ELWAHAT Journal for Research and Studies
Available online at :https://www.asjp.cerist.dz/en/PresentationRevue/2

ISSN : 1112-7163 E-ISSN: 2588-1892 Volume(17)/Issue (2) (2024):332-347

Implementing Artificial Intelligence in Media Production

A Field Research on a sample of local media outlets in Setif

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Received: 22-10-2024 Accepted: 27-11-2024 Published**:** 15-12-2024

Abstract:

This research paper aims to investigate the extent to which artificial intelligence is used in the journalistic production process within local media institutions, specifically in the city of Setif, Algeria. Given the widespread use of artificial intelligence in all economic and media sectors globally due to its facilitation and acceleration of performance, the application of artificial intelligence is generally subject to the extent to which the institutional environment, with all its cultural, social, and scientific components, can accept artificial intelligence performance. This descriptive survey study attempts to explore the extent of artificial intelligence use within journalistic institutions through: the artificial intelligence techniques employed in the editorial and journalistic production process and its reliance on improving technical processes within institutions and their management, the use of artificial intelligence in data analysis to provide audience-related insights and assist in making strategic decisions in local media institutions, and the extent to which the studied journalistic institutions rely on training employees on artificial intelligence techniques to keep pace with developments at the international and global levels. The study concludes that there are many challenges facing efforts to expand the scope of work with artificial intelligence, primarily due to the technological capabilities of institutions and their readiness to implement artificial intelligence. Additionally, the digital culture of the workforce is a significant obstacle to accepting the idea of delegation or replacement by programs and robots.

Keywords: Artificial Intelligence, Media Organizations,Journalistic Production

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1. Introduction

With the rapid advancement of artificial intelligence technologies, organizations of all types have increasingly adopted AI as an information system or business software. The diverse range of systems, applications, tools, and techniques offered by AI is aimed at developing administrative, production, and marketing processes within institutions. As a result, information gathering has become more efficient and objective, transforming data into a strategic resource that employees rely on to perform their specialized tasks. There is a growing need for systems that can cater to the immediate information needs of employees and enable them to interact with computers by inputting new variables, modifying problem-related assumptions, and generating multiple scenarios to evaluate different solutions and select the optimal one, without relying on analysts or information specialists. Media organizations, in particular, can greatly benefit from AI due to the nature of media production, which heavily relies on the accuracy and reliability of information and data.

The media industry, in general, is poised to be significantly disrupted by artificial intelligence. This impending transformation has prompted major media organizations worldwide, particularly in the wake of the COVID-19 pandemic, to accelerate their adoption of advanced technologies such as AI to ensure their survival in an era where technology is increasingly intertwined with and competing against human endeavors. (Hala & Djomoaa, 2023, p. 06)

This descriptive exploratory study aims to shed light on the nature of artificial intelligence adoption in local media organizations, specifically local news websites, radio stations, and newspapers (sample under investigation). This study seeks to understand the extent to which these organizations benefit from AI, given its pivotal role in transforming the media industry. AI offers a wide range of technologies that enhance efficiency and creativity. Through machine learning algorithms, vast amounts of data can be analyzed to identify trends and audience interests, facilitating more effective content personalization and marketing. Moreover, AI can generate textual and visual content, such as news articles and videos, accelerating the production process. Additionally, AI contributes to improving user experience by providing personalized content recommendations, machine translation, and sentiment analysis of social media comments. Consequently, AI represents

added value for media organizations as it can enhance content quality, increase reach, and foster audience engagement, Consequently, we can ask the following general question as:

Is artificial intelligence being integrated into the workflows of local media outlets, such as radio stations, newspapers, and news websites, to support media production and distribution?

Sub-questions: And this general question can be divided into sub-questions:

- How extensively are AI applications employed in the technical operations of local media outlets?
- Do local media organizations (radio, print, and online) leverage artificial intelligence for organizational management?
- Are journalists in local media employing AI-powered tools to streamline the editing and production of news content?

