



RESEARCH ARTICLE

2024, vol. 11, issue 2, 102 - 108
<https://doi.org/10.5281/zenodo.#>

MAPPING AI IN THE NEWS MEDIA SECTOR - TECHNOLOGICAL DISRUPTION IN PRACTICES OF JOURNALISM

Georgiana Silvia LEOTESCU

Lecturer, PhD, Department of Education and Communication Sciences,
University of Craiova, Romania, georgiana.leotescu@edu.ucv.ro
<https://orcid.org/0009-0001-5422-9244>

Abstract

This study draws upon existing literature on the emerging technologies and the impact of their implementation on news media, with a particular focus on investigating how new developments of artificial intelligence (i.e., generative AI) are responsibly incorporated in newsrooms to support journalism in the digital age. It aims to survey the field by highlighting policy frameworks provided for good journalistic practice coming both from external relevant actors seeking to ensure a sustainable development of journalism, and from newsroom leaders and journalists alike in their pursuit to navigate the challenges posed by human-machine interactions in news gathering, production and distribution. Key implications especially in connection to AI regulation provided from the news media industry itself are discussed in an attempt to identify and extract the existing practical guidelines. Our findings suggest that not only UNESCO, but also the Council of Europe have concentrated on providing recommendations on the ethics of AI, in general, and on the responsible use of AI in newsrooms facing the ongoing digital transformation, in particular. Additionally, results shows that the UK's largest public service broadcaster, the BBC, is determined to prove its commitment to research and development, especially in maintaining its role among other large news organisations (such as Bloomberg and Wall Street Journal) in leading the adaptation of AI.

Keywords: artificial intelligence, media industries, newsrooms, journalism, regulation, public interest, the BBC

1. Introduction

The world we are now living in is, undoubtedly, technologically driven, with automation levels increasingly developing and gradually confirming Alvin Toffler's predictions about the impact of these ongoing digital transformations on society as a whole. As people working in various fields begin to grapple with the challenges of this "digimodernist era" (Kirby, 2009, p. 28), the famous futurologist's views are now more than ever signaling that adaptation becomes paramount: "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn." (Toffler, 1970). Following the third wave of the revolution marked by breakthroughs in technological advances such as the computer, the fax or the cell phone, humanity is now facing the challenges posed by other innovations of the fourth stage in which automation and Artificial Intelligence play a key role.

The integration of automated tools and AI is visible in many sectors, ranging from transportation, healthcare or manufacturing to finance, customer service or education. Predictably, the news industry has also adopted AI for the creation, conception and circulation of news products, as well as services. The potential of far-reaching technological advances in journalism is visible, as subfields of AI are being developed in the news media in order to reduce costs and make journalism easier in newsrooms. According to Mathis-Felipe de-Lima-Santos and Wilson Ceron, there are seven subfields of AI that can be taken into consideration when analysing the use of AI in the news industry: "(i) machine learning; (ii) computer vision (CV); (iii) speech recognition; (iv) natural language

processing (NLP); (v) planning, scheduling, and optimization; (vi) expert systems; and (vii) robotics” (de-Lima-Santos & Ceron, 2022, p. 13). Their research indicates that machine learning, computer vision, and planning, scheduling, and optimization are the most commonly used types of AI in the news media.

2. Theoretical framework

2.1. Mapping AI in a digital age

In the second edition of *Understanding News Industries* published by Oxford University Press (2017), Havens and Lotz underpin three levels of influence as part of larger framework that they propose to explain the operation of media industries. Thus, in their unique approach to explain how media industries work, they speak about mandates, conditions and practices that influence the “Industrialization of Culture Framework”. Among these, we signal two important conditions that the authors reveal as they become highly relevant in connection to large-scale media operations in the digital age. The first one that they refer to is *regulation*, understood as “the legal rules within which media companies operate” and categorised in terms of “content, industry structure, or technical standards.” The authors emphasise the continuous adaptability that should be sought in this field, since some regulations “have developed to deal with the particular social and political features of media” (Havens & Lotz, 2017, p. 26). The second condition that plays a significant role in media industry operations is connected to *economic norms*, especially in recent years due to some major changes such as “the steady conglomeration of many different kinds of companies under a single corporate umbrella, and the consolidation of ownership into a handful of global companies”.

