Article

Artificial Intelligence and Journalism: Current Situation and Expectations in the Portuguese Sports Media

João Canavilhas (ID)

Department of Communication, Philosophy and Politics, University of Beira Interior, 6200-001 Covilhã, Portugal; jc@ubi.pt

Abstract: With an important presence in various sectors of activity, Artificial Intelligence has also reached journalism, mostly in the field of natural-language processing, in the detection of informational trends or in the automatic production of texts. The fact that sport is one of the first to test AI is not a coincidence: it is a subject in which there is a lot of information online and where data is essential, so it is simpler to resort to natural language processing to transform them in texts with little or no human intervention; this work sought to understand if Artificial Intelligence is already used in Portuguese sports media, but also in mainstream media sports sections, whether they are newspapers, radios, TVs or online natives. A survey was sent only to decision-makers, that is, editors and coordinators. The study seeks to understand to what extent journalists expect AI to help journalism, what are the greatest difficulties of its use and what threats it represents. We can conclude that Portuguese sports journalism is aware of the potential of AI, although for now it is not used in newsrooms due to economic and professional constraints.

Keywords: Artificial Intelligence; journalism; sports; newsrooms; Portugal

1. Introduction

The so-called "perfect storm" (Jukes 2013) experienced by journalism in the last 15 years is the result of the simultaneity of three phenomena: a technological revolution, the emergence of new unconventional information platforms and a global economic recession.

Plunged into an unprecedented crisis, media companies were forced to make spending cuts that, depending on the situation, took drastic forms. TVs closed some of their channels, newspapers suppressed paper editions by going exclusively digital, and in general, all media companies laid off professionals.

To compensate these cuts in human resources, some companies turned to technologies, because one of the goals of their introduction is to explore new opportunities (Hannan and Freeman 1984): and this is where Artificial Intelligence comes in. The possibility that some human activities can be done by machines, with economic and time gains, places AI as good alternative to answer the crisis that affects the sector, putting journalism in the fourth industrial revolution (Schwab 2016); this potential may worry journalists because it could mean more job cuts, but the truth is that AI can make their work faster, freeing them from routine tasks so produce articles with more quality (Galily 2018).

The use of AI in journalism can occur in the various stages of the news production process, from the search of news trends, (Steiner 2014), to the collection and organization of information (Diakopoulos 2019), the automatic production of texts (Carlson 2015; Lokot and Diakopoulos 2016) or the personalized distribution through recommendation systems (Helberger 2019). For this very reason, the vast field of application of AI has aroused the interest of journalists themselves, who in some countries positively accept its use in newsrooms (Thurman et al. 2017; Schapals and Porlezza 2020) not seeing it as a threat to their work (De la Torre 2020).

Although the interest in this area is growing, its use is still quite small. In part, because the implementation of AI projects is associated with investments, one of the areas most affected in periods of crisis; moreover, because there is a relative lack of knowledge regarding its potential, both among journalists and decision-makers. In this work we seek precisely to know what directors and editors of sports media think about AI: the choice of this sample is important because their decisions influence the way organizations face the adaptation of new technologies (Westphal et al. 1997). Our aim is to draw the current scenario in the adoption of AI in Portuguese sports newspapers, but also to understand what the expectations of these decision-makers regarding the use of AI in sports media are.

To this end, the paper seeks to answer three research questions. The first one seeks to know if the Portuguese sports media already use Artificial Intelligence. Knowing empirically that the usage is still low, as it is in other countries, the next question seeks to know in which kind of activities AI is used. Finally, the third research question tries to understand how decision-makers perceive the future support that IA can provide to sports journalism.

To contextualize the subject and answer these questions, this work begins by addressing the specificities of sport as a thematic area of journalism, also presenting the sports media offering in the country where the study took place: Portugal. In the next point, a brief historical review about the uses of AI in sports journalism is made with the purpose of presenting some fields in which it can be used, but also to justify the options used in the closed questions of the survey.

2. Specialized Journalism: The Case of Sports

Specialization in journalism can occur in two dimensions: in the type of medium (press, radio, television, Web) or in the content (Culture, Sports, etc.). About contents, the part that interests the scope of this paper, specialized journalism can be defined as that whose process of collection, processing and distribution of information concerns a specific area of journalism (Romano 1984).

