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The Use of Artificial Intelligence Technologies in Digital Investigative Journalism: An Analytical Study of a Sample of Investigations from the ARIJ Platform

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ABSTRACT

This study examines the use of artificial intelligence technologies in digital investigative journalism through an analytical study of a sample of investigations published on the ARIJ platform. The study aims to identify the main issues addressed and the objectives underlying the integration of artificial intelligence technologies into digital investigative investigations. It also seeks to determine the treatment approaches adopted in the investigative reports under study, assess the level of language and the technical formats employed in the digital investigative investigations constituting the research sample, and ultimately identify the visual elements and artificial intelligence tools utilized in digital investigative investigations on the ARIJ platform, which represents the field of the study.

The study relied on a purposive sample comprising four investigations published on the ARIJ digital platform, employing the content analysis approach and its associated analytical tool. The study revealed several findings, including that the examined digital investigative investigations are characterized by a critical approach to various issues, diversity in objectives, sources, and technical formats, as well as ARIJ's orientation toward incorporating artificial intelligence technologies in data collection, analysis, and visualization processes.

Keywords: treatment; artificial intelligence technologies; digital investigative journalism; ARIJ platform.

1. INTRODUCTION

The digital revolution has brought about fundamental transformations in journalistic practices, particularly in investigative journalism, which has evolved from dependence on traditional sources toward the adoption of advanced digital technologies, most notably data journalism and open-source intelligence (OSINT). With the rapid advancement of artificial intelligence, journalistic institutions have gained access to tools capable of processing vast amounts of data, analyzing documents, identifying concealed patterns and relationships, verifying images and videos, and contributing to the production of visual and textual content.

However, this transformation has generated numerous scientific and professional concerns. While artificial intelligence is regarded as a means of improving the efficiency of investigative journalism and accelerating its production processes, questions have arisen regarding the extent of dependence on these technologies, their impact on the quality of journalistic investigations, the reliability of their results, journalists' autonomy, and compliance with ethical principles such as transparency, accountability, and source protection.

The ARIJ platform is considered one of the most prominent Arab institutions that has adopted data journalism and open-source intelligence in the production of investigative reports. This makes it an appropriate field for examining the nature of artificial intelligence technologies' integration within these investigations, their functions, and their influence on the construction of journalistic investigations in terms of both structure and content.

Artificial intelligence has introduced a significant transformation in the media work environment. Its role is no longer confined to the execution of specific technical tasks; rather, it has become an active element across various stages of journalistic content production, particularly in digital investigative investigations that depend on the collection of extensive datasets, document analysis, source tracking, information verification, and the construction of journalistic narratives. This development has provided journalists with new capabilities, including accelerating research procedures, identifying hidden patterns within data, and producing more accurate and interactive content.

Despite these advantages, the use of artificial intelligence in investigative journalism raises several questions concerning the boundaries of machine reliance in producing journalistic knowledge, the extent to which these technologies affect the quality and credibility of investigations, and their contribution to preserving professional and ethical standards such as accuracy, transparency, source protection, and editorial responsibility.

Considering the increasing reliance of media institutions on artificial intelligence applications, there is a growing need to investigate how these technologies are utilized in journalistic investigations, identify their functions, and determine their impact on the construction of investigations and their different stages. This can be achieved through the analysis of practical models, such as the ARIJ digital platform. Accordingly, the following

main research question can be formulated: **How are artificial intelligence technologies employed in digital investigative journalism?**

The following sub-questions emerge from this main question:

In terms of content:

- What are the main topics addressed by the investigations?
- What are the objectives of employing artificial intelligence technologies within the investigations?
- What treatment approaches are adopted in the digital investigative investigations constituting the field of study?

In terms of form:

- What journalistic formats are used in presenting investigative investigations?
- What is the nature of the language employed in the digital investigative investigations constituting the study sample?
- What forms of multimedia are used in the investigations (images, videos, infographics, interactive maps, charts, documents...)?
- What artificial intelligence tools are employed in the investigative investigations constituting the study sample?

2. Study Objectives:

- Identifying the main issues addressed and the objectives underlying the use of artificial intelligence technologies in digital investigative investigations.
- Identifying the treatment approaches adopted in the investigative investigations constituting the field of study.
- Determining the level of language and the technical formats employed in the digital investigative investigations forming the study sample.
- Revealing the visual elements and artificial intelligence tools utilized in digital investigative investigations on the ARIJ platform, which represents the field of study.