2. Overview of Artificial Intelligence (AI)

Artificial intelligence, or AI, is the term used to describe the emulation of human intelligence in machines designed to think and learn similarly to humans (Bostrom, 2014, p. 27)Artificial Intelligence is the capability of machines/robots to perform operations generally require human intelligence (speech recognition, decision-making, visual perception, and natural language comprehension).

In the 1980s, what became known as the diversification movement or Machine Learning began, where programming processes started to bridge the gap between knowledge acquisition and extraction and the implementation of this knowledge in machines, or the acquisition of machine vision or motion capabilities. The resurgence of artificial intelligence was partly due to the success of expert systems designed to replicate the expertise of highly knowledgeable individuals, followed by attempts to encode their knowledge into a form that AI software could utilize. This was done using various methods, including decision trees. (Sternberg & barry, 2017, p. 07), It also provides a simple definition Renowned AI researcher Kurzweil defines artificial intelligence as the craft of designing and developing systems that can mimic human cognitive functions such as learning, reasoning, and problem-solving (Al-Fadli, 2018, p. 147)

As the introducer of the term AI, McCarthy defined it as the science and engineering of making intelligent machines, especially intelligent computer

programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable. From this perspective, intelligence relates to the human ability to effectively perceive and process data, as well as transform it into knowledge, which is later used for goal-driven behavior. McCarthy's approach, and Sutton proposed a more complex definition: Intelligence is the computational part of the ability to achieve goals. A goal achieving system is one that is more usefully understood in terms of outcomes than in terms of mechanisms." In this case, intelligence means the ability to solve hard problems, and AI would be considered as the field of research concerned with marking machines does things that people consider to require intelligence (Thaichon & Quash, 2023, p. 06), A growing number of researchers suggest that artificial intelligence is developing human-like cognitive abilities (Thaichon & Quash, 2023, p. 07)

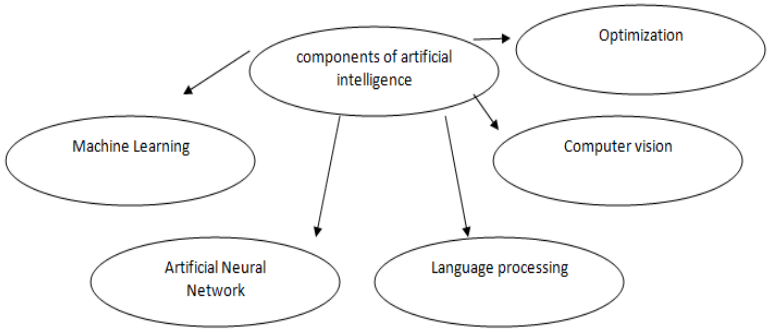
Artificial Intelligence (AI) is a broad branch of computer science aimed at developing systems capable of mimicking human cognitive functions such as learning, reasoning, decision-making, and problem-solving. In simpler terms, it involves creating machines that can think and act intelligently.

2.1. The Technical aspect of Artificial Intelligence

Today, Artificial Intelligence is considered a branch of engineering that implements novel concepts and novel solutions to resolve complex challenges. With continued progress in electronic speed, capacity, and software programming, computers might someday be as intelligent as humans. One cannot neglect the important contribution of contemporary cybernetics to the development of AI. (Hamet & Tremblay, 2017) (Hamet & Tremblay, 2017, p. 02)

Based on the definitions provided within the specialties, the structure of artificial intelligence can be presented according to the following model:

Form Number 01: Components of Artificial Intelligence - Prepared by Researchers



Artificial intelligence draws upon multiple scientific fields, including technology, mathematics, and even psychology, in an attempt to simulate the human mind, Therefore, the technical requirements for artificial intelligence may include the following:

- **Logic-Mathematical intelligence:** Early AI advancements focused on equipping machines with the capacity to solve intricate analytical tasks that demanded logical reasoning. This capability empowered machines to make independent decisions grounded in collected data and adjust their actions accordingly. Essentially, it mirrored human intelligence by enabling machines to analyze problems and situations logically, leading to appropriate .
- **solutions Social intelligence**: Scholars highlighted how AI can have social, empathetic intelligence that spans several contexts, including service , domestic, hospitality. (Pantano & Scarpi, 2022, p. 584) (Pantano & Scarpi, 2022, p. 584), you can summarize it in the following table:

Table(01) :**Highlights the differences in the concept and components of artificial intelligence across various disciplines.**

AI Intelligences	Description	scientific sources	Proposed scale
Mechanical or Operational	The ability to learn and perform basic and repetitive tasks Gr	Grewal et al. (2020); Huang and Rust (2018 2021b); Dong et al. (2020)	Included (part of Processing-Speed intelligence)
Thinking	The ability to perform analytical and intuitive tasks (it is reasoning-based)	Grewal et al. (2020); Huang and Rust (2018 2021b)	Included (part of LogicMathematical intelligence)
Emotional or Feeling or Affective	The ability to recognize human emotions and adapt the behavior accordingly	Grewal et al. (2020); Huang and Rust (2018 2021b); Montes and Goertzel (2019)	Included (part of Social intelligence)
Self-Organizing Cooperation	The ability to coordinate with other AI to create a selfmanaged, autonomous, collaborative network (distributed intelligence)	Montes and Goertzel (2019)	Not included
Social Cognition	The ability to process, store and apply information about others and behave accordingly	Van Doorn et al. (2017); Caic et al. (2019); Martinez-Miranda and Aldea (2005)	Included (part of social intelligence)
Instance processing	Ability to select, classify and shorten large-scale instances (risks, images, any other entity	Cheng, Chu, and Zhang (2021); Muhlhoff 2020	Included (part of Logic Mathematical)

Source: Measuring Artificial Intelligence Types and their Effect on Consumers Emotions in Service. (Pantano & Scarpi, 2022, p. 586)

2.2 Levels of Artificial Intelligence

Levels of Artificial Intelligence are usually classified into three main levels: There are three levels of artificial intelligence: ANI, AGI and ASI.

- **ANI** (Artificial Narrow Intelligence) – is the first level that can make a decade only in one sphere. For example, there's AI that can beat the world chess champion in chess, but that's the only thing it does.
- **AGI** (Artificial General Intelligence) – AI that reaches and then passes the intelligence level of a human, meaning it has the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, and learn from experience.
- **ASI** (Artificial Super Intelligence) – an intellect that is much smarter than the best human brain in practically every field, including scientific creativity, general wisdom and social skills. (fredson, 1997, p. 13)

3. The reality of employing artificial intelligence (AI) in institutions in the world varies

3.1 Statistical indicators regarding the deployment of artificial intelligence in the international economic sector.

China advances in Artificial Intelligence adoption, with 58% of companies deploying AI. In comparison, the United States has a lower implementation rate, with 25% of companies using AI and 43% exploring its potential applications (Forbes, 2023). Artificial Intelligence is projected to have a substantial economic impact, contributing a net increase of 21% to the United States' GDP by 2030.

Artificial Intelligence can automate routine tasks, allowing employees to focus on more creative and strategic work. Make better decisions by providing accurate and timely data analysis due to AI-driven technologies that spur development and innovation across almost all sectors. Some industries stand to gain significantly from AI developments, including healthcare, automotive, manufacturing, and financial sectors. It is estimated that AI might cause the elimination of 85 million jobs by 2025 (Advisor, 2023)

In recent years, with the expanding availability of consumer information and information coming from multiple devices connected to the internet (IoT), companies have started to improve their maturity in terms of data science skills and business analytics. According to Gartner, business analytics maturity can be measured in 4 stages, from a (1) more descriptive use of information, to (2) a diagnostic analysis stage that implies an understanding of the root causes that led to a specific result. (Maria, Loureiro, Guerreiro b, & Tussyadiah, 2021, p. 915)

However, there are studies that offer limited rates of employing artificial intelligence. For example, a study of Abdullah Mohammed Atbiqa confirms that: A percentage of 7.3% of the sample individuals perceive that the institutions they work for do not rely on artificial intelligence technologies. This could be attributed to the high cost of implementing these technologies and the difficulty of transitioning from traditional methods that the institution relies on in its operations. Additionally, the lack of specialized skills in this field may also contribute to this perception. (Mohammed & Al-Sun, 2023, p. 207)