Journalistic specialization is not a recent phenomenon: it was born after the Industrial Revolution, thanks to the technological advances that led to the increase of print runs to meet the growing demand for information (Álvarez Fernández and Aguilera 1989). In the first moment, newspapers tried to organize themselves into thematic sections to respond to the most demanding public, and this solution ended up working for decades. With the appearance of radio and television, the press was forced to look for weapons to fight against faster media and one of the solutions was to increase specialization to meet the audience's demands. Thus, specialized publications appeared, initially dedicated mainly to Culture, but later extended to Sports and many other areas.

The birth of the specialized press is, therefore, directly related to the emergence of audiences interested in specific themes and more demanding in relation to the rigor and depth as these themes should be reported (Berganza Conde 2005). With the emergence of online information and globalization, these audiences have gained an even greater scale, reinforcing the role of specialized newspapers and magazines.

Journalistic specialization necessarily leads to an increase in the quality of the final product because the journalists are experts in the field and the audience to whom the content is addressed is knowledgeable about these matters; however, sports journalism seems to be a special case as it is considered a soft form of journalism because it is dedicated to secondary issues and has little influence on society (Boyle 2017). Despite this, the importance of sports journalism is growing both in scale and intensity (Real 1998). In the first case with an impact on commercial success: in Portugal, the number of daily sports newspapers (A Bola, Record and O Jogo) is almost identical to the number of mainstream newspapers (DN-Diário de Notícias, Correio da Manhã, JN-Jornal de Notícias and Público). The case of television is also illustrative: the country has four generalist channels (SIC, RTP, TVI and CMTV) and three sports channels (SportTV, Eleven and Canal11); it should also be

noted that the presence of sports, especially soccer, on the generalist channels is increasing and that the largest sports clubs in the country also have their own TV channels.

In part, the criticism directed at sports journalism is more related to the commentary than to the activity itself. The growing presence of opinion-makers on television, and the heated discussions that occur there because they are representing clubs, is one of the reasons for this decrease in the prestige of sports journalism, but the truth is that these commentators are not specialists. Another common criticism is the association of newspapers to certain clubs, a situation that would condition their evaluation, but this situation is similar in other areas without the same criticism. In fact, the similarities between sports journalism and other specialties are more than the journalists themselves admit (Boyle 2006), but because it is a sport, it ends up involving more emotions (Real 1998).

Regardless of all the criticism, sports journalism is an activity whose production and distribution process are identical to that of general journalism, and so are its technical needs, being sometimes more demanding due to the growing variety of existing sports.

3. Sports Journalism and Artificial Intelligence

The excess of information received in newsrooms and/or the lack of human resources has led journalism to look for solutions to maintain its information flow, despite the cuts in the newsrooms. One of the solutions found was the automatic production of texts, also called "algorithmic journalism" (Dörr 2016) "robot journalism" (Kim and Kim 2018) or "automatic journalism" (Graefe 2016).

Regardless of the name by which this process is known, we are talking about the use of computer systems to transform structured data into texts, and that's why robot journalism is in use mainly in areas where data is a determining factor, such as Economics and Sports (Dörr 2016). The case of sports is especially appetizing because there is a lot of statistical data to feed the algorithms (Lewis et al. 2019) and where it is possible to use a variety of templates easily adaptable to the results (van Dalen 2012); hence, it is not surprising that sports journalism has pioneered the use of Artificial Intelligence in the process of news production.

3.1. Journalist's Perceptions about IA

Although the scientific production on Artificial Intelligence in journalism has increased in the last four years, studies on journalists' perceptions regarding the use of AI are still scarce. For this work we selected some studies that have sought answers to questions such as those in this paper.

In a study with 10 journalists, three of which were sports journalists, Thurman et al. (2017) found that professionals did not like the texts produced by the software, with one sports journalist pointing out the lack of analysis, context, and expert quotes. Despite this, sports journalists considered that AI will be a good aid for their work, giving as an example the data processing to identify subjects with interest or the increase in the speed of content production.

In another study, this time with a sample of 366 Spanish journalists, Túñez-López et al. (2018) sought the opinion of these professionals regarding the use of AI in journalism. In the parts that are of interest to this work we highlight the recognition by journalists that the application of AI will allow for increased production, decreasing production costs. Still, most say that AI could be applied in news distribution, while only 21.3% mention its usefulness in content production; furthermore, noteworthy is the ease in data processing, an option pointed out by 30% of respondents.

