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AI Implementation Strategies in the Spanish Press Media: Organizational Dynamics, Application Flows, Uses and Future Trends

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This research analyses the artificial intelligence application strategies adopted by the Spanish press media at the height of the generative AI boom, extending previous studies on integrating AI technology into journalistic routines. We studied the dynamics of implementation of AI solutions in the main newspapers in Spain, determining the departments or professionals involved, the current uses, and how AI affects their organization chart and professional profiles, as well as providing insights into the future trends of this technology in the sector. For this purpose, a qualitative methodology was employed, based on interviews with a purposive sample of executives from the 10 newspapers with the largest circulation in Spain: El País, La Vanguardia, Marca, La Voz de Galicia, As, ABC, El Mundo, El Correo, El Diario Vasco *and* Mundo Deportivo. *The results reveal that AI is conceived in the Spanish press media as an assistant aimed at optimizing all kinds of mechanical processes and existing products, not at amplifying coverage or generating final pieces that reduce the standard of quality essential to their subscription model. Groups such as Prisa, Vocento or Unidad Editorial centralize their AI strategy, while Grupo Godó delegates this management to its headers. These newspapers consider that AI will boost the renewal of job profiles in their structures, despite the fact that they do not currently have strictly specialized professionals.*

Keywords: *journalism, automation, artificial intelligence, ChatGPT, news.*

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THE IMPACT OF AI ON JOURNALISM

AI in journalism began by addressing basic automation tasks, later evolving into sophisticated applications capable of reporting and data analysis. This progression reflects broader technology trends, where advances in AI have progressively enhanced its applicability in other fields, including communication. The development of AI technologies from simple data sorting algorithms to advanced natural language generation tools illustrates a significant shift in the capabilities and potential of AI in news generation (Gondwe, 2023).

As Charlie Beckett, professor at the London School of Economics (LSE), and director of the Journalism AI Project, points out, newsrooms around the world are looking to incorporate AI into their workflows, aspiring to capitalize on AI's potential to increase productivity and impact, especially in times of declining funding and revenue streams for news (Euronews, 2023). In this context, the Reuters Institute for the Study of Journalism highlights 2023 as a watershed year for AI in journalism, underlining its growing relevance in the sector (Reuters Institute, 2023).

In particular, generative AI tools such as ChatGPT and Midjourney have become increasingly relevant in news production contexts, offering opportunities for greater production efficiency and the creation of new types of semi-automated content. Some internationally recognized media, such as The Guardian in the UK, has declared its intention to use generative AI to improve the quality of journalistic work, for example, by helping journalists interrogate (through *prompts*) large data sets and create ideas for new marketing campaigns (Euronews, 2023).

However, the speed with which these technological developments emerge complicates the confrontation and reflection of the ethical implications linked to them (González Arencibia and Martínez Cardero, 2020). In the case of AI, the advance of prototypes progresses faster than the capacity of institutions or organizations to offer legal and deontological responses (Pedrero-Esteban and Pérez-Escoda, 2021), which highlights the need to assume the ethical implications of the new digital media context in which algorithms learn from human routines for the purpose of personalizing the content offered.

These algorithmic recommendation engines decipher each individual's preferences based on browsing time and their digital trail, recognizing their tastes and selectively filtering consumption proposals (Lee, 2018), which positively assists in situations of infodemia, a concept popularized by the WHO (2020) during the Covid-19 pandemic and defined as an overabundance of information on a topic, either "rigorous and truthful or false and confusing that makes it difficult for people to find trusted sources".

In the field of news and media, there has always been a constant concern about the potential reduction of diversity that algorithmic recommender systems could cause (Napoli, 2011). This debate has evolved towards the notion of "filter bubbles" (Pariser, 2011), which are generated from collaborative filtering that tends to leave out specific content of interest in favour of that which is more popular (Bozdag and Hoven, 2015). However, recent research has revealed that

algorithms have the ability to provide diversity on par with human editors (Möller *et al*., 2018), and suggests that the uncertainty around filter bubbles may have been exaggerated (Zuiderveen-Borgesius *et al*., 2016).

In modern journalism, AI is increasingly being incorporated to improve the efficiency, accuracy and depth of reporting. Today, media outlets around the world are integrating AI into all phases of newsmaking, from routine information production to complex investigative journalism. The areas where AI is most popular so far are in automating news generation, analysing large data sets to uncover trends and stories, and even in improving audience engagement through personalized content (Diakopoulos, 2019).