Finally, the third condition the authors mention is the available *technology*, drawing on its effects on multiple areas and providing relevant examples that contribute to the significance of our present study: “Technology can affect how professionals produce media and change a media industry from previous norms, as in the case of digital publishing and recording equipment. Technology can also affect the distribution of media, as in the case of Internet music distribution that expanded piracy and ended the dominance of the album as the primary unit of music sale, which in turn forced adjustment of traditional music industry economic models. Technology also governs how we access media, enabling us to freely move content among various devices, which has led to entirely new ways of using media.” (Havens & Lotz, 2017, pp. 26-27). In an editorial published in 2020, Ni Made Ras Amanda Gelgel sensibly addresses the impact of automation and the ubiquitous presence of information and communications technology (ICT) in various fields, signalling the advancement of technology as a threatening outcome for journalism: “Will technology take over Journalism?”

Nevertheless, in order to understand the increasing interest of the deployment of AI in the media industry, it seems worthwhile to provide a set of definitions regarding the concept of AI itself. The objective is to discover the potential of AI tools in the context of journalism and determine the reasons why technological innovations and the implementation of AI are accelerating in newsrooms. From a narrow perspective, AI represents “a branch of computer science focused on simulating human intelligence” (Broussard et al., 2019, p. 673). For this reason, there are troubling implications, as audiences might easily be confused and not be able to distinguish a human-written piece of news from an AI-generated text. The definition provided by Brennen et al. (2018) underlines the same risks that can be encountered since AI consists of “a collection of ideas, technologies, and techniques that relate to a computer system’s capacity to perform tasks normally requiring human intelligence.” Programming machines to follow instructions in a certain way is also a central idea when defining AI as “the study and construction of agents that do the right thing” (Russell & Norvig, 2021, p. 22).

Other scholars emphasize the benefits of automating routine tasks, thus facilitating journalists’ work through smart tools: “we understand AI as a set of approaches and methods that, given data and an objective, are able to build a model, that allows the system to generate predictions or decisions for a particular set of tasks.” (Bailer et al., 2022, p. 2). Furthermore, they underline the growing number of media managers (almost 70%) for which AI becomes a crucial technological advancement in their businesses according to a survey conducted in 2021 by the Reuters Institute for the Study of Journalism. In the same year, the “Recommendation on the Ethics of Artificial Intelligence” is provided by UNESCO and endorsed by 193 Member States. From this perspective, “AI systems are information-processing technologies that integrate models and algorithms that produce a capacity to learn and to perform cognitive tasks leading to outcomes such as prediction and decision-making in material and virtual

environments. AI systems are designed to operate with varying degrees of autonomy by means of knowledge modelling and representation and by exploiting data and calculating correlations” (UNESCO, 2021).

2.2. The development of AI in the news industry

Besides various definitions that have been provided since the term was first coined in 1956 (at Dartmouth College), various taxonomies of AI also prove to be useful when discussing their role in the context of journalism. As such, if we refer to “computer systems that have specific intelligence allowing them to perform specialized tasks”, we speak about *applied* or *narrow AI*. These types of systems designed to pursue specific, singular or limited tasks were perceived as a familiar type of AI in 2019 (Mitchell, 2019, p. 45f). Concurrently, “computer systems that are or are intended to be generally intelligent, just like human beings”, with capabilities to reach even superintelligence (a recurrently examined concept among philosophers and science fiction writers), represent *general AI*. The concept is used interchangeably with the acronym AGI (artificial general intelligence). Research shows that elusiveness still characterizes this type of AI (Larson, 2021; Smith, 2019), since “most public expectations overestimate the power of AI while ignoring its limitations and the preconditions for its successful application” (Jungherr & Schroeder, 2023, p. 164). The distinction between narrow AI and the so-called artificial general intelligence (AGI) signals the possibility of AI-based systems to reduce the humans’ role and perform tasks autonomously. From a functional perspective, it is worth mentioning that “journalists do not often *use AI* in the sense of applying/deploying it (except for a tiny elite of journalist-developers who create ML models), rather they use outputs of software and systems that incorporate AI - relying on decisions they make, which are communicated via user-facing dashboards and interfaces” (Jones, B., Jones, R. & Luger, E., 2022, p. 1735).