In a report produced by the London School of Economics and Political Science (Beckett 2019), researchers interviewed 71 professionals from 32 countries, including Portugal, and concluded that journalists believe that AI can help them produce more and better information, thus helping in the economic sustainability of the media and regaining trust with the public. Despite this, respondents recognize that the implementation of AI implies heavy investments, both in emerging technologies and human resources, which hinders

the process. Among the many data collected, we highlight those that coincide with the present study. About the advantages of using AI, the reasons most mentioned were to make journalists' work more efficient (68%), to deliver more relevant content to users (45%) and to improve business efficiency (18%). Regarding the future, respondents expect AI to help journalists in data extraction and information gathering, automatic content production and personalized content distribution. A note should also be made that respondents consider the collaboration of universities in the development processes of AI in the media to be fundamental.

In a recent study, Lara-González et al. (2022) interviewed 21 professionals from various Spanish media and concluded that in 50% of the cases AI is already used, although mostly in experimental projects related to trend forecasting and decision making, content generation and development of tools to support journalistic work. Regarding the future, the interviewees consider that AI will help process large amounts of data, which will help both in the search for trends and in the fight against misinformation and will also be a support for journalists, who will be able to free themselves from routine tasks to instead devote themselves to research.

The last reference is a study developed in four countries (the USA, UK, Germany and Spain), in which Noain-Sánchez (2022) interviewed journalists, media experts, and academics about the use of AI. Among the various conclusions, there is the recognition that journalists and the media can benefit from AI: the former because they are freed from repetitive and routine tasks, and the latter because they gain efficiency, producing more with fewer human resources. Regarding the areas in which AI should be applied, the interviewees highlight automated content production and personalized distribution. As for the future, the interviewees emphasize the obligation to always have human beings supervising the content produced by the algorithms and stress the need for universities that train journalists to teach the principles of AI.

3.2. AI in Sports Journalism: Some Experiences

One of the first experiments in the field of sports news automatic production occurred in 2010, the year that The Big Ten Network launched a service using software from Narrative Science (Lohr 2011) that automatically produced baseball news using statistical data (Latar 2018).

Still in the field of automated production, in 2016, the Associated Press (AP) started covering Minor League Baseball (MLB), tracking the results of 142 teams spread across 13 state leagues. Instead of the hundreds of journalists it would take, AP turned to Wordsmith software from Automated Insights to automate news production based on the statistical data received. To make the automated texts make sense, the AP's sports editorship tested the software for a year (McCormick 2016).

But the use of Artificial Intelligence does not only happen in automatic text production, although this is the one that has had more visibility.

In Brazil, the portal UOL has been using AI in several areas of journalism and in the field of sports. Since the end of 2017, they are producing news using a robot, but AI also helps choosing the most searched words (Google Trends) to use in the news and in the titles produced by journalists, in the places where videos and photos should enter in online news, and even in the best times to publish or republish the news.

Comment moderation has been another area where AI has been used, and sports is probably the section where there are the most comments. In 2019, the Spanish newspaper El Pais implemented an online system where comments started to be watched by the Perspective API, a free application developed by Jigsaw. If someone posts a comment considered "toxic," the system warning the author to change the text, not publishing until this occurs. In parallel, they used a system to analyze sentiment and look for toxicity relationships between authors, texts, and comments (Delgado 2019).

Also in 2020, Reuters, together with the company Symthesia, launched the first fully automated news summarization service driven by a virtual and programmable presenter,

but with a human-like image. The content included videos, photos, live game data, and commentary, without any human intervention. (Chandler 2020).

Back to automatic text production, the Dutch local media group NDC, which in 2021 started using robots in the production of sports news related to amateur soccer, proposed to cover 60,000 games in a season. To achieve this goal, NDC turned to Swedish technology company United Robots: the company has developed an algorithm based on crowdsourcing that combines structured data provided by soccer associations with information sent by coaches or officials in response to a message sent by the system. NDC believes that the automatic production of texts about amateur soccer will make it possible to cover games that generally lack media attention, which will attract an audience for free content that will in time become subscribers (Rizzoli 2021).