The AI application that has most permeated socially and has generated the most controversy is the one focused on content production. This generative AI is based on neural networks that are trained through machine learning processes, including deep learning (Campesato, 2020). Its use has implications in different spheres such as labour, economics or education, which has led to the emergence of initiatives that promote ethical and responsible use, such as the OdiseIA observatory, Google's AI for Social Good program, or the OpenAI project (Franganillo, 2023).

Journalism or automated content entails ethical, legal and social risks and challenges (Davenport and Mittal, 2022) related to veracity, authorship, transparency, accountability or influence on public opinion, from which derives a complex panorama with multiple possibilities, but also with obstacles or threats that need to be monitored (Franganillo, 2023). For this reason, technological developers must ensure the transparency and accountability of their proposals, for which the European Parliament has laid the foundations of the Artificial Intelligence Act to regulate the use of the data that feed generative models and to protect the privacy of citizens against possible infringements of rights or malicious uses (Ayuso and Pascual, 2023).

Since the irruption of generative artificial intelligence in society, led by the universal and massive access to open solutions such as ChatGPT or Google Bard, no research prior to this study has been identified that analyses the strategies of the Spanish press media with respect to AI, so this paper collects the results of the initial studies by Hansen *et al*. (2017) and Gutiérrez-Caneda *et al*. (2023) on the use of AI in newsrooms, of Bullard (2023) on the impact of AI in journalism, including chatbots and image generators, and of Gilbert (2021) that highlights the role of AI in improving the news experience. It also updates the study of the impact of AI in journalism already addressed, among others, by Túñez-López *et al*. (2021) on AI in journalistic enterprises; Ufarte-Ruíz *et al*. (2023), on synthetic media; Toural-Bran and Vizoso (2022), on automated journalistic training; Santos (2023), on misinformation; and Hireche *et al*. (2023), on robo-reporters.

This paper provides a current vision and a future projection on the application of AI in journalistic companies, taking as an object of study the newspapers that OJD (Spanish Office of Justification of Diffusion) identifies with the largest circulation. For this purpose, it examines the organizational dynamics, the application implementation flows followed, the impact on professional profiles, the current uses and the forecasts of future trends in the incorporation of AI.

Generative AI Concepts and Models

If we talk about generative artificial intelligence in journalism or information production, we must mention the model that has popularized Generative Pretrained Transformer (GPT) technologies, specifically ChatGPT. In June 2023, ChatGPT, based on GPT-3, had more than 100 million users and 1.6 billion monthly visits, data that speak of the popularization of this technology, among whose possibilities it has appeared as a new way of production for some journalistic media, and are the origin of discussions on intellectual property or the ethics of generative AI, among others. The high capacity of this tool to handle a wide range of *queries* and its reasoning and text generation abilities reflect its versatility, and it is understood that it can be especially useful in journalism to generate news and diverse content, as other scholars such as Wang *et al*. (2023) have already begun to explore.

Authors such as Gondwe (2023), who have addressed the conceptualization and application of Generative AI in journalism, propose to divide this technology into several key areas:

- Computer Vision (CV): Allows computers to extract meaningful information from digital images, with applications such as facial recognition and image interpretation used in journalism.
- Speech recognition: Focuses on converting human speech into text data, often used in applications that follow voice commands or respond to spoken questions.
- Natural Language Processing (NLP): Computational processing of human language allows computers to manipulate text and spoken words in a manner similar to humans. PLN is used to understand and respond to text or speech data, extract meaning from sentences, and generate readable text.

At the same time, the author concludes that, for the time being, generative AI is applied in journalism in two main ways:

- Content generation: AI algorithms are used to automatically create news articles, reports, summaries and other journalistic content. This allows AI systems to generate coherent and contextually relevant text, mimicking human-like writing styles.
- Data analysis and insights: Artificial intelligence algorithms are used to analyse large data sets, identify patterns and draw meaningful conclusions for journalistic purposes. This includes automated data processing, visualization and interpretation.

Despite these efforts to generate definitions of the technology, more longitudinal studies are still needed to fully describe the status of generative AI in the media as a whole, with the understanding that the adoption of AI in journalism varies internationally, and is influenced by factors such as technological capabilities, media policies and cultural contexts. Countries that have been adopting AI in

journalism have done so at different rates and to different degrees, reflecting the diversity of technological advances and media landscapes, but also making it clear that for the moment it is a tool that requires high media literacy, and therefore also has significant barriers to its use (Gilbert, 2021).

In Spain, in recent years there has been a growing openness to the use of AI in the press media, especially in the collection and distribution of information. However, there is still some reluctance regarding its application in content production, mainly due to disbelief and lack of knowledge about the automated options offered by artificial intelligence (Fieiras *et al*., 2022a; Sánchez-García *et al*., 2023).

