total cost/ European Contribution	Institution / Country
2015-2021	Profiling and targeting news readers – implications for the democratic role of the digital media, user rights and public information policy	638514	ERC	1.479.515,00 € - 1.479.515,00 €	Universiteit Van Amsterdam - The Netherlands
2016-2018	Real-time Content Analysis and Processing (ReCAP) for Agile Media Production	732461	ICT	1.306.125,00 € - 990.037,50 €	NMR Consultancy Ltd - United Kingdom
2016-2019	Reverse EngiNeering of sOcial Information pRocessing	691152	Marie Curie	1.314.000,00 € - 1.273.500,00 €	Politechnika Warszawska - Poland
2016-2019	Scalable Understanding of Multilingual Media	688139	ICT	7.963.951,25 € - 6.193.361,25 €	The University of Edinburgh - United Kingdom
2016-2020	Computational Propaganda: Investigating the Impact of Algorithms and Bots on Political Discourse in Europe	648311	ERC	1.980.112,00 € - 1.980.112,00 €	The Chancellor, Masters and Scholars of the University of Oxford - United Kingdom
2017-2018	Innovative Journalism: Enhanced Creativity Tools	732278	ICT	993.270,38 € - 993.270,38 €	City University of London - United Kingdom
2017-2018	PeRsOnalized DocUmentary Creation based on Automatically Annotated Content	731893	ICT	1.496.875,00 € - 992.062,50 €	Reti Televisive Italiane SPA - Italy

2017-2019	MediaRoad – European Media Ecosystem for Innovation	761412	ICT	994.187,50 € - 994.187,50 €	EBU-UER - Belgium
2017-2019	Finding Bots, Detect Harassing Automation, and Restoring Trust in Social Media Civic Engagement	767454	ERC	149.921,00 € - 149.921,00 €	The Chancellor Masters and Scholars of the University of Cambridge - United Kingdom
2017-2020	Blockchains in the new era of participatory media experience	762091	ICT	3.283.616,08 € - 2.757.662,50 €	Wordline Iberia SA - Spain
2017-2021	Opinion Dynamics and Cultural Conflict in European Spaces	732942	FET	5.817.276,25 € - 5.817.276,25 €	Max-Planck-Gesellschaft Zur Furderung der Wissenschaften EV - Germany
2018-2019	Artificial Intelligence for a new generation of Public Relations (PR): smart digital assistant for start-ups and SMEs to maximise results of press releases within the EU-28 and beyond	836279	Innovation In SMEs	71.429,00 € - 50.000,00 €	Comunicae Seedrelease Network SL - Spain
2018-2021	Co-Creating Misinformation-Resilient Societies	770302	SC6	4.110.758,75 € - 4.110.758,75 €	Stockholms Universitet - Sweden
2018-2021	FAke News discovery and propagation from big Data ANalysis and artificial intelliGence Operations	780355	ICT	3.583.125,00 € - 2.879.250,00 €	Engineering-Ingegneria Informatica Spa - Italy
2018-2021	Open Distributed Digital Content Verification for Hyper-connected Sociality	825477	ICT	3.178.110,00 € - 2.505.027,00 €	Erevnitiko Panepistimiako Institouto Systimaton Epikoinonion Kai Ypologiston - Greece
2018-2021	Wider and enhanced verification for you	825297	ICT	2.931.000,00 € - 2.499.450,00 €	Sirma AI EAD - Bulgaria
2018-2021	Methods for Managing Audiovisual Data: Combining Automatic Efficiency with Human Accuracy	780069	ICT	3.431.593,75 € - 3.431.593,75 €	Aalto Korkeakoulusaatio SR - Finland
2018-2022	Harnessing Data and Technology for Journalism	765140	Marie Curie	3.912.451,72 € - 3.912.451,72 €	Dublin City University - Ireland