This set of experiments is just a small sample of what Artificial Intelligence already does in sports journalism, but what is the situation in Portugal? That's what we will see next.

4. Methodology

This paper seeks to find out whether AI is used in Portuguese sports media, what are the biggest obstacles to its use, and what are the expectations of the decision-makers. Three research questions were prepared: RQ1: Do Portuguese sports media already use Artificial Intelligence? RQ2: In what kind of activities? RQ3: How can AI help journalism in the future?

Methodologically, we use a survey, a technique composed of a set of processes that aims to obtain data based on the information provided by a representative sample of the object of study (Cea D'Ancona 1992; Bosh and Torrente 1993). First of all, a survey of the Portuguese sports media decision makers was carried out. Twenty-five media and one news agency were identified: general information newspapers (Correio da Manhã, Diário de Notícias, Expresso, Jornal de Notícias, Jornal I, Público), sports newspapers (A Bola, O Jogo, Record), radio stations (Antena 1, Rádio Renascença, TSF), generalist televisions (RTP, SIC, TVI, CMTV), sports televisions (Canal 11, Eleven Sports, SportTV), native online (Bancada, pt, Futebol 365, Maisfutebol, Observador, Sapo, ZeroZero) and the news agency LUSA.

The questionnaire, which used some options previously tested in the London School of Economics and Political Science report (Beckett 2019) was divided into four parts, A hybrid model was chosen, with groups of closed questions, and using Likert scales, although some answers were not used in this work. The first group of three questions was related to the characteristics of the participants, namely gender, age, and the media in which they work. The second group of multiple-choice questions sought to find out whether AI is used in the media and, if so, in what activities, since when and for what purpose. The third group of questions used Likert scales to find out to what extent editors think AI can help journalism, and ten activities that are part of the news production process were suggested. The fourth and last group of questions, again a closed multiple choice, sought to find out the obstacles to the implementation of AI in sports, but also the editors' expectations regarding its use.

Sample

This work is an exploratory investigation, which does not intend to reach generalizable conclusions, but rather to contribute to consolidate the scientific production on the subject. We chose to collect information from media editors and coordinators because they are the decision-makers, i.e., the ones that advise publishers on technology strategies and this is a study that seeks to know the current situation, but also to anticipate what might happen in the future. The contacts were collected from the media websites and reaching a universe of 55 potential participants. The emails were sent between September and October 2021. One address rejected the emails, one of the respondents declined the invitation for "not knowing anything about new technologies" and two were general emails from the publication and no response was obtained. Whenever possible, editors who did not reply to the emails

were also contacted through social networks. The universe was thus reduced to 51 contacts from which 32 responses were obtained (response rate: 62.7%).

A first observation is that women (9.4%) are still under-represented in sports journalism, especially among the decision-makers; this data is worth mentioning because nowadays women are already the majority of journalism students. In terms of age (Figure 1), groups above 40 years old total about 72%, which is not strange given that the respondents are editors/directors, positions that are rarely occupied at the beginning of a career.
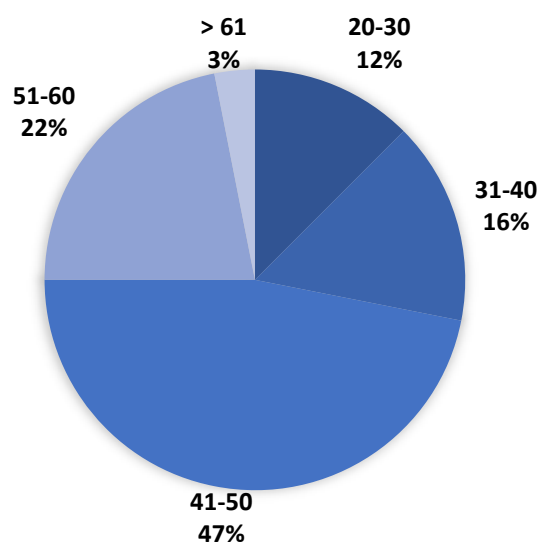

Figure 1. Age distribution.

All media present a similar age distribution, which contradicted expectations as it was expected that online media would have a much lower average age.