3. Study Concepts:

To examine this research problem concerning the relationship between artificial intelligence technologies and their application in digital investigative investigations through the ARIJ platform, the following concepts and elements are addressed:

- **Concept of digital media:**

The concept of digital media, which emerged from the integration of modern technologies with the Internet environment, refers to various means capable of providing information and news about current events to broad segments of the public, with the objective of influencing their perceptions and achieving purposes related to entertainment and education. (Shafik, 2011, p. 53)

- **Concept of artificial intelligence**:

It refers to specific behaviors and characteristics demonstrated by computer programs that

enable them to simulate human cognitive abilities and patterns of functioning. Among the most significant characteristics are the ability to make decisions, draw conclusions, and respond to situations that have not been explicitly pre-programmed into the machine. (Rahman, 2018, p. 5)

Artificial intelligence also refers to systems capable of exhibiting intelligent behavior through the analysis of their environment and the implementation of actions with a certain degree of autonomy in order to achieve specific objectives (Boucher, 2020, p. 4)

- **Concept of investigative journalism**:

It refers to journalistic investigations and reports based on methods and procedures established according to scientific and professional standards, which journalists employ to uncover verified facts by examining complex issues and revealing the ambiguities surrounding them. Its purpose is to provide oversight of public authorities and safeguard the interests of society. (Ayadi, 2024, p. 5)

4. Theoretical Foundations:

4.1 Levels of artificial intelligence: There are three fundamental levels of artificial intelligence, as follows: (Boubaha, 2022, p. 95)

4.2 Super artificial intelligence: Artificial intelligence reaches a stage at which the intellectual capabilities of machines surpass human abilities in performing specific tasks.

4.3 Strong artificial intelligence: It refers to the development of artificial intelligence to a level where the intellectual capabilities of machines become functionally comparable to those of humans, through p

rogramming computers to possess a human-like intelligent mind characterized by perception and beliefs. Its features include the ability to think and interact intelligently, make judgments, plan, learn, and perform other cognitive functions.

4.4 Weak artificial intelligence: It consists of limited artificial intelligence systems that possess specialized intelligence and simulate intelligent behavior within a specific field. An example is Apple's intelligent personal assistant Siri, which relies on Internet-based applications as an extensive database to answer users' spoken inquiries and engage in conversations with individuals; however, it functions within a restricted and predetermined framework.

4.5 Digital Investigative Journalism and Artificial Intelligence Tools: Investigative journalism has undergone a significant transformation with its transition into the digital environment. The process of collecting and verifying information is no longer limited to interviews and traditional documents; instead, it has increasingly benefited from digital databases, open-source resources, data analysis tools, and computational technologies. This transformation has contributed to the emergence of new investigative practices that integrate the professional principles of journalistic investigation with the capabilities offered by digital technologies.

Digital investigative investigations are also distinguished by their capacity to manage large

volumes of data and documents, as digital tools allow journalists to organize and analyze information, as well as identify relationships and patterns that may be challenging to detect through traditional manual approaches. This contributes to enhancing journalists' ability to formulate investigative hypotheses based on evidence and data. (Hahn & Florian , 2018)

Regarding artificial intelligence, it has become an increasingly significant component of the tools employed in investigative journalism, particularly in managing extensive datasets, analyzing documents, identifying patterns, and extracting information that may generate new investigative stories or hypotheses. The relevance of these technologies is particularly apparent when the volume of available data exceeds journalists' ability to process it manually. (Kunert, 2025)

Natural language processing techniques can also be employed to analyze extensive collections of documents by extracting names of individuals, organizations, locations, and keywords, classifying documents, and identifying information relevant to the investigation. These technologies provide journalists with the ability to reduce the time required for data processing while maintaining the essential need to subject results to independent journalistic verification. (Stray, 2021)

The application of artificial intelligence in investigative journalism does not indicate the replacement of journalists; rather, it constitutes a tool for strengthening their research and analytical capabilities. Algorithms are capable of processing data and identifying patterns; however, journalists remain responsible for interpreting results, verifying their accuracy, assessing their journalistic relevance, and contextualizing them within their social, political, and legal frameworks. (Jaakkola, 2023)