2018-2022	Providing Verification Assistance for New Content	825227	ICT	2.696.454,08 € - 2.438.810,00 €	Dublin City University - Ireland
2019-2019	Fake news recognition applying Service-based Cross-Media Analytics	854497	Innovation In SMEs	71.429,00 € - 50.000,00 €	Hensoldt Analytics GMBH - Austria
2019-2019	First real-time fact-checking tool to fight against the fake news and disinformation	855556	Innovation In SMEs	71.429,00 € - 50.000,00€	Newtral Media Audiovisual SL - Spain
2019-2022	Cross-Lingual Embeddings for Less-Represented Languages in European News Media	825153	ICT	2.998.850,00 € - 2.998.850,00 €	Institut Josef Stefan - Slovenia
2019-2022	smART socIal media eCOsytstem in a blockchaiN Federated environment	825134	ICT	4.166.877,50 € - 4.166.877,50 €	Universitaet Klagenfurt - Austria
2019-2022	Global Under-Resourced MEedia Translation	825299	ICT	2.906.098,75 € - 2.906.098,75 €	The University of Edinburgh - United Kingdom
2020-2022	Datafication, Media and Democracy: Transformation of news work in datafied society	895273	Marie Curie	214.158,72 € - 214.158,72 €	Universitet I Bergen - Norway
2020-2023	A universe of media assets and co-creation opportunities at your fingertips	957252	ICT	5.995.612,50 € - 4.932.997,50 €	Ethniko Kentro Erevnas Kai Technologikis Anaptyxis - Greece
2021-2025	Automated Verification of Textual Claims	865958	ERC	1.982.824,00 € - 1.982.824,00 €	The Chancellor Masters and Scholars of the University of Cambridge - United Kingdom
2022-2025	vera.ai: VERification Assisted by Artificial Intelligence	101070093	Digital, Industry and Space	5.691.875,00 € - 5.691.875,00 €	Ethniko Kentro Erevnas Kai Technologikis Anaptyxis - Greece
2023-2028	Modelling Text as a Living Object in Cross-Document Context	101054961	ERC	2.499.721,00 € - 2.499.721,00 €	Technische Universitat Darmstadt - Germany

Source: Portal Horizonte Europa (https://www.horizon-eu.eu/). Elaborated by the authors.

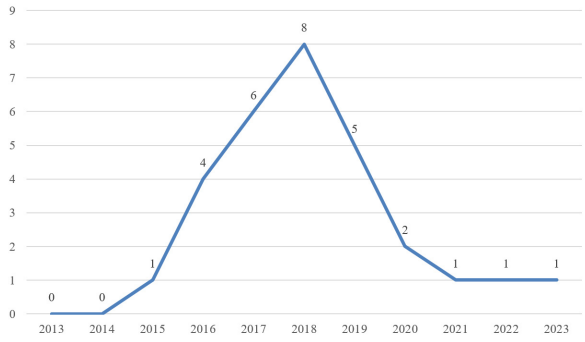
In relation to the period of execution, the awarding trend is uneven. From 2016, the figure begins to be significant, due to the fact that that same year 4 research projects are funded (13.79%) and 6 projects a year later (20.68%). But it is in 2018 when more grants are provided, accounting for up to a total of 8 projects, representing 27.58% of the total. However, from that date onwards, a downward turning point can be seen, as the figure drops in 2019 to 17.24% (N=5) and to 6.69% in 2020 (N=2). In the last three years only three projects have been awarded, one per year (Table 3).

4.2. Featured countries and universities or research centers

The researchers applying for the 29 research projects come from institutions in 15 different countries. Among all of them, the presence of centers from the United Kingdom stands out, accounting for 24.13% (N=7) of the corpus. Greece (N=3) and Spain (N=3) have the second highest number of research projects awarded in this field, with 10.34% of the total, followed by Italy (N=2), Austria (N=2), Ireland (N=2) and Germany (N=2) with 6.89% each. With only one granted project (N=1), Belgium, Finland, the Netherlands, Bulgaria, Sweden, Slovenia, Norway and Poland stand out, accounting for 3.44% of the total each (Table 4).

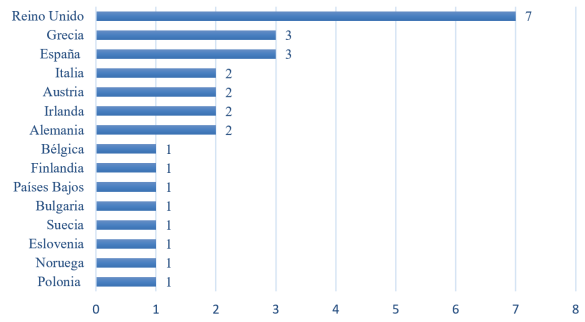
In relation to the requesting university or research center, a total of 25 different institutions have been located. The most prolific corporations, with 2 projects each, are the Ethniko Kentro Erevnas Kai Technologikis Anaptyxis (Greece), The Chancellor Masters and Scholars of the University of Cambridge (UK), The University of Edinburgh (UK) and Dublin City University (Ireland).

Figure 1: *List of granted projects per year.*



Source: Portal Horizonte Europa (https://www.horizon-eu.eu/). Elaborated by the authors.

Figure 2: *List of granted projects per country.*



Source: Portal Horizonte Europa (https://www.horizon-eu.eu/). Elaborated by the authors.