The potential of AI in news verification is relevant, but represents a complex challenge due to the structural nature of fake news (Fieiras *et al*., 2022b). Current research is in early stages in order to identify biases in news through AI (Rodrigo-Ginés *et al*., 2023). Thus, the relationship between AI and content verification in journalism is moving towards the resolution of ethical issues related to transparency and data protection of users (Santos, 2023).

It has been shown that as AI advances, the possibilities of deception also increase, since the development of sophisticated systems that generate artificial content with a high degree of verisimilitude can confuse society if an appropriate code of conduct is not established. This is why it is essential to raise public awareness about the ethical and responsible use of this technology, because although generative AI can increase productivity, it can also cause conflicts in terms of democracy, employment, economics or culture (Franganillo, 2023).

Although AI is rapidly reaching all audiences through accessibility to the tools, as long as there is no generalized training and understanding of how these systems work, it will not be possible to speak of real democratization. Although it is irrefutable that artificial intelligence is democratizing in certain aspects, it is also necessary to recognize that there are private interests that restrict or condition this process (Franganillo, 2023).

In the particular field of public media, the implementation of technology, and particularly AI, must be aligned with the public values that define its nature, prioritizing ethical aspects over market demands and priorities (Sørensen *et al*., 2021). Therefore, there is questioning whether the use of artificial intelligences and algorithms, which entail digital personalization, could harm the universality and privacy of users (Bulck and Moe, 2018).

The incorporation of AI in public service media allows forms of differentiation with respect to those of commercial media, through the incipient development of public service algorithms that avoid the formation of bubble filters and echo chambers, while protecting user data (Fieiras *et al*., 2023), which invites reflection on whether the operational line followed by private proposals overly infringes on the privacy of audiences and limits access to plural, universal and diverse content.

OBJECTIVES

The aim of this research is to know the strategic position of the 10 printed newspapers with the largest daily circulation in Spain with respect to artificial

intelligence and to identify the current organizational and production dynamics, the flows of implementation of automated tools, the departments and professionals involved, the current uses and their impact on the current and demanded professional profiles, as well as the trends that are expected for the immediate future in order to anticipate the evolution of the integration of AI in journalistic routines. To this end, they set as objectives:

- To know the point of implementation of AI in the reference press media in Spain, its interest in this technology and its strategic approach.
- Identify which departments are in charge of AI in the press media and the internal implementation flows that follow.
- To specify the impact of AI integration on professional routines and profiles.
- To determine the AI solutions applied by the press media in the newsmaking, content verification and recommendation phases, and the expected future trends.

METHODOLOGY

This research is exploratory, descriptive and, therefore, hypothesis-blind. We chose to use qualitative methods, and resorted to in-depth personal interviews with a semi-structured questionnaire, conducted as a Delphi and in two rounds, to professionals with management positions and strategic vision of the 10 newspapers with the largest circulation in Spain.

A purposive sample is used based on data from the Association of News Media (AMI), with data from the September 2023 report, provided by the companies themselves, prepared by KPMG and collated by OJD. Print media are chosen instead of digital native newspapers with a single web edition in order to work with corporations with more longitudinal trajectories whose workers, routines and structures have progressively experienced the digitizing process of change from a traditional model to the current one.

The sample includes *El País*, *La Vanguardia*, *Marca*, *La Voz de Galicia*, *As*, *ABC*, *El Mundo*, *El Correo*, *El Diario Vasco* and *Mundo Deportivo*, whose aggregate relative weight of daily circulation (average daily circulation plus individual subscriptions) represents 57.24% of the total market (374,353 units out of 653,954), which makes it possible to make the convenience sample representative, since it also includes titles belonging to the five most important newspaper publishing groups in Spain: Grupo Prisa, Grupo Godó, Unidad Editorial, Corporación Voz de Galicia and Vocento.

Table 1. List of the 10 print newspapers with the highest daily circulation in Spain

Outlet	Daily average copy sales per issue + individual subscriptions (September 2023)	Relative weight daily diffusion
El País	52.923	8,09%
La Vanguardia	49.213	7,53%
Marca	44.294	6,77%
La Voz de Galicia	38.292	5,86%
As	37.293	5,70%
ABC	35.768	5,47%
El Mundo	33.633	5,14%
El Correo	33.137	5,07%
El Diario Vasco	29.236	4,47%
Mundo Deportivo	20.564	3,14%
Total	374.353	57,24%
Aggregation of copies per day	653.954	100%

Source: Own elaboration based on September 2023 AMI data.