In the answers by media (Figure 2), sports television (28.1%) stands out, followed by sports newspapers (25%) and native online publications (18.8%), in the latter case because they are mostly sports websites.
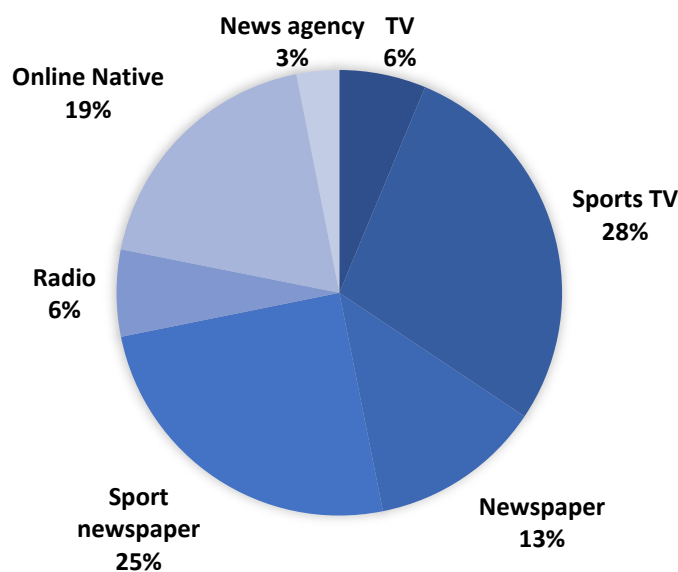

Figure 2. Media distribution.

These data are considered normal because we are talking about specialized sports media, having, therefore, a greater number of editors: usually, in the mainstream media, there is only one editor.

5. Results and Discussion

The first question sought to know to what extent the Portuguese sports media, or the sports editors of the generalists, use Artificial Intelligence. The answers show that only in 34.4% of the cases this already happens. Questioned about the activities in which it is used (Figure 3), 54.5% answered that it is in archive search, 45.5% in data processing, and 36.4% in the automatic production of texts.
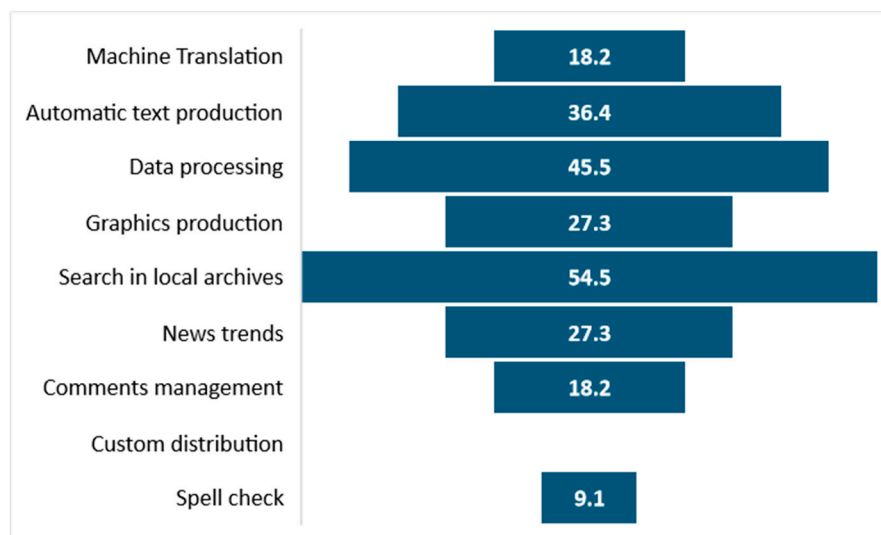

Figure 3. AI uses in the newsrooms.

The fields in which AI is most used in Portugal are considered of low complexity and have been on the market for many years. The third one—the automatic production of text—is more demanding and has one of the most successful uses.

Since it is an anonymous survey, we cannot link the answers to a specific media, only to their typology. Even so, it is possible to verify that online native users are the ones who most use AI in newsrooms, especially for the automatic production of texts; it should also be noted that only one mainstream media claim to use AI. The first use of AI in Portuguese journalism seems to date from 2010 and started in a newspaper. The first use of algorithms for automatic production of texts occurred in 2015 in a native online, however there are more recent experiences (2019 and 2021) in sports newspapers.