4.3. Budget

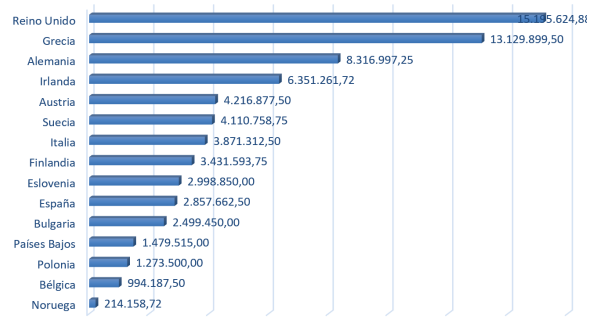
In terms of budget, granted projects in the last decade total 77,292,667.23 euros, with a European contribution of 70,891,649.57 euros, which represents 91.78% of the financing. In terms of countries, the leading universities or research centers in terms of funding are those of the United Kingdom, which account for 15,195,624.88 euros of the total, followed by those of Greece, with 13,129,899.50 euros, Germany, with 8,316,997.25 euros, and Ireland, with 6,351,261.72 euros (Table 5).

4.4. Themes and approach of the project

At the thematic level, the Horizon Europe portal database allows a first approach to the object of study, which has been complemented by a detailed analysis based on the reading of the project on the website of the Community Research and Development Information Service (CORDIS), which is the main source of the European Commission on the results of projects funded by the EU research and innovation framework programs. The results (Table 3) indicate that the most studied topic is related to the possibilities offered by

artificial intelligence, and more specifically machine learning, to combat the problem of misinformation. These proposals range from automatic text classification to feature extraction, as well as the relevant role they can play in the creation of artificial content. Secondly, there are research projects that offer intelligent tools to improve communication and management of organizations and emerging companies and SMEs, with a view to maximizing results, while thirdly, there are projects focused on analyzing the impact of artificial intelligence on journalism, taking into account the influence on news production, audiences and the profession. Other specific projects focus on analyzing the relationship between artificial intelligence and platforms, mainly social networks, studying the impact on the public sphere, democracy and political communication, as well as proposing new channels and training alternatives for researchers.

Figure 3: *Granting in euros of projects per country.*



Source: Portal Horizonte Europa (https://www.horizon-eu.eu/). Elaborated by the authors.

Table 3. *Subjects of study.*

Object of study	Projects	%
Disinformation and Verification	10	34,48%
Design of AI tools for communication and management of organizations	9	31,03%
Content production and management	6	20,69%
Platforms (social networks)	2	6,9%
Researcher training	1	3,45%
Public sphere, democracy and political communication	1	3,45%

Source: Elaborated by the authors.

At the methodological level, the research techniques used are varied, although there is a trend towards experimental work that aims to develop and design technological tools that provide added value to society and present real progress over existing knowledge. Secondly, projects with a qualitative approach stand out, focusing on the perception of professionals and experts, such as interviews, surveys and focus groups. Other methodological approaches, such as content analysis in combination with other techniques, appear with less incidence. The trend shows, therefore, that research on new topics is innovative and relies on new instruments and perspectives, which leads to innovation in methodologies or the adoption of approaches from other areas of knowledge.

5. Conclusions

This research fulfills the initially stated objective of elaborating a first approach to the mapping of research, development and innovation on artificial intelligence research in the communicative field in Europe in the last ten years. At this date, a total of 29 R&D&I projects have been awarded, an irrelevant percentage considering the total number of journalism projects awarded between 2013 and 2023 (N=198). In contrast, the major R&D&I results are located in other areas of knowledge of basic or applied science.

From the analysis of the 29 granted projects, it can be extracted that there is a terminological variety to refer to the process of elaboration and distribution of news elaborated and published from procedures executed

by machines in which journalists do not intervene to write or voice the text. The first research projects were granted in 2015, but it is in 2018 when the largest number of researches are funded. The first question raised in this research is therefore answered.

"There are competitive research projects that are committed to designing bots and algorithms to enhance communication in organizations."

Similarly, the results allow answering the second and third research questions by indicating that the United Kingdom, Greece, Spain, Germany, Italy, Austria and Ireland are the leading countries in terms of the number of grants. In terms of universities or research centers, the Ethniko Kentro Erevnas Kai Technologikis Anaptyxis, The Chancellor Masters and Scholars of the University of Cambridge, The University of Edinburgh and Dublin City University stand out.

As per budget, the granted projects between 2013 and 2023 total an amount of €77,292,667.23, with a European contribution of €70,941,649.57, which represents 91.78% of the funding. Specifically, Ethniko Kentro Erevnas Kai Technologikis Anaptyxis leads the budget, with a total of 10,624,872.50 euros in two different projects. In second place is The University of Edinburgh, with 9,099,460 euros worth of European funding, also belonging to two different projects, while Dublin City University is in third place with 6,351,261.72 euros of funding.