Table 2. Purposive convenience sample

Abbreviation	Name	Corporation	Cargo	Publishing group
(MP/EP)	Mari Luz Peinado	*El País*	Digital Strategy Director	Prisa Group
(JA/V)	Joel Albarrán	*La Vanguardia*	Deputy Director	Godó Group
(EC/Marca)	Emilio Contreras	*Marca*	Deputy Director and Head of Digital	Editorial Unit
(XV/LV)	Xosé Luis Vilela	*La Voz de Galicia*	Director	Voz de Galicia Corporation
(TC/As)	Tomás de Cos Relaño	*As*	Deputy Director	Prisa Group
(CC/ABC)	Carlos Caneiro	*ABC*	Deputy Director	Vocento
(VC/EM)	Vicente Ruiz	*El Mundo*	Deputy Director	Editorial Unit
(AA/EC)	Aitor Alonso	*El Correo*	Director of Digital Strategy, New Narratives and Publishing Marketing	Vocento
(EU/DV)	Eli Ugalde	*El Diario Vasco*	Marketing Director	Vocento
(CD/MD)	Carlos Duart	*Mundo Deportivo*	Product Manager	Godó Group

Source: Own elaboration.

The research is developed through interviews with senior management professionals from the 10 media in the sample (Table 2) via video call by Microsoft Teams, Skype or Google Meet between October 2 and November 20, 2023, with an average duration of 40 minutes. The questionnaire includes specific content depending on the corporation interviewed, the central blocks being the strategic approaches to AI, the implementation flows of this technology, the organizational dynamics adopted around AI, the perceptions of workers with respect to it, current uses and applications, and forecasts of progress and impact.

The methodological triangulation is achieved by complementing the in-depth interviews with a bibliographic sweep of the scientific literature on AI in the media or technological innovation and the analysis of the main contents of these media and the operation of their platforms to detect possible uses of automated techniques in their proposals.

RESULTS

Strategic Position of the Spanish Press Media with Respect to Artificial Intelligence

The main print newspapers in Spain are in an initial phase of interpreting value and seeking the usefulness of artificial intelligence, with simple approaches to the automation of daily tasks. Except in specific cases, the use of generative AI is rejected for the moment. The common declared intention is to take advantage of the possibilities of AI with caution to optimize their core products or services and thus achieve qualitative differentiation, but not to use it to generate an amplification of coverage that, they believe, would end up with an endless race between media that would alter the essence of their subscription model based on the differentiation of authored content.

These newspapers pay special attention to the regulation of technology and artificial ethics, being one of the concerns most frequently mentioned by their executives. The forecast is that AI will be incorporated for the automation of routine tasks in which there is no real journalistic contribution, for which it is proposed as an assistant that cuts execution times of simple tasks, not as an aggressive agent that motivates the reduction of human capital. AI is conceived by newspapers as an opportunity to vindicate the importance of journalism and information professionals, who in their opinion should always supervise the activity of algorithms, without giving them autonomy or responsibility.

In the vision of the reference press media, there is agreement that human value, narrative quality, contrast and credibility will be the distinctive features of their brands. They identify as the main limitation of generative AI the production of flat pieces without differential contribution, offering an amplification of coverage that currently does not interest most of these newspapers.

On the organizational side, it is common for the different editorial groups to establish a joint line of action for the different titles, analysing the technology market through their transversal technology, strategy or product departments.

Subsequently, the ideas or tools identified as relevant are proposed to these same sections within the media and it is the latter who analyse their real interest before landing them in the appropriate newsrooms or departments.

Based on the analysis of the strategic lines of application of AI in these headers, and the specific uses they make of it (detailed in section 4.4 of this project), this research proposes a four-level scale of implementation of this technology, reflecting the point of development in which each corporation is: the lowest point, or 'null' status, represents those media that have not yet introduced any AI tool in their routines and show no interest in the concept; the 'initiation' point refers to those media with timid approaches to this technology, but without a firm strategy; the 'intermediate' status includes those headers with more sophisticated uses or with longer trajectories of implementation; while the 'advanced' level would reflect those media with a strong proposal or transversal AI strategy and with a variety of tools that permeate all phases of newsmaking, circumstances that have not yet manifested themselves in the 10 titles studied, with most of them at the initiation level, with the exception of *El País*, *Mundo Deportivo* and *ABC*, with a longer trajectory in the integration of AI in their routines or with more advanced application proposals.

Table 3 below presents the levels of the proposed implementation scale, while Table 4 specifies the strategic position of each medium with respect to the IA.