By far, the most problematic AI-based systems that have raised concerns regarding factual correctness but also authorship are the generative models, as they are able to produce varied media content (texts, images, audio) based on a set of commands. As such, the output of AI is guided by specific instructions (input) or prompts given by users, thus demonstrating the technological developments in enhancing AI-human communication. Basically, generative models represent a branch of general purpose AI which excel at automated content generation and are also recognised as foundation models. One of the most well-known generative AI models is the fourth multimodal large language one created by OpenAI which outperforms the famous ChatGPT. Besides GPT-4, there are other cases of LLMs (large language models) that are used for the same purposes such as BERT (Bidirectional Encoder Representations from Transformers) developed by Google. Last year, Meta (Facebook) also introduced its own foundation LLM called LLaMA. Apart from chatbots or voice assistants that can answer to prompts (albeit sometimes in a misleading way), there are also applications which are able to create images based on written prompts. DALL-E is one of the most famous text-to-image systems, but other examples such as Midjourney or Stable Diffusion rely on the same principles.

3. Methodology and research objectives

Our research is fuelled by the possibility to conduct a meaningful secondary analysis on the implementation of artificial intelligence in the news media industry, thus exploring, selecting and reviewing previously collected data on the matter at hand. Based on the data collected, we endeavour to address the following questions:

RQ1: What kind of documents regulating the use of AI have been developed in recent years, given the ubiquitous rise of AI-based systems, in general, and of generative models, in particular?

RQ2: What implications does the incorporation of artificial intelligence systems in journalism have for news media organisations and their mandate to live up to professional standards?

RQ3: How is AI deployed in media outlets which serve public service journalism and what type of guidelines have been proposed within the news industry itself to ensure responsible integration of AI systems in journalism?

4. Analysis

Taking into consideration all the recent AI developments not only in regards to the mainstream use of generative AI, but also in terms of automation in general, policies and governance frameworks have become paramount especially in connection to news organisations and journalists, since “generative AI is not committed to truth in the content it creates, only plausibility; there is no guarantee of factual correctness. In fact, a lot of AI-generated information will be false and misleading, while at the same time seeming perfectly plausible.” (Jungherr & Schroeder, 2023, p. 169). Before we explore the guidelines provided by leading organisations that have focused

on providing a set of principles to regulate the use of AI in newsrooms, it is worthwhile to pinpoint the most important initiatives agreed on by high-level authorities in terms of AI regulation on a larger scale.

The European Ethics Guidelines for Trustworthy AI presented in April 2019 by the High-Level Expert Group was the first and most comprehensive publication of guidelines, signaling the “lawful”, “ethical” and “robust” characteristics that trustworthy AI should possess. One month later, the OECD (Organisation for Economic Co-operation and Development) adopted the first intergovernmental standard on AI – the Recommendation on Artificial Intelligence (AI). It postulated as its main aim “to foster innovation and trust in AI by promoting the responsible stewardship of trustworthy AI while ensuring respect for human rights and democratic values”¹. Two years later, UNESCO released its first-ever global standard entitled *Recommendations on the Ethics of Artificial Intelligence*, proving its commitment “to ensure that science and technology develop with strong ethical guardrails for decades.”² On the 5th and 6th of February 2024, the Global Forum on the Ethics of AI will be organized by Slovenia under the patronage of UNESCO.

UNESCO has also got an International Programme for the Development of Communication as part of its journalism education series. Aiming to provide insight into the rise and control of AI, UNESCO supported the World Journalism Education Council in commissioning a valuable handbook in 2023. In *Reporting on Artificial Intelligence: A Handbook for Journalism Educators*, Frederik Heintz states that according to a study conducted by the OECD AI Policy Observatory, which has collected over 700 AI regulations imposed by more than 60 countries, the US and the UK are the countries with the most AI policy initiatives.

Prior to the end of 2023, the Council of Europe released the “Guidelines on the responsible implementation of artificial intelligence systems in journalism”, which were adopted by the Steering Committee on Media and Information Society (CDMSI) on 30 November 2023. Thus, with the new policy framework, additional sectoral guidance is available, narrowing the earlier recommendations that were much global in scope. For example, the discrepancy between an artificial intelligence system and a journalistic artificial intelligence system is clearly stated, as the latter is “directly related to the business or practice of regularly producing information about contemporary affairs of public interest and importance, including the research and investigation tasks that underpin journalistic outputs”. Furthermore, the definition underpins that “this can include, but is not limited to, large language models and generative AI when used for journalistic purposes and/or news organisations”, reinforcing, at the same time, that these systems “are not a single technology but a range of different, often interlinked, tools for automating specific tasks” (CDMSI, 2023, p. 3).

