



Original Article

## Exploratory Research for Drone Journalism in Jordan: Challenges and Opportunities

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**Abstract:** In media studies, there is a growing anticipation that uncrewed aerial vehicles, also known as drones, will assume a prominent role as a formidable tool in the next few years. The level of expectation is increasing. In recent years, there has been a noticeable rise in the use of uncrewed aerial vehicles (UAVs), also known as drones, throughout several domains of human activity. The first association with these devices was with the paparazzi. However, they have gained considerable importance as tools that aid journalists, news organizations, and individuals in gathering and disseminating relevant news. Using uncrewed aerial vehicles, often known as drones, has facilitated the acquisition of visually distinctive perspectives. One further benefit of drones is their capacity to explore new avenues in journalism that surpass the constraints imposed by conventional visual content. The primary objective of this study is to do exploratory research to obtain a comprehensive grasp of the field of drone journalism. This research aims to highlight drone journalism's numerous opportunities, particularly in Jordan, emphasizing its geographical position as the primary focus.

**Keywords:** Drone Journalism; Uncrewed Aerial Vehicles (UAVs); Visual Reporting; Media Innovation; Journalism in Jordan



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### 1. Introduction

Recent advancements in Artificial Intelligence (AI), which serve as a precursor for automated journalism and drones, have initiated discussions regarding the myriad opportunities they present, alongside the challenges and threats they pose to various fields of study and human existence. Recent advancements in Artificial Intelligence (AI), robotics, camera drones, and algorithmic news generation have transformed journalism narratives, extending beyond the influence of new media and social networking platforms such as Facebook, Twitter (X), Instagram, WhatsApp, and blogs. Salaverra and De-Lima-Santos (2020) forecasted that the domain of journalism would be significantly affected by this emerging technology. Robotic systems and Internet of Things (IoT) devices are pioneering novel methodologies for producing, consuming, and distributing journalistic content, converting the news business into a new paradigm termed omnipresent journalism.

Newsrooms worldwide are integrating various forms of Artificial Intelligence (AI) into news gathering, production, and dissemination. Western countries and China are at the forefront of AI development in newsrooms, experimenting with machine learning, automated content generation and moderation, and speech-to-text algorithms (Kothari &

Cruikshank, 2022). The news media and journalism sector has recently undergone significant transformations due to the advent of fourth industrial automation, characterized by the integration of Unmanned Aerial Vehicles (UAVs) or drone technology and the Internet of Things (IoT), which epitomizes a regime of profound digital automation in its modern existential process (Salaverra & De-Lima-Santos, 2020). Okocha, Agaku, and Ola-Akuma (2021) assert that Unmanned Aerial Vehicles (UAVs), a burgeoning technology in the news media sector, are rapidly transforming journalistic practices in the twenty-first century, especially in the news collection process within tumultuous or hazardous environments.

Undoubtedly, the rapid advancement of information and communication technologies (ICTs) has brought significant transformations to the delivery of mass communication services. As a result, this has led to new forms of digital journalism. The influence of social media and the extensive availability of user-generated content (UGC) has profoundly impacted the production and distribution of news, infotainment services, multimedia content, and digital information across various online platforms, including the Internet and social networking sites (Ntalakas et al., 2017). The swift rise in the use of smart devices and corresponding advancements in mobile computing technologies has propelled this phenomenon. Many devices, such as smartphones and tablets, offer inherent networking capabilities and improved functionalities for creating, editing, and sharing multimedia. Furthermore, features like GPS, clocks, and device owner data are integrated into the technology, enabling the delivery of contextually and geographically relevant information and services (Rodrigues & Lloret, 2014; Dimoulas & Symeonidis, 2015; Papadopoulos et al., 2015). Similar to these advancements, the evolving role of journalists and the larger landscape of journalism are expected to be shaped by emerging technologies, specifically focusing on enhancing audience engagement through immersive experiences.

In recent years, the visual storytelling industry has emerged with affordable, user-friendly, remotely piloted aircraft, often called uncrewed aerial vehicles or camera drones (Ehondor, 2023). Newsrooms have historically employed various methods, such as drones, balloons, planes, chopper rentals, cranes, and similar means, to integrate visually striking images and videos captured from an elevated perspective into their reporting (Uskali et al., 2020). However, regardless of their size or available resources, news organizations can use drones as the first practical and accessible tool for aerial imaging, overcoming the traditional limitations of cost and accessibility.

The use of uncrewed aerial vehicles (UAVs), also known as drones, within journalism has prompted inquiries about their application and potential consequences, particularly concerning the ethical considerations upheld by local and international professional media organizations. (Ferguson, 2019). The present discussion is relevant, particularly in light of the widespread use of drone technology in newsgathering and investigative reporting. Drones were once characterized as uncrewed aerial vehicles that were first used for military applications. Nevertheless, these tools have transformed, including various applications such as journalism (Gynnild & Uskali, 2018; Hamilton, 2020; Uskali et al., 2020) and television. In journalism, the utilization of uncrewed aerial vehicles (UAVs), often known as drones, is a noteworthy illustration of the dissemination of innovation. It is crucial to acknowledge the presence of some limitations and restrictions, particularly in the context of media ethics, which pertain to the ethical principles and norms seen in media, including both conventional and new media platforms. This emphasis on ethics in drone journalism is a call to action for all involved to uphold the highest standards of responsibility and integrity.

## 2. Literature Review

Within the field of journalism, the use of drone technology serves as a prime illustration of disruptive innovation, a term coined by Bower and Christensen (1995), Christensen (2013), and Christensen and Raynor (2013) to describe a new technology that significantly alters how a market or industry functions. Camera drones have emerged as a viable alternative for reporters seeking aerial imagery, reducing their reliance on traditional methods like renting helicopters or cranes. While camera drones may not match the capabilities of mainstream technologies such as helicopters in certain aspects, they offer advantages in terms of speed and cost-effectiveness. Additionally, drones can capture videos from previously inaccessible areas, thus expanding the visual possibilities for reporters (Gynnild, 2014b). Previous studies on drone journalism have shown that scholars focus on ethical concerns related to journalists' well-being, including privacy and safety (Culver, 2014; Silva, 2016; Gynnild, 2014a; Tremayne & Clark, 2