Table 3. Proposed IA implementation scale

AI implementation level	Description
Null	No AI tools or applications
	No clear interest in the concept
Initiatory	First approaches to AI tools for solving simple tasks
	Lack of AI implementation strategy
Intermediate	AI prototypes and tools with longer implementation track record or more sophisticated developments.
	Possibility of creating or publishing generative AI content and outlining strategic plans
Advanced	Strong cross-cutting AI proposal
	AI tools implemented in all phases of news creation and task solving

Source: Own elaboration.

Table 4. Strategic position of Spain's main print newspapers in relation to AI

Outlet	Implementation point	Strategic position in relation to AI
El País	Intermediate	They have been using algorithms and introducing automated tools to transform and optimize processes for years.
		They closely follow the progress of AI through a specialized work team, analysing how to integrate it into new tasks.
		They do not employ generative AI and do not plan to do so, even for the most basic products, as they believe it would alter the essence of their subscription model.
		They claim that they constantly receive offers for AI products and services.
La Vanguardia	Initiatory	In the AI interpretation phase. Very attentive, but cautious. They do not want to be on the sidelines, but neither do they want to delegate responsibilities to the AI.
		The human factor, credibility and contrast will be the hallmarks of the brand. AI, always with supervision.
		The main limitation they detect is that it does not provide a differential value, but rather an amplification of coverage that currently does not interest them. When they identify how it can help them, they will incorporate it into their systems.
Marca	Initiatory	In the initial implementation phase, caution. They received offers from tools producing more than 8,000 single parts per day, which they rejected.
		Intention to use AI to optimize core products and add value, not to amplify coverage.
		They have an AI Transversal Commission in Unidad Editorial with weekly meetings to update and search for tools.
La Voz de Galicia	Initiatory	Prediction that AI will totally transform journalistic routines. Fundamental to artificial ethics and human control over technology.
		They develop prototypes and ideas in their lab, but without publishing anything for the moment.
		Foreseeing new uses of structured data and documentary information to optimize process efficiency.
		They conceive of AI as assisting essential human labor, not as cost savings.

Outlet	Implementation point	Strategic position in relation to AI
As	Initiatory	Operational strategy 100% focused on the digital version.
		Predictive analytics use in predictive analysis of results or other parameters that nurture the parts, they do not value the use of AI to generate final products.
		While waiting to study the real benefit of implementing AI to amplify the current coverage, and always with human supervision.
ABC	Intermediate	Growing interest on the part of management and journalists in learning how to use AI to optimize and simplify processes.
		Transversal testing of Grupo Vocento to create useful content with AI to assist journalists, not to create final products.
		Intention to implement training on specific AI tools.
El Mundo	Initiatory	They see AI as an opportunity to improve product and profitability.
		They have an AI Transversal Commission in Unidad Editorial with weekly meetings to update and search for tools.
		They have provided ChatGPT training to their editors, plan to use generative AI to amplify coverage and improve their current offering.
El Correo	Initiatory	Caution and expectation. Occasional uses for experimentation and basic professional application.
		They don't think of AI to generate more content, but to improve and streamline processes.
		They believe that the media will be dedicated to creating unique, quality, exclusive content focused on their sphere of influence.
El Diario Vasco	Initiatory	The first tests were carried out in the marketing and promotion department, with no experience in copywriting at the moment.
		Watch out for new developments and possible applications for the automation of simple tasks.
		Forecast of use in the management and automated handling of social networks and digital platforms.

Outlet	Implementation point	Strategic position in relation to AI
Mundo Deportivo	Intermediate	Early 2023 focused on solution tracking and testing in AI prototypes. High interest in generative AI.
		Use of generative AI to create content that was not previously covered with the intention of generating engagement and capturing users.
		They envisage a progressive introduction of simple solutions that optimize specific routine processes.
		The sector is expected to move towards personalization.

Source: Own elaboration.

Organizational Dynamics for Managing AI Applications and Resources

The implementation flows of artificial intelligence applications and organizational dynamics vary according to each media and editorial group, without identifying for the moment any department specialized in AI in the newspapers studied. Only Unidad Editorial has a committee dedicated exclusively to AI. It was recently created and is made up of its technology team, an editor from each newspaper and the digital director (CDO) of each of its media, who hold weekly meetings to review new tools and automation possibilities.