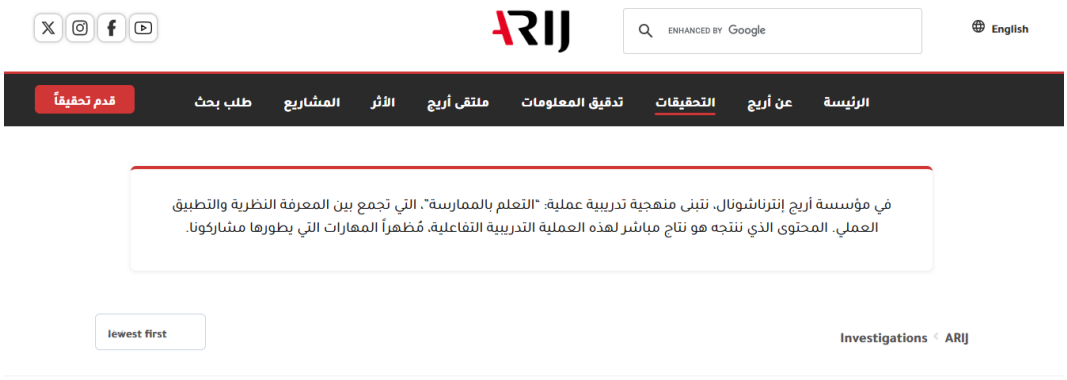
5. Applied Framework:

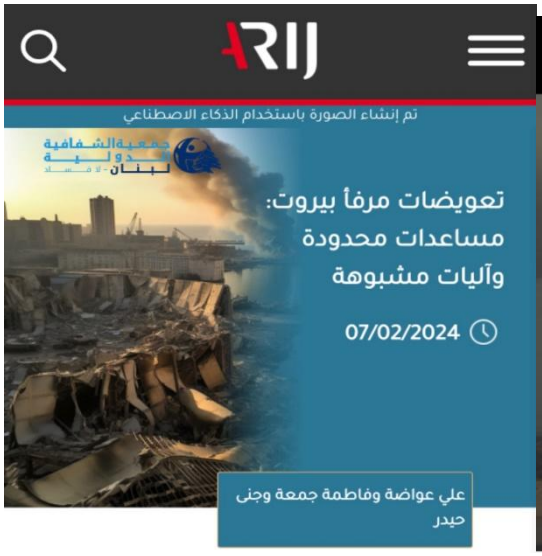
5.1 Profile of the ARIJ Platform: Arij

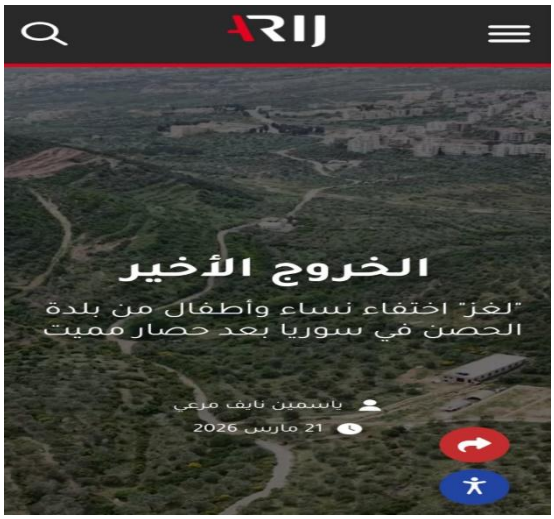
It is the institution *Arab Reporters for Investigative Journalism*, which aims to promote investigative journalism practices and fact-checking in the Arab world by strengthening the principles of individual and institutional accountability within political, social, and legal contexts. In terms of innovation, the institution operates through the adaptation of useful tools for journalistic practices, the development of new tools, and the integration of artificial intelligence into Arab journalism since 2021 through the formulation of its own Arabic-language artificial intelligence strategies in 2022. These efforts are intended not only to support the continuous development of investigative journalism and fact-checking but also to contribute to strengthening the capacities of Arab media institutions in achieving a shared journalistic identity. (Ethics Principles Guide for the Use of Artificial Intelligence, March 2025). (Moussa & Ahmed Habib, 2019, p. 28)

5.2 Research Population and Study Sample:

This study falls within the category of descriptive studies that rely on quantitative and qualitative data related to the phenomenon under investigation, in addition to analyzing and interpreting the findings. Concerning the study sample, a purposive sampling method was adopted to select digital investigative journalism videos published on the ARIJ platform. The sample consisted of four videos selected according to the criterion of their use of artificial intelligence tools, as illustrated in the following images representing the study units:







Source : ARIJ Platform https://arij.net

5.3 Data Collection Tools:

The study data were collected through a content analysis form, which is considered one of the research methods used to examine the nature of media messages, gather information, and obtain findings that correspond to the objectives of the study.