When asked about the reasons that led to the adoption of Artificial Intelligence (Figure 4), the most mentioned were saving time and making the journalists' work more efficient. The answers confirm trends obtained in previous studies (Thurman et al. 2017; Schapals and Porlezza 2020) and prove that the use of AI seeks to increase productivity.

Looking for a correlation between the uses of AI and the reasons for its use we find that: (1) machine translation is associated with timesaving, automatic production of texts, research (news trends and archives); (2) automatic spelling correction of texts are associated with the more efficient work of journalists; (3) the production of graphics is associated with the delivery of more relevant content. Interestingly, audience involvement in the news process appears associated with almost all uses.

Finally, participants were asked about the importance of AI in supporting journalism, using a scale from 1 (not important) to 10 (very important). The average achieved is 7.2, with a mean deviation of 1.5. In terms of age (Figure 5), the group that gives most importance to IA is those over 61, but this result is misleading because the sample only had one participant of that age. Thus, the age group 31–40 is the one that most recognizes the importance of AI in journalism and the most skeptical are the age group 51–60, though the difference is not significant.
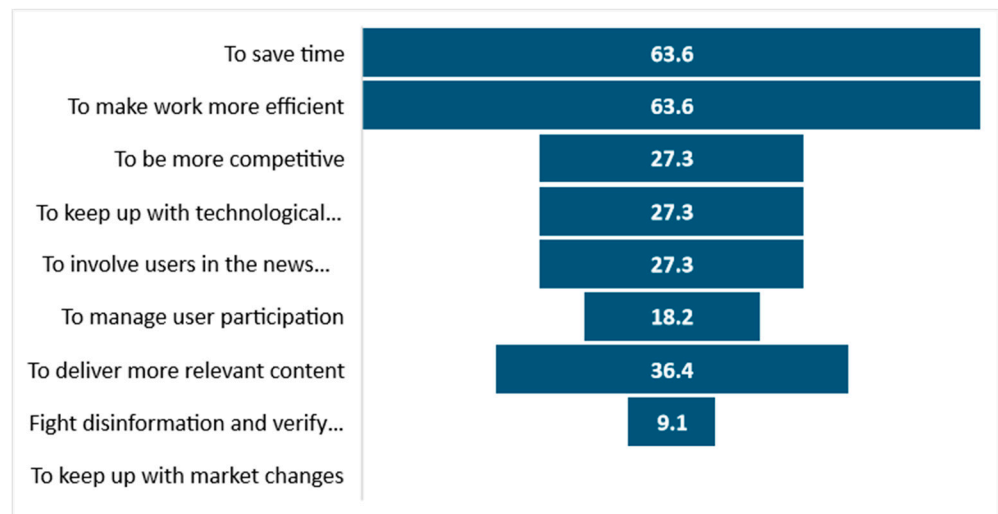
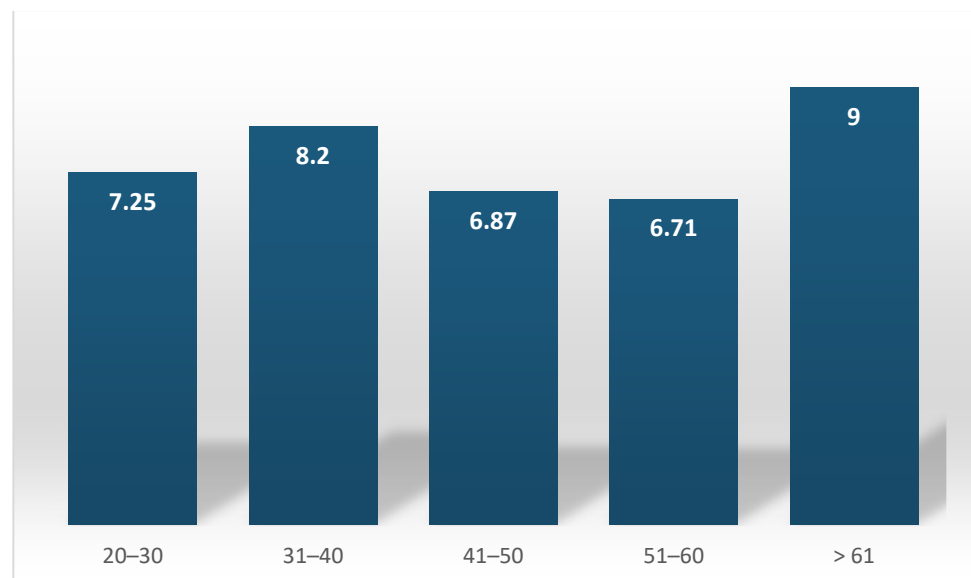**Figure 4.** Reasons to the use of AI in the media.