The Prisa and Vocento groups also articulate joint transversal strategies for all their newspapers, which then decide, through their internal teams, which applications to integrate in their respective newsrooms. The newspapers belonging to Grupo Godó manage their lines of action independently, although they sometimes propose joint initiatives from time to time. *La Voz de Galicia* and *El País* are the only media that would consider the creation of a specific internal department for AI innovation in case this technology reaches a significant relative weight, while the rest of the newspapers think of keeping the teams or commissions currently responsible for it in charge. Table 5 shows the dynamics of AI resource management and the departments related to its implementation in each newspaper.

Table 5. Organization of AI resources in Spain's main print newspapers

Outlet	Organization of artificial intelligence resources
El País	Management is part of the Prisa Group's transversal strategy.
	They created a specific task force to track and analyse the progress of AI in the sector and new related tools.
	The product department would then move the tools to the newsroom together with this AI team.
La Vanguardia	IA managed by the New Projects department, in charge of innovation-related matters.

Outlet	Organization of artificial intelligence resources
Marca	Unidad Editorial has a recently created AI Transversal Commission to provide solutions to all its titles.
	At *Marca*, AI would be managed by the technology team together with the product team, which is the link between technology and the newsroom.
	In the case of incorporating new solutions, they would opt for outsourcing rather than creating a specialized in-house department.
La Voz de Galicia	The New Audiences department would manage the tools. Once analysed, it would test and implement them in the newsroom.
	Should AI become more important, the creation of an innovation and development department would be possible.
As	Management is part of the Prisa Group's transversal strategy.
	The *AS* product team would land the initiative at the head end together with the department involved in the initiative.
	They do not foresee the creation of a new IA department; the product team would continue to be the intermediary between Grupo Prisa and the newsroom.
ABC	Centralized management in Vocento's Strategy and Analytics Department in Madrid, in combination with the Group's technology team.
	At *ABC*, it is the technology and product teams that land the concepts in a small editorial team that also participates.
El Mundo	Unidad Editorial has a recently created AI Transversal Commission to provide solutions to all its titles.
	At *El Mundo* it would be the digital and technology managers who would transfer the tools to the newsroom .
El Correo	Centralized management by Vocento, which acquires the licenses on a group basis and sets up the systems.
	At *El Correo*, the digital strategy team would land the concepts in the corresponding department.
El Diario Vasco	Centralized management at Vocento.
	When a prototype is implemented, a specific internal work team would be created at the head office with professionals linked to the tool to land the concept in the corporation.
Mundo Deportivo	The head-end product team manages AI solutions.
	Joint cross-cutting solutions for the entire Godó Group are also being assessed.

Source: Own elaboration.

Impact of AI Integration on Newspaper Workforces and Recruitment Supply

The Spanish press media still does not identify professionals strictly specialized in artificial intelligence, nor does it include training as a requirement of interest in its hiring offer. In all these newspapers they have professionals on staff who are in a position to understand and keep track of the AI prototypes that are trending and beginning to settle in the sector, despite their self-taught training derived from other technological needs such as data analytics or code engineering.

All agree that as AI is progressively introduced into their structures, they will need specialized personnel to optimize solutions and extract maximum performance, which is not decisive in the current context where they value more the profile of a multitasking communicator who is capable of producing content in different formats. These newspapers advocate the gradual training of their own employees rather than drastically renewing their workforces with specialized professionals, and believe that AI will stimulate an important reconversion of profiles as happened with the digitizing process that their business models underwent.

Table 6. Professional profiles and AI-related hiring in Spain's leading print newspapers

Outlet	Professional profiles and AI-related recruitment
El País	Its technology journalists have an in-depth knowledge of AI although they are not solely specialized in it.
	They have offered small joint trainings to their employees on current trends and possible uses.
	Through their AI team, they analyse what training may be necessary for their journalists, graphic designers, photographers and other newspaper professionals.
	They believe that they will take AI training into account in the future as SEO or RRSS skills were once incorporated.
La Vanguardia	No specialized profiles or demanded so far.
	In the New Projects team, the professionals are able to understand and assimilate these automated prototypes.
	Data and code analyst profiles, hired 7/8 years ago, are the professionals who can understand them today.
Marca	They have a journalist in the process of specialization following the current events and useful tools available.
	As AI becomes more established in your newsroom, specialized profiles will be in demand in parallel.
La Voz de Galicia	No strictly specialized profiles or recruitment claims. They are trying to progressively train their team of new audiences.