In addition to all the previously enumerated guidelines, regulations have also been provided from within the news media industry itself. The phenomenon is of utmost importance in signaling not only the ethical, but also the social challenges that news organisations are faced with especially in using generative AI. One of the most respected mainstream news media outlets in the UK and also one most highly trusted sources of news worldwide, the BBC, has undertaken solid projects in providing high-quality news coverage. According to the information provided by Charlie Beckett in the Foreword written for a handbook published under UNESCO Series on Journalism Education, the BBC is one of the large news organisations leading the adaptation of AI, alongside Bloomberg and Wall Street Journal (Beckett in Jaakkola, 2023, p. 14)

At the same time, the BBC has also concentrated on developing next generation systems through a responsible implementation of innovative technologies and unyielding commitment to meet the highest standards for its journalism. As such, BBC Research and Development department has been functioning since 1922, with engineers, scientists, ethnographers, designers, producers and innovation professionals seeking “to provide a *centre of excellence* for research and development in broadcasting and the electronic distribution of audio, visual and audiovisual material”³. Predictably, one of the main topics that BBC Research and Development (abbreviated R&D henceforth) has concentrated on, particularly in its mission to inform and educate, is Artificial Intelligence and Machine Learning. At the time this research is conducted, the activities connected to AI and machine learning are conducted by BBC R&D across 19 projects: Responsible innovation and society, Data Science Research Partnership, Making AI More Understandable, Intelligent Audio Production Tools, Intelligent Video Production Tools, Visual Data Analytics, Responsible Machine Learning in the Public Interest, AI in Media Production, Speech-to-Text,

¹ OECD, *Recommendation of the Council on Artificial Intelligence*, OECD/LEGAL/0449, p. 3.

² <https://www.unesco.org/en/artificial-intelligence/recommendation-ethics>.

³ <https://www.bbc.co.uk/rd/about/our-purpose>.

Multimedia Classification, KiWi, MyMedia, Mood Metadata, Making Musical Mood Metadata, COMMA, Highlights, Natural language processing, CODAM and, last but not least, Editorial Algorithms.

By accessing the information provided on its official homepage, we can acknowledge that *Responsible innovation and society* is the most recent project which started in 2023. Since some of its main areas of focus are public values, data and AI, it provides full access to an investigation conducted on generative AI and journalism, published in 2023 by the Edinburgh Research Explorer (a public repository of the research activity conducted by the University of Edinburgh) in collaboration with BBC R&D. The study is centred precisely on ensuring a better understanding of how generative AI is impacting news gathering, production, distribution and consumption. Additionally, it features a concise but valuable risk-based assessment, from editorial, legal and societal perspectives.

As part of its efforts to provide a basic literacy in AI, on the 7th of September 2017, the BBC also made a public commitment to outlining the principles of AI systems in general, and machine learning systems, in particular. The document, BBC – Written evidence (AIC0204)⁴ can be accessed after a close reading of the information provided for the third project – Making AI More Understandable. Relying on its confirmed competencies in digital research and development, the BBC pinpoints the following four principles which guide its mandate in accordance with its core values and own AI services: independence, impartiality, accountability and universality. Furthermore, the BBC proposes that this set of principles can be incorporated in other organisations besides those serving public service journalism.

In the last part of the document, the national broadcaster emphasizes three ways in which it expects to contribute to a responsible incorporation of AI technologies, with no political or commercial interests besides those of its audiences. Firstly, the BBC aims for *Informing the Debate*, thus providing substantial and useful coverage of AI-related topics connected to various fields (transport, retail, law, healthcare etc.). *Bringing Partners Together* is the second method to be used in order to engage multiple actors (businessmen, academia, etc.) in exchanging knowledge and fostering debates that positively shape the public understanding about AI. The Data Science Research Partnership serves as a clear example of specialist partnerships, alongside conferences and symposia organised with the same purpose. Lastly, the BBC seeks to encourage *Responsible Technical Development*, especially in the context of a “centre of excellence” for research and development which has been functioning for decades.