At the thematic level, the greatest weight of the research focuses on analyzing artificial intelligence as a suitable tool to detect and combat disinformation and fake news effectively, evaluating the features that can be used for their automatic identification to contribute to a better-informed society. Secondly, there are competitive research projects that are committed to designing bots and algorithms to enhance communication in organizations. In short, these are research projects that are committed to technological development and provide added value to society by presenting a real advance on existing knowledge at the European level. At the methodological level, there is a trend towards experimental work, prototyping and demonstrating ideas to stimulate creativity and innovation in the European environment.

The R&D&I projects funded between 2013 and 2013 offer precise and relevant proposals, but research on possible solutions and strategies to adequately manage the ethical, labor and social challenges presented by high technologies in the journalistic field is still needed. There are also no proposals focused on the quality of artificial journalism, despite previous research showing that the narrative structure of texts generated by algorithms is reiterative, since it is possible to identify a constant pattern in the sequential arrangement of data (Murcia et al., 2022; Túñez and Toural, 2018).

In this regard, research on the impact, possibilities and challenges that artificial intelligence introduces in the journalistic field during the last decade shows a lack of strategies or solutions to face the current challenges faced by this way of doing journalism, so future R&D&I projects should emphasize possible solutions and strategies to manage the current obstacles of the use of artificial intelligence, as it is essential to ensure a well-informed citizenry. Similarly, future applications could also include real reviews and perceptions of viewers to rigorously analyze the quality and characteristics of the content created by this technology. Finally, the line of research should consider including other elements such as the emergence of renewed professional profiles. There are, therefore, many challenges in the coming years in a still uncertain scenario.

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AUTHORS' CONTRIBUTIONS

Authors' contributions:

Conceptualization: Ufarte Ruiz, María José. **Software:** Murcia Verdú, Francisco José. **Validation:** Ufarte Ruiz, María José y Murcia Verdú, Francisco José. **Formal analysis:** Ufarte Ruiz, María José y Murcia Verdú, Francisco José. **Data curation:** Murcia Verdú, Francisco José. **Drafting-Preparation of the original draft:** Ufarte Ruiz, María José. **Drafting-Revision and Editing:** Murcia Verdú, Francisco José. **Visualization:** Murcia Verdú, Francisco José. **Supervision:** Ufarte Ruiz, María José. **Project management:** Ufarte Ruiz, María José. **All authors have read and accepted the published version of the manuscript:** Ufarte Ruiz, María José y Murcia Verdú, Francisco José.

AUTHORS:

María José Ufarte Ruiz
University of Castilla-La Mancha. Spain.

María José Ufarte Ruiz has a degree in Journalism (2005) and a PhD in Journalism (2011) from the University of Seville. She is currently a full professor in the School of Communication at the University of Castilla-La Mancha. She is the main researcher of the research group Journalism: Narratives and Technologies and has been a visiting researcher at the University of La Frontera (Chile) and the University of La Sapienza (Rome). In addition, she has participated in various national and international R&D&I projects and has several academic research and teaching internships in prestigious centers. Her research interests include the evolution of journalistic genres, new narratives and emerging technologies.
mariajose.ufarte@uclm.es

H-index: 16
Orcid ID: https://orcid.org/0000-0002-7713-8003
Scopus ID: https://www.scopus.com/authid/detail.uri?authorId=56023260800
Google Scholar: https://scholar.google.es/citations?hl=es&user=n4yhLI8AAAAJ
ResearchGate: https://www.researchgate.net/profile/Maria-Jose-Ufarte-Ruiz
Academia.edu: https://independent.academia.edu/MariaJos%C3%A9Ufarte

Francisco José Murcia Verdú
University of Castilla-La Mancha. Spain.

He holds a PhD and a graduate degree in Journalism from the University of the Basque Country and is an assistant professor at the School of Communications of the UCLM, where he teaches in the Newsroom area. He holds a Master's Degree in Innovation in Journalism from the University Miguel Hernández. He has made national and international internships in centers of recognized prestige and he is the author of scientific articles published in journals of impact. He is member of the Research Group Journalism: Narratives and Technologies (NARRATEC). He researches on the influence of technologies on journalistic genres, the relationship between journalism and literature and the situation of journalistic disinformation and fact-checking. Professionally, he has worked as an editor in print and online media for more than fourteen years.
francisco.murcia@uclm.es

H-index: 8
Orcid ID: https://orcid.org/0000-0001-6020-1689
Scopus ID: https://www.scopus.com/authid/detail.uri?authorId=57203480899
Google Scholar: https://scholar.google.es/citations?user=Prv_l28AAAAJ&hl=es&oi=ao
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