Outlet	Professional profiles and AI-related recruitment
AS	Without specialized professionals.
	The product team members are the most knowledgeable about the different technologies.
ABC	No specialized professionals, and no intention of including the AI profile in its recruitment offer until this technology becomes more pervasive in its structure.
	Intention to train on specific tools to optimize their use and exploitation.
El Mundo	They have provided specific training in ChatGPT to extract the full potential of this tool, which they integrate in many of their daily tasks.
	They plan to provide AI refresher training every 2/3 months to optimize the tools they already use and discover new ones.
El Correo	Expectant and with superficial self-taught training in the case of some workers to get to know the tools, try them out and see the possibilities.
	No specialists and no current intention to hire.
El Diario Vasco	No specialized professionals.
	They are looking for multitasking journalists rather than AI specialists.
Mundo Deportivo	They do not have specialized professionals nor are they demanding it in the hiring process. They foresee that they will incorporate it as they have more AI features and need to optimize their operation.
	They advocate training their own workers rather than hiring specialists.

Source: Own elaboration.

Specific Uses of Artificial Intelligence in Newsrooms

The current uses of AI and the foreseen incorporation of automated solutions in the Spanish press media are aimed at optimizing the existing offer created by its journalists and cutting the time spent on routine tasks in order to reserve those efforts for more specialized or creative work. Although most newspapers have already carried out internal tests for the production of texts with AI, only *Mundo Deportivo* has managed to publish artificial news pieces supervised by its editors and on simple topics that they did not cover before, such as lottery results, weather forecasts or chronicles of non-professional categories.

The rest of the newspapers consider that, for the moment, they are not interested in expanding their coverage with simple pieces that deviate from their quality standards, and value their future incorporation only to capture specific niches of users so that they are redirected to their core content, as *Mundo Deportivo* does at present. The exception is *El Mundo*, which values the use of generative AI to generate simple texts on specific topics such as election results in small cities.

At Unidad Editorial they work with generative AI in an application that they have integrated into their CMS, aimed at creating promotional texts in news format about different Amazon products that they recommend from their headers. This is not related to news production, but is a tool linked to the business line through which they generate pieces that are subsequently supervised by their editors and published in their 'Bazaar' section. Likewise, in the specific case of *El Mundo*, they use ChatGPT on a daily basis for different functions such as translating information, adjusting the length of the pieces they transfer from the online version to the printed version, checking typos, for documentation and even for preparing interviews, asking the system for a battery of questions that they then filter.

AI is also being used in print journalism in Spain in business lines and marketing departments for the generation of advertising copy and creation of customized ads, translation to foreign versions, content planning in social networks, verification, audience analytics, generation of images and illustrations, and grammatical and SEO improvement of pieces through content analysis.

The Marfeel Compass application, used by most of these newspapers, performs a complete review of the texts to optimize their writing and grammar, and offers different headline proposals with an appropriate web positioning according to Google parameters. Tests are also being carried out in these newspapers for the transition from text to voice and the incorporation of the news narration option in the digital platforms, and in the video departments for the optimization of the editing and post-production processes.

The most imminent foreseeable incorporation of AI solutions in these media is related to the personalized recommendation of content; to the creation of simple texts derived from the pieces already created by their editors, such as summaries as a content preview; to the verification of facts and information; to the management and handling of social networks, and to the analysis of user behaviour to improve their experience in the digital proposals.

Diario *As* has already experimented successfully with the predictive analysis of results with a technology company using biomedical data, such as the kilometers travelled by a team, ambient temperature or injury history to provide an estimate of the probability of victory, which they believe could be interesting in the medium term to feed their articles. The current specific uses of artificial intelligence in the main printed newspapers in Spain are detailed in Table 7 below.

Table 7. Specific uses of AI in the main Spanish print newspapers

Outlet	Specific application of AI
El País	They have been working for years on optimizing routine and mechanical daily tasks with automated tools and algorithms.
	They use AI in the generic planning of content in social media, determining the best times to publish or scheduling the publication. Also to evaluate which photographs work best on the front page.
	Content analysis and evaluation (Marfeel Compass).
	They foresee the incorporation in the short term of personalized content recommendation or verification of fake news or AI-generated content.
	They do not believe they will resort to generative AI in the future.
La Vanguardia	Content analysis and evaluation (Marfeel Compass).
	Usage forecasts: content recommendation; creation of summary-style content on the pieces already created to optimize distribution and expand the formats derived from the pieces generated by your editors.
	They value the use of AI in content verification.
Marca	Use of generative AI for the generation of texts linked to the line of business (Bazaar).
	Use of AI in translation tests to foreign versions.
	Work on audience analysis.
	Content analysis and evaluation (Marfeel Compass).
La Voz de Galicia	They inform readers about the possibilities and limitations of AI through news reports.
	First approaches to optimize distribution.
	First tests with generative AI for the generation of texts with different points of view.
	Usage forecasting for the generation of parts based on structured data (TV listings, stock market, economy, weather or movie listings) and the processing of documentary information to optimize process efficiency.
AS	Trials with the company Narrative in 2019 for the generation of simple soccer chronicles.
	Testing with a technology company for predictive analytics of outcomes from biomedical data.
	Personalized recommendation, verification and evaluation of content is expected to be relevant in the medium term to optimize product and distribution.