- Content Categories of Digital Investigative Journalism Videos on the ARIJ Platform:

Table No. 01: Main Issues Addressed in Digital Investigative Investigations

Category of Issues Addressed	Frequency	Percentage
Human rights and freedoms issues	02	50%
Environment and health	01	25%
Technology as the direct topic	00	00%
Solidarity and aid issues	01	25%
Total	04	100%

Source: Prepared by the researcher based on the ARIJ platform.

The above table indicates that human rights and freedoms issues ranked first, accounting for 50%, representing two investigations out of the four analyzed cases. This reflects the significance of the human rights dimension as one of the fundamental orientations of investigative work on the ARIJ platform. This prominence can be attributed to the close relationship between investigative journalism and the principle of revealing violations and ensuring accountability for responsible actors. ARIJ highlights in its guiding principles its commitment to human rights and relevant international standards while considering investigative journalism as a practice founded on accountability and the service of public

interest. This orientation is evident in several investigations published on the platform, including the investigation entitled "Companies Violating the Rights of Cleaning Workers in Gaza Hospitals," which examined working conditions and violations affecting workers' rights in healthcare facilities.

Environmental and health issues ranked second, representing 25%, equivalent to one investigation out of four. This finding reflects the sample's focus on issues that have a direct impact on individuals and society, particularly since environmental and health investigations often depend on integrating field data, documents, statistical information, and scientific evidence. Such issues correspond with the characteristics of digital investigative journalism, which facilitates the use of data, open sources, and multimedia tools to establish and verify facts. The ARIJ platform provides several examples of investigations addressing these topics, including reports related to healthcare services and pollution. It also emphasizes, within its contemporary investigative methodology, the importance of utilizing open sources, processing large datasets, and applying digital tools in investigative practices.

Regarding solidarity and aid issues, they also represented 25%, corresponding to one investigation out of four. This indicates the sample's attention to social and humanitarian issues related to the effectiveness of aid distribution, the accessibility of assistance for beneficiaries, and the extent to which distribution mechanisms are governed by transparency and accountability. This dimension is clearly reflected in the ARIJ investigation entitled "Beirut Port Compensation: Limited Aid and Suspicious Mechanisms," which examined compensation procedures and financial assistance provided to affected institutions, relying on data, figures, documents, and communication with relevant stakeholders.

Table No. 02: Represents the Direction of Treatment in Digital Investigative Investigations

Category of Investigation Direction	Frequency	Percentage
Critical	03	75%
Human rights / humanitarian	01	25%
Neutral	00	00%
Positive	00	00%
Total	04	100%

Source: Prepared by the researcher based on the ARIJ platform**.**

The table illustrating the direction of treatment in investigative investigations shows that the critical direction ranked first, with a frequency of 03 and a percentage of 75%, while the human rights/humanitarian direction recorded a frequency of 01 and a percentage of 25%. In contrast, neither the neutral nor the positive direction appeared within the analyzed sample.

This variation in percentages can be explained by the fact that the investigated cases primarily adopt a critical and revealing approach toward problems and shortcomings, which corresponds with the nature of investigative journalism, based on uncovering facts of public interest and promoting accountability. The critical direction does not indicate a professionally negative orientation of the investigations; rather, it reflects a treatment approach centered on examining problems, deficiencies, or violations instead of simply providing a neutral descriptive presentation.

This finding aligns with the orientation of the ARIJ platform, which associates investigative journalism with accountability and the exposure of issues that various actors may attempt to conceal. ARIJ also emphasizes that one of its main objectives is to strengthen individual and institutional accountability.

Table No. 03: Represents the Objectives of Digital Investigative Investigations

Category of Objectives	**Frequency**	**Percentage**
Revealing a problem or violation	04	20%
Documenting facts and evidence	04	20%
Holding responsible parties accountable	03	15%
Public awareness	04	20%
Defending the rights of affected individuals	03	15%
Proposing solutions	02	10%
Total	20	100%

Source: Prepared by the researcher based on the ARIJ platform.

The table illustrating the objectives of investigative investigations reveals the diversity of functions performed by the investigations under study. The objectives of identifying a problem/violation, documenting facts and evidence, and raising public awareness ranked first, each recording a frequency of 04 and a percentage of 20%. This was followed by the objective of supporting responsible authorities, with a frequency of 03 and a percentage of 15%, as well as defending the rights of affected individuals, which also recorded a frequency of 03 and a percentage of 15%. Meanwhile, proposing solutions ranked last, with a frequency of 02 and a percentage of 10%.