3. 2. Algeria's experience in founding local media outlets:

Numerous communication studies conducted in developing and newly independent nations have underscored the pivotal role of media in fostering social development, providing public services, and implementing integrative national policies aimed at uplifting societies that have endured the ravages of colonialism and various forms of political, economic, and cultural backwardness. Herbert Schiller's work, which gave rise to the development communication theory, has particularly emphasized this point, asserting that media in newly independent nations have adopted public communication policies primarily focused on achieving national gains rooted in preserving the individual, values, stability, and the nation. Algeria's media, post-independence, is a testament to this approach (saber, 2019, p. 115)

In its initial stages post-independence, the media sector in Algeria modeled its journalistic practices on the public print media and the television and radio sectors, which were remnants of French colonization and were subsequently nationalized on 28 October 1962. Afterward, it embarked on a journey to serve the people and the regime by supporting developmental and political endeavors through the utilization of media tools.

3.3 The evolution of Algeria's public and private audiovisual and written media: A historical and legislative analysis.

The audiovisual field embodies all media and communication means that rely on audio-visual images, i.e., materials that present information in an audible and visual manner. Audiovisual activity refers to anything made available to the public or a segment thereof through wireless communication, or the broadcasting of signals, signs, drawn forms, images, sounds, or various messages that do not have the character of private correspondence.

(Teniou, 2020, p. 154), The public television institution in Algeria has undergone a digital transformation, integrating digital broadcasting systems, news centers, and studios. By adopting electronic editing and archiving systems, the organization has significantly enhanced its operational efficiency and content quality . (Lamia, 2022, p. 05)

Speaking of opening up the audiovisual sector in Algeria, it is considered a challenge and a bet that newspapers are raising. According to this bet, the field is considered a protected and sensitive area in the context of the development undertaken by the state based on the reforms initiated by the President of the Republic in April 2011. In which the audiovisual media sector was included, considering that the law determines the rules of work in this field and authorized the opening of satellite and radio channels to those who wish to keep pace with the sector within an organized and systematic framework, as stipulated in Article 63 of Law 12/05, which states: 'The establishment of any thematic audiovisual communication service and distribution via radio broadcasting or television, as well as radio frequencies, is subject to a license granted by decree. An agreement must be concluded between the audiovisual regulatory authority and the licensee. This use constitutes a special occupation of the public property of the state." As it is clear in the law on audiovisual activities 14/04 in its seventeenth article, which states: "Any licensed audiovisual communication service is considered a thematic television or radio broadcasting service established by decree in accordance with the conditions stipulated in the provisions of this law (Al-Nadhri & tabib, 2016, p. 14)

4. Research methodology & techniques

The current phase of media transformations and its tools has caused a significant upheaval in media research, as John Hartley aptly put it "..media studies itself has changed dramatically as a result of the digitalization of media. And despite a range of Newtheoretical concerns arising from the advent of digital media, media studies has become increasingly procedural rather than descriptive. (Hartley, 2011, p. 165)

This study belongs to the descriptive survey studies, where the field survey method was adopted for the research sample, which consisted mainly of journalists, employees, and technicians of the media institutions under study:

Setif Local Radio, Al-Haddaf Newspaper office, and Al- Khabar newspaper, a purposive sample was drawn given that the total number of employees in the three media institutions was not fully available, The sample size is estimated to be 21 participants.

As for the data collection tools, we relied primarily on the questionnaire as a data collection instrument,the questionnaire is defined as a method of collecting data that targets respondents in a systematic and meticulous manner to provide facts, opinions, and specific ideas within the framework of data related to the study's topic and objectives, without the researcher interfering in the respondents' self-presentation of this data (Abdelhamid, 1993, p. 183), the survey was distributed to the three media outlets between April 14th and 23rd, 2024. the questionnaire includes the following procedural sections:

- To what extent are AI applications utilized in the technical operations of local media organizations.
- To what degree do local media organizations (radio, print, and online) employ artificial intelligence for organizational management
- To what extent do journalists in local media use AI tools in the editing and production of news content.