Outlet	Specific application of AI
ABC	Tests with illustrations and AI-generated images.
	Internal testing to generate useful content such as weather forecasts or documentation to assist journalists.
	Prototype under development at Group level for text-to-speech to implement the news narration option.
	Freelance testing in the video department for the integration of AI applications in editing and post-production, and on the IT side.
El Mundo	Use of generative AI for the generation of texts linked to the line of business (Bazaar).
	Use of ChatGPT for translation, proofreading, text length adaptation, and documentation work.
	The incorporation of an automatic text production system is foreseen, with the intention of applying it to the electoral results.
El Correo	Use AI to improve and streamline processes, not to generate more content.
	Content analysis and evaluation (Marfeel Compass).
	Foreseeable use in simple mechanical tasks, such as some layout functions, optimization of graphic resources and photographs.
El Diario Vasco	Simple applications in the marketing department (copy ads).
	Ideas for the line of business in the planning phase (user behaviour analysis).
	Forecast of possible use in social media management.
Mundo Deportivo	Generation of simple texts with the intention of attraction (primitive results, weather forecast, chronicles of non-professional categories).

Source: Own elaboration.

CONCLUSIONS

The incorporation of Artificial Intelligence (AI) in journalism is a significant change that is integrated into all aspects of the development of the profession, although with variations in pace depending on the adaptability and acceptance of digital ecosystems in the newsrooms of different countries. However, progress towards journalism based on artificial intelligence and automated technology, or synthetic media, still presents challenges, as they do not arouse interest or economic sustainability in the professional sector (Ufarte-Ruiz *et al*. 2023), in addition to the ethical, legal and social risks and challenges arising from the implementation of generative AI, and leading to conflicts linked to veracity, authorship, transparency, accountability or influence on public opinion (Franganillo, 2023).

In the case of the Spanish press media, the main written newspapers are already considering the incorporation of algorithms and AI in all phases of

journalistic creation to automate mechanical tasks without human or creative input, in order to optimize their main routines and products. However, most of these newspapers discard in the short and medium term any generative use of final text creation as they consider them flat, simple and without sufficient differentiation, which would be detrimental to the quality standards that nurture their subscription model (Objective 1). Likewise, the development of automated solutions is advancing faster than the establishment of the necessary regulatory standards to avoid negative effects that could result in a violation of the privacy rights of individuals (Pedrero-Esteban and Pérez-Escoda, 2021), so that artificial ethics and the promotion of education about this technology seem to be key requirements to continue its establishment in society.

Within the scale of AI implementation, most newspapers occupy the second or 'initiation' level, with timid approaches to simple tools but without a defined strategy or sophisticated uses, while *El País*, *Mundo Deportivo* and *ABC* are at the next 'intermediate' point, as they show a greater progress in the integration of AI in their routines, or by resorting to more advanced application proposals.

In organizational terms, it is the technology, product or strategy departments that manage the AI resources and tools in the newspapers, although in the case of Grupo Prisa and Vocento, these applications pass through a first filter centralized in the strategy teams of the groups, while in Unidad Editorial they work with a specific AI Commission that reviews the needs of each business unit, and in Grupo Godó this responsibility falls directly on their own newspapers, which does not prevent joint solutions from being projected on an ad hoc basis (Objective 2).

At present, no professional profiles specialized in artificial intelligence are identified in the corporations, despite the fact that all of them have workers with the capacity to interpret and understand the new trends related to AI. In this line, they foresee a gradual and progressive training of their personnel as this technology is introduced more deeply into their structures (Objective 3).

The most frequent uses of AI in the Spanish press media are related to the business and marketing line, translation to foreign versions, planning in RRSS, content review, verification, analytics, and SEO positioning, while its use for personalized recommendations, predictive analysis, creation of simple texts on finished pieces as a summary, automated management and handling of content, and greater analysis of user behaviour and verification of facts and information are already valued and planned (Objective 4).

It will be interesting to monitor over the next few years to see if these media finally decide to produce artificial news with algorithms to amplify their coverage and capture specific niches, and to quantify the time it will take to consolidate in the newsrooms the new functions specialized in automation, as well as possible departments specifically dedicated to this technology.

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