These percentages indicate that investigative journalism within the sample is not restricted to exposing problems; rather, it integrates disclosure, documentation, awareness-raising, and accountability. The high frequency associated with documenting facts and evidence is particularly important, as the value of investigative work is not achieved solely through

presenting claims, but through establishing evidence and linking it to sources, documents, and testimonies.

In this context, the supportive role of artificial intelligence technologies becomes apparent. ARIJ indicates that artificial intelligence can contribute to data collection, analysis, and fact-checking processes, enabling journalists to devote greater attention to analysis and in-depth investigation.

- Categories of Form in Digital Investigative Journalism Videos on the ARIJ Platform:

Table No. 04: Shows the Technical Formats Adopted in Digital Investigative Investigations

Category of Technical Formats	Frequency	Percentage
Digital investigative investigation	04	24%
In-depth report	01	06%
Narrative storytelling format	04	24%
Interviews and testimonies	04	24%
Presentation of documents and evidence	04	24%
Total	17	100%

Source: Prepared by the researcher based on the ARIJ platform.

The table presenting the technical formats employed in digital investigative investigations demonstrates a strong reliance on investigative structures, interviews and testimonies, as well as the presentation of documents and evidence. Each of these categories recorded a frequency of 04, whereas the journalistic report format recorded a frequency of 01.

This finding highlights the sample's dependence on constructing investigations through diverse sources of evidence rather than relying solely on journalistic narration. Documents provide factual support, interviews offer testimonies and interpretations, while the investigative framework integrates these elements into a coherent and structured narrative.

ARIJ emphasizes, within its methodology, the importance of sources, documents, and testimonies in investigative investigations. Its fact-checking methodology also highlights the necessity of verifying materials and sources before publication. Accordingly, artificial intelligence does not replace these formats; rather, it contributes to supporting specific stages of their production, such as interview transcription, data analysis, research processes, and the creation of certain visual elements. These applications are explicitly addressed by ARIJ in its artificial intelligence guide.

Table No. 05: Represents the Language Used in Digital Investigative Investigations

Category of Language Used	Frequency	Percentage
Modern Standard Arabic	04	44%
Colloquial Arabic	03	33%
French language	02	22%
Total	09	100%

Source: Prepared by the researcher based on the ARIJ platform.

The language analysis table indicates that Modern Standard Arabic ranked first, with a frequency of 04 and a percentage of 44%, followed by colloquial Arabic, with a frequency of 03 and a percentage of 33%, while French ranked third, with a frequency of 02 and a percentage of 22%.

These percentages reflect the predominance of Arabic as the primary language of journalistic production within the sample, with a notable presence of colloquial language. This can be attributed to the nature of testimonies and interviews, which often preserve the original language of speakers in order to enhance authenticity and provide greater realism to the narrative. The presence of French reflects the use of sources, documents, or statements associated with Francophone contexts.

This finding also holds particular relevance in relation to artificial intelligence technologies, as ARIJ has developed a dedicated artificial intelligence strategy in Arabic. The platform also employs artificial intelligence tools for translation, linguistic proofreading, and rewriting, creating opportunities for integrating technology within a multilingual journalistic environment.

Table No. 06: Represents the Visual Elements in Digital Investigative Investigations

Category of Visual Elements	Frequency	Percentage
Photographic images	04	21%
AI-generated images	04	21%
Original documents	03	16%
Maps and charts	04	21%
Videos	02	11%
Infographics	02	11%
Total	19	100%

Source: Prepared by the researcher based on the ARIJ platform.

This table is the most directly related to the research topic, as it demonstrates the use of photographic images in the four investigations, with a frequency of 04 and a percentage of 21%, in addition to AI-generated images, which also recorded a frequency of 04 and a

percentage of 21%, as well as maps and charts, with the same frequency and percentage. Meanwhile, original documents recorded a frequency of 03 and a percentage of 16%, whereas videos and infographics each recorded a frequency of 02, representing 11%.

These percentages highlight the transition of digital investigative journalism from traditional text-based reporting toward multimedia storytelling approaches. More significantly, AI-generated images appeared in all four cases, representing a direct indicator of the integration of artificial intelligence into the visual processing and presentation of the analyzed sample.

This interpretation is supported by ARIJ's principles regarding the ethical use of artificial intelligence tools in investigative work. The platform indicates that artificial intelligence is employed in certain visual materials and segments, considering this use as AI-assisted rather than necessarily representing complete content generation from the beginning. It also emphasizes the importance of disclosing the use of artificial intelligence in the production of images and videos.