Figure 5. How AI can help journalistic work (scale: From 1 to 10).

In the analysis by media (Figure 6), those who most value the role of AI in journalism are native online media professionals (8.17), followed by news agencies, but we should not overestimate this second fact since there is only one news agency; this trend is natural because online natives are the media where technology has the strongest presence in the entire production process.

The results are within expectations since online natives are also the ones who use AI the most. Another interesting fact is that editors of specialized media value AI more than journalists of mainstream media. In the case of TV, the average is 6.8 versus 3.5, while in print it is 7 versus 6.75.

The participants were also asked about how they foresee AI helping journalism in the future (Figure 7).
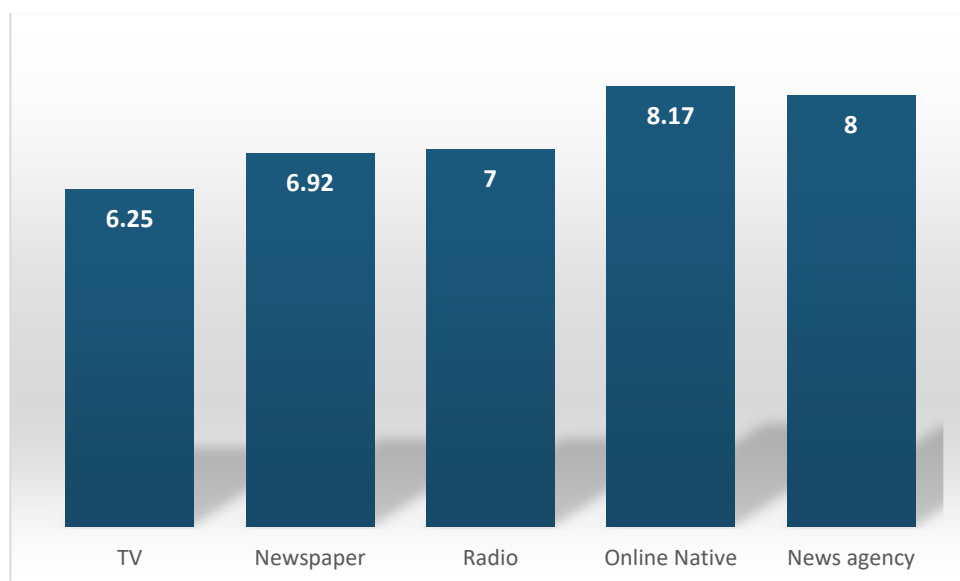
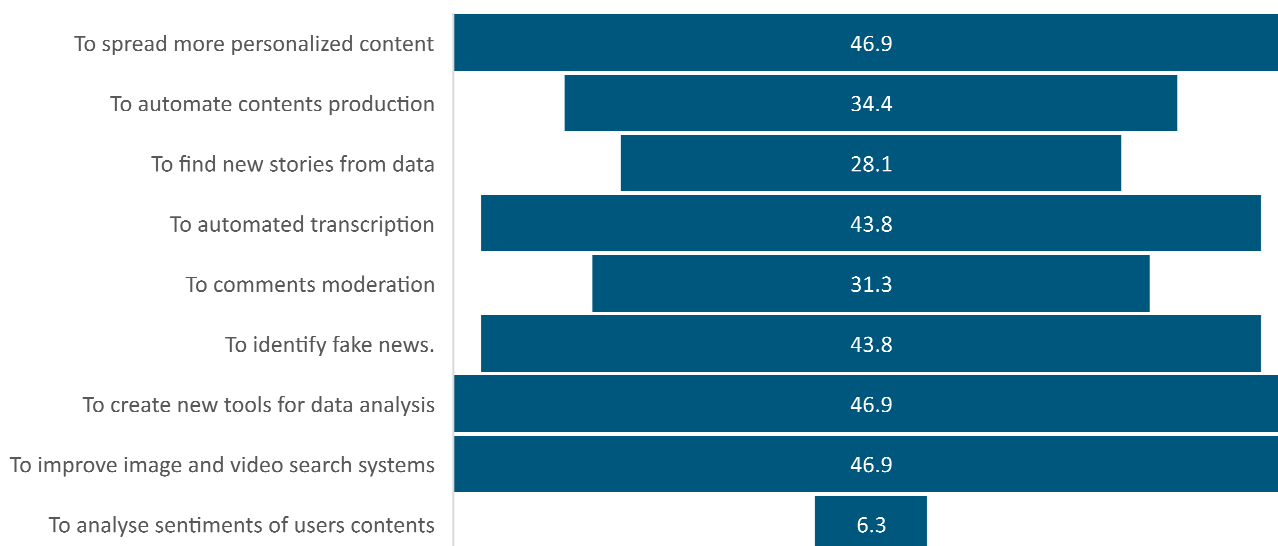**Figure 6.** How AI can help journalistic work (scale 1 to 10).