5. Results and discussion :

The survey instrument comprised 23 in-depth questions, categorized into three primary themes as outlined earlier. Solely the pertinent statistical tables will be exhibited, allowing for an analysis of the interrelationships among the study variables.

Table (02) The table illustrates the extent to which the journalist utilizes AI applications in their work

Statements	Frequency	Percentage	Valid percentage	Cumulative percentage
Always	1	4.8	4.8	4.8
Sometimes	15	71.4	71.4	76.2

Occasionally	5	23.8	23.8	100
Total	21	100	100	-
The source : The data was analyzed using SPSS software				

According to the table, artificial intelligence is being increasingly adopted by Algerian public institutions, especially in the media sector, where 71.4% of respondents reported using AI ,this evidence supports the idea that Artificial intelligence is revolutionizing the field of journalism, offering new tools and capabilities that can enhance efficiency, accuracy, and reach. Here are some key areas where AI is making a significant impact as: Automation of Routine Tasks, Enhanced Data Analysis, Improved Content Creation. However, 23.8% reported using it on a case-by-case basis ,This confirms that Journalism and media, in general, are characterized by a sense of urgency and suddenness, as their work is largely driven by daily events at the local, national, or international level. Therefore, relying on a rapid information source such as artificial intelligence is both necessary and practical.

Table (03) The table outlines the AI technologies implemented by the study participant in their journalistic work

AI Application	**Frequency**	**Percentage**	**Valid percentage**	**Cumulative percentage**
AI-Press editing tools	7	33.3	33.3	33.3
General- models: Gemini-chgpt	11	52.4	52.4	85.7
Content creation tools	3	14.3	14.3	100
Total	21	100	100	-
The source : The data was analyzed using SPSS software				

As evidenced by Table (03), the percentages indicate that artificial intelligence enables various technologies that significantly facilitate and enhance journalistic work, General-purpose AI tools such as Gemini and ChatGPT have garnered significant attention from respondents, accounting for 52.4% of all selected AI tools for journalistic work. This preference is primarily attributed to their user-friendly nature, immediate availability, and effortless usability.

Table (04) The table illustrates the functions that AI fulfills for journalists during the process of crafting news articles or reports.

AI fonctions	**Frequency**	**Percentage**	**Valid percentage**	**Cumulative percentage**
Providing information you don't know	9	16.9	33.3	33.3
helps to formulate news stories accurately	10	18.8	52.4	85.7
offers you opportunities to propose new journalistic topics	11	20.7	23.7	23.7
assists you in obtaining historical data	13	24.5	14.3	100
Total	53	100	100	-

The source : The data was analyzed using SPSS software

According to the statistical data in table(04), all individuals in the sample utilize artificial intelligence in their work, The survey results indicate a growing reliance on AI tools within the journalism industry. For instance, the data shows that 24.5% of respondents utilize AI tools for historical event recovery and documentation, while 20.7% leverage AI software to generate topic proposals for journalists. This highlights the significant impact of AI on various aspects of journalistic work, and 16.9% of respondents utilize AI for Providing information that them don't know .

With the tremendous advancements in AI technologies, the idea of a robot journalist has emerged as a significant topic in the global media sector, particularly as a means to cut labor costs.

Artificial intelligence serves as a powerful tool for journalists, enabling them to improve their work and create high-quality content. Nevertheless, journalists must stay at the heart of the creative process, employing AI as a supportive tool rather than a substitute for their abilities and experience On the other hand, 33.3% of respondents confirmed that they utilize specialized AI tools for both journalistic and broader media production. This is attributed to the recent proliferation of AI tools across various sectors, including economic, financial, and educational institutions, and now extending to the media industry. The table above provides a breakdown of the various AI tools employed in data analysis and content creation, the robot journalist report issued by the SAMT Center for Studies has strongly suggested that the possibility of a replacement journalist is now a serious consideration (Center, 2018)

Table (05) The table presents the most commonly used AI tools in the journalistic production process.