Thus, in terms of responsible implementation of AI technologies in journalistic practices, the UK’s largest public service broadcaster admits that it has adopted a “relatively utilitarian” approach, with image recognition, speech to text and content analysis serving as essential AI services. Nevertheless, the BBC upholds that “personalisation” plays a key role, underlining the importance of its Research & Development department in cautiously navigating editorial processes through machine learning (AIC0204, 2017, p. 7). In a recent study focusing on AI deployment in BBC news production, researchers claim that “much of the development and application of AI for news [...] has taken place within BBC News Labs, an innovation-focused unit founded in 2012, combining technical and editorial staff to experiment with news products and services and proto-type proof-of-concept systems that may transfer into day-to-day news operations.” (Jones, Jones & Luger, 1740-1741). Although the authors state that machine learning (ML) models are seldom built in News Labs, they also provide a set of AI-driven tools which are produced by the BBC i.e., in-house or in partnership with others.

The first example of a system relying on AI techniques such as transcription using natural language processing (NLP) to convert audio inputs into text is the BBC’s speech-to text engine, *Kaldi*. The same AI techniques are also used for an audio visualisation tool powered by Kaldi, called *Audiogram Generator*. Other AI techniques like machine translation, speech-to-text auto subtitling or text-to-speech and voice synthesis (synthetic speech) are employed in *ALTO* – a virtual voice-over tool for revisioning video content into multiple languages. BBC’s digital voice assistant is called *Beeb* and serves as a voice agent, functioning on the principles of NLP, natural language understanding (NLU), natural language generation (NLG), speech-to-text and text-to-speech. NLP and machine learning are also employed in designing a *climate bot*. Journalists working at the BBC also use the *Factorisation engine*, a news recommender system devised through content-based and collaborative filtering using machine learning.

⁴ <https://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/artificial-intelligence-committee/artificial-intelligence/written/70493.pdf%20>.

For media editing, repurposing and augmentation with the purpose of automated content production, *OCTO* represents a valuable AI-driven system employing automatic speech recognition and shot detection. Among journalistic uses, *In-app personalisation* is also valuable for segmenting audiences and curating content even if the AI technique behind it is unsupervised machine learning. News production is also helped by the *Discoverability scoring*, which helps practitioners to easily identify which audiences could find content based on graph-based machine learning. This AI technique also features in the *Subtopic Generation* system developed by the BBC to automatically create subtopics for major topics in online news content. According to Jones et al., this is only a small set of AI-driven tools used in news production at the BBC. Concurrently, there are other tools that reflect the way news production intersects with AI at the UK's largest public service broadcaster. It is worth mentioning that either particularly procured, licensed, subscription or free applications of AI pertain to this category. Thus, at an intermediate level, journalists might use "*Dataminr* for identifying leads, *Chartbeat* for running analytics, and *CrowdTangle* for monitoring competitors and trends". The conducted research confirms that the most common "platforms/services/systems/tools which have significant AI components" are the external ones, with "social media and open source intelligence tools" serving as clear examples (Jones, Jones & Luger, 1740).

5. Conclusions

With the advent of emerging technologies and the use of AI systems in various fields, the need for regulatory bodies to create AI-related policies has never been a more pressing issue. In a quest to ensure a responsible implementation of AI in the news media industry, the Council of Europe published in December 2023 new guidelines for the development of journalism in a professionally and financially sustainable way.

As the UK's largest public service broadcaster that serves public service journalism, the BBC has created a Research and Development department which also seeks to address the responsible incorporation of AI technologies into journalism, fostering insight particularly into machine learning systems and, thus, contributing to a wider understanding of how AI affects individuals and society more broadly. The BBC has invested resources not only in establishing the R&D department as a "centre of excellence", but also in creating an innovation-focused unit. Since 2012, BBC News Labs has played a key role for experimenting with the development and application of AI in news production. Although the BBC uses its own suite of AI-driven tools, a larger amount of platforms, services or systems for journalistic use(s) are not developed in-house.

In 2017, the BBC has also made a public commitment to playing an active role in ensuring a responsible implementation of AI tools in the newsroom in accordance with its values and principles and with the main purpose to serve the public interest. There are 19 projects currently conducted by the BBC R&D department that address the pressing issues regarding artificial intelligence and machine learning, the most recent one being initiated in 2023. One of the most significant goals of the researchers' work underlines the importance of analysing the impact of implementing emerging technologies, especially generative AI in news organisations and provides three main categories in relation to editorial, legal and societal risks.