Table No. 07: Represents the Category of Artificial Intelligence Tools Used in Digital Investigative Investigations

Category of Artificial Intelligence Tools	Frequency	Percentage
AI image generators	04	100%
Chat GPT 4.0	00	00%
High charts AI	00	00%
Map Scraper	00	00%
Total	04	100%

Source: Prepared by the researcher based on the ARIJ platform.

The table related to the use of artificial intelligence tools in the digital investigative investigations constituting the study sample indicates that all four analyzed investigations incorporated artificial intelligence applications, reaching a percentage of 100%. In contrast, the percentages associated with the specifically identified tools, namely ChatGPT 4.0, High charts AI, and Map Scraper, recorded 0%.

This percentage indicates, at an initial level of interpretation, that the presence of artificial intelligence within the investigated sample is neither limited nor occasional; rather, it has become an integrated component of the digital investigative work environment. However, the nature of this presence requires careful analysis. The 100% presence of artificial intelligence does not necessarily imply that journalists relied on a specific generative tool for writing the investigations. Instead, it may reflect the use of artificial intelligence-based technologies or

applications during one or more stages of the investigative process, including research, data collection, data processing, analysis, verification, or the production of visual materials.

This interpretation corresponds with the perspective adopted by the ARIJ platform regarding artificial intelligence in journalism, as it considers AI a set of technologies that provide journalists with automated assistance and analytical support, helping them perform editorial, operational, and communication tasks, rather than replacing journalists or human investigative practices. This can also be explained by the nature of contemporary digital investigations, which increasingly depend on extensive datasets, digital sources, and multimedia content. Such complex environments cannot always be effectively managed through traditional methods alone.

ARIJ's artificial intelligence strategy confirms that among the main motivations for adopting these technologies are the challenges associated with analyzing large datasets, processing repetitive information, verifying content, and managing substantial quantities of digital sources and materials. ARIJ also considers artificial intelligence capable of supporting journalists in collecting and analyzing data, as well as identifying patterns and trends relevant to investigative processes.

Accordingly, artificial intelligence should not be viewed as the producer of the investigation itself, but rather as a technological intermediary within the investigative production process, contributing to strengthening journalists' ability to access, process, and analyze information.

On the other hand, the absence of the following tools: ChatGPT 4.0, High charts AI, and Map Scraper, despite ARIJ's official announcement of training journalists in their application within investigative journalism, can be explained by the specific characteristics of the analyzed sample.

ARIJ organized a workshop entitled "Data Journalism: Artificial Intelligence Applications in Investigative Journalism," which addressed the integration of artificial intelligence into the different stages of data collection, cleaning, analysis, and visualization. The workshop also included practical training on ChatGPT 4.0, High charts AI, and Map Scraper.

6. Study Results:

- Human rights and freedoms issues represent some of the most significant topics addressed in digital investigative investigations.

- The objectives of the investigations constituting the study sample are reflected in disclosure, documentation, and awareness-raising, while establishing links with sources and documents through the role of artificial intelligence in data collection and verification processes.

- The digital investigative investigations constituting the study field are characterized by a critical approach toward issues, reflecting ARIJ's orientation toward integrating artificial

intelligence tools into different stages of investigative work, including information collection, processing, and analysis.

- The visual structure of digital investigative investigations relies on AI-generated animated images to enhance the use of a multimedia-based digital environment.

- Artificial intelligence contributes to supporting the technical formats employed during the production stages of digital investigative investigations, particularly in the presentation of documents and evidence.

- Modern Standard Arabic ranked first in the production of digital investigative investigations, reflecting ARIJ's adoption of a dedicated artificial intelligence strategy in the Arabic language.

7. Conclusion:

This study provided an overview of the use of artificial intelligence technologies in certain stages of producing digital investigative investigations, considering them an important strategy adopted by the ARIJ platform as a digital media institution to adapt to technological developments in societies and facilitate investigative work on various issues. This represents a positive step toward strengthening the integration of artificial intelligence tools into Arab investigative journalism.

Regarding innovation, ARIJ has focused on adapting useful tools for journalistic practices, developing new tools, and integrating artificial intelligence into Arab journalism through the establishment of its own artificial intelligence strategies in Arabic, with the aim of supporting the efforts of Arab media institutions and contributing to the achievement of a shared journalistic identity.

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