Frequency			
Sugesstions	**Reply**		**observations**
	N	**Percentage**	**Percentage**
Midjourney	11	26.8%	52.4%
Google Bard	10	24.4%	47.6%
Gemini	6	14.6%	28.6%
Chat Gpt	10	24.4%	47.6%
Microsoft bing	4	9.8%	19.0%
Total	41	100.0%	195.2%

Table 5 above presents varying percentages of specialized AI software types used in journalistic output, media data analysis, and news writing**,** This can be further detailed as follows "26.8% of journalists' responses are based on information obtained using Midjourney,Midjourney is an AI program that

creates images from text descriptions. Think of it as having your own personal artist who can draw anything you imagine.

However, 24.4% confirm that they are using Google Bard,it is a large language model developed by Google AI. It's designed to provide informative and comprehensive responses to a wide range of prompts and questions. Think of it as a virtual assistant that can help you with tasks like:Providing summaries of factual topics- Creating stories - Translating languages.

Writing different kinds of creative text formats,than 24.4 % utilize Chat Gpt for editing the press work, "These tools are constantly evolving and updated almost monthly, leaving employees often as mere users rather than specialists in their field due to the high level of professionalism of many AI tools.

While 14% of the respondents confirmed that they use the Gemini program, it is a large language model developed by Google that is capable of generating human-quality text. It can also translate languages, summarize information, and answer your questions, Given its advanced language capabilities, this program is highly suitable for journalistic work. It allows for the browsing of international news and press reports in various languages and provides professional support for translation and editorial work. Therefore, it seems logical to rely on such tools in the media industry, which is typically characterized by speed, accuracy, and time constraints.

Table (06) : The table presents the survey results regarding the possibility of artificial intelligence substituting journalists in media outlets.

Statements	**Frequency**	**Percentage**	**Valid percentage**	**Cumulative percentage**
yes	13	61.9	61.9	61.9
No	8	38.1	38.1	100
Total	21	100	100	-

The source : The data was analyzed using SPSS software

The survey results show that:

61.9% of respondents believe that AI could eventually replace journalists in media outlets. This means that a significant majority of participants think

that AI has the potential to take over the roles currently performed by human journalists.

38.1% of respondents do not believe that AI can replace journalists. This indicates that a considerable portion of the participants are skeptical about AI's ability to fully replace human journalists and believe that human skills and judgment will remain essential in the field of journalism.

Overall, the results suggest a divided opinion on the potential of AI to replace journalists. While a majority of respondents believe that AI could eventually take over these roles, a significant minority still believes that human journalists will remain indispensable.

Risks of artificial intelligence replacing employees within organizations: Specific risks to highlight:

- Dependence on technology: Overreliance on AI could make societies vulnerable to technological failures or cyberattacks.
- Job loss: AI could lead to widespread unemployment as machines become capable of performing tasks traditionally done by humans
- Economic inequality: The benefits of AI may not be distributed evenly, leading to increased wealth inequality.
- Social unrest: High unemployment rates caused by AI could lead to social unrest and political instability.
- Ethical concerns: The development and use of AI raise ethical questions about issues such as privacy, bias, and accountability.

6. Conclusion:

This study has examined the implementation of artificial intelligence in media production within a sample of local media outlets in Setif. The findings suggest that while there is a growing awareness of AI's potential, its adoption is still in its early stages. Key challenges identified include the lack of technical expertise, financial constraints, and concerns about job displacement. Nevertheless, the study highlights the significant potential of AI to revolutionize the media industry, from automating routine tasks to enabling more personalized content creation. Future research should explore in more depth the factors influencing the adoption of AI in different media contexts, as well as the ethical implications of its use.

Artificial intelligence is a powerful tool that journalists can leverage to enhance their work and produce high-quality content. However, journalists must remain at the heart of the creative process and use AI as an aid, not a replacement for their skills and experience.

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