References

- Bailer, W., Thallinger, G., Krawarik, V., Schell, K., Ertelthaler, V. (2022). AI for the Media Industry: Application Potential and Automation Levels. *MultiMedia Modeling. MMM*. Lecture Notes in Computer Science, 13141, 109-118. https://doi.org/10.1007/978-3-030-98358-1_9.
- Brennen, J.S., Howard, P.N., & Nielsen, R.K. (2018). "An industry-led debate: how UK media cover artificial intelligence". Reuters Institute for the Study of Journalism.
- Broussard, M., Diakopoulos, N., Guzman, A. L., Abebe, R., Dupagne, M., & Chuan, C. H. (2019). Artificial Intelligence and Journalism. *Journalism and Mass Communication Quarterly*, 96, 673–695.
- Council of Europe. CDMSI. (2023). "Guidelines on the responsible implementation of artificial intelligence systems in journalism", adopted by the Steering Committee on Media and Information Societies (CDMSI) on 30 November 2023.
- Diakopoulos, N. (2019). *Automating the News. How Algorithms are Rewriting the Media*. Cambridge, Massachusetts: Harvard University Press.
- Gelgel, Ni Made Ras A. (2020). Will Technology Take over Journalism? *Informasi*, 50, v-x.
- Havens, T. & Lotz, A. D. (2017). *Understanding Media Industries*, 2nd Edition, Oxford: Oxford University Press.

Jaakkola, M. (ed.) (2023). *Reporting on Artificial Intelligence: A Handbook for Journalism Educators*. UNESCO Series on Journalism Education. <https://doi.org/10.58338/HSMK8605>.

Jones, B., Jones, R. & Luger, E. (2022). AI “Everywhere and Nowhere”: Addressing the AI Intelligibility Problem in Public Service Journalism. *Digital Journalism*, 10 (10), 1731-1755, <https://doi.org/10.1080/21670811.2022.2145328>.

Jones, B., Jones, R. & Luger, E. (2023). Generative AI & journalism: A rapid risk-based review. *Edinburgh Research Explorer*, The University of Edinburgh, BBC R&D.

Jungherr, A. & Schroeder, R. (2023). Artificial Intelligence and the Public Arena. *Communication Theory*, 33 (2-3), 164-173. <https://doi.org/10.1093/ct/qtad006>

Larson, E. J. (2021). *The myth of artificial intelligence: Why computers can't think the way we do*. The Belknap Press of Harvard University.

de-Lima-Santos, M.-F. & Ceron W. (2022). Artificial Intelligence in News Media: Current Perceptions and Future Outlook. *Journalism and Media*, 3: 13-26. <https://doi.org/10.3390/journalmedia3010002>.

Mitchell, M. (2019). *Artificial intelligence: A guide for thinking humans*. Giroux.

Newman, N., Fletcher, R., Schulz, A., Andi, S., Robertson, C.T., & Nielsen, R.K. (2021). “Reuters Institute Digital News Report”. Reuters Institute for the Study of Journalism.

OECD, *Recommendation of the Council on Artificial Intelligence*, OECD/LEGAL/0449

Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach*, 4th edition. Pearson Education.

Smith, B. C. (2019). *The promise of artificial intelligence: Reckoning and judgment*. The MIT Press.

Toffler, A. (1970). *Future Shock*. New York: Random House.

Veglis, A. & Maniou, T. A. (2019). Chatbots on the Rise: A New Narrative in Journalism. *Studies in Media and Communication*, 7(1), 1-6, <https://doi.org/10.11114/smc.v7i1.3986>.

Webography

BBC Research & Development, “Our Purpose”, accessed January 17, 2024, <https://www.bbc.co.uk/rd/about/our-purpose>.

BBC – Written evidence (AIC0204), accessed January 18, 2024, <https://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/artificial-intelligence-committee/artificial-intelligence/written/70493.pdf%20>.

UNESCO, “Ethics on Artificial Intelligence”, accessed January 22, 2024, <https://www.unesco.org/en/artificial-intelligence/recommendation-ethics>.