Figure 7. How IA can help journalism in the future.

Having this expectation in relation to the use of AI, we tried to find out why most of the media does not use it yet. The lack of financial resources (59.4%), some lack of knowledge about its potential (56.3%) and ethical issues (31.3%) are the reasons most pointed out by decision makers in sports media, nothing that the ethical concerns are related to the automatic production of texts. Another interesting fact is that editors of specialized media value AI more than journalists of generalist media. In the case of TV, the average is 6.8 versus 3.5, while in print it is 7 versus 6.75.

6. Conclusions

This paper aims to know if the Portuguese sports media are using Artificial Intelligence, why they do it and what expectations they have about future uses.

Concerning the first research question, the data shows that AI is still little used in sports media (34.4%), a lower value compared with Spain where 50% of the media already use AI (Lara-González et al. 2022). The media that uses AI do it to support journalists' work, making them more efficient, something that confirms data obtained in other studies

(Túñez-López et al. 2018; Beckett 2019; Lara-González et al. 2022). This identifies a relationship between AI and productivity, something common to other sectors of the economy. The notion that AI increases productivity does not seem to be enough for companies to invest in this area, since the lack of financial resources is the reason most often mentioned for its reduced presence in sports media; this apparent contradiction—AI makes work more efficient by freeing up resources, but not enough to lead media to invest in it—may also be related to the assumed lack of knowledge regarding its potential a trend already found in studies conducted in other countries, especially among journalists (Noain-Sánchez 2022).

About the activities in which AI is used in Portuguese media, the second research question, the results show that it occurs in activities of low complexity, like research in archives and data processing. The automatic production of texts, one of the possibilities with the most potential, appears in third place, but only an online native stands out in this field.

Finally, the third research question sought to know in which areas AI can help sports journalism, and decision-makers recognize that in the future AI will be a valuable aid to journalistic work. The higher expectations are placed on data analysis, multimedia content search, personalized content distribution, machine translation, false information detection, and automatic text production. If the automatic production of content and data processing was something expected because they are the areas with the highest visibility, it was surprising to see the importance given to personalized distribution, something that appears in three of the five studies referenced in this work; this seems to indicate that decision-makers seek to imitate the distribution models used by social media algorithms, which shows their attention to online trends. The weak presence of more complex applications is related to the lack of financial resources pointed out by six out of ten respondents, since the small size of the IT teams would force them to buy this service from external companies. Perhaps because of this, 97% of respondents believe that higher education institutions can play an important role in the study and development of Artificial Intelligence solutions for newsrooms; this approach between universities and the media has also been identified in other studies (Beckett 2019) that advocate the integration of AI in teaching programs.

A limitation of this study was the impossibility of confronting decision-makers with the conclusions and looking for explanations for some trends; this limitation is related to the anonymity of the questionnaire, something that was important to obtain more responses. In future investigations, the results will be presented to decision-makers, whether or not they participated in this study, to clarify some doubts arising in the interpretation of other data from this study not used in this work.

Institutional Review Board Statement: Ethical review and approval were waived for this study because the participants are not identified.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: These data can be found here: shorturl.at/nSUX4.

Conflicts of Interest: The author declares no conflict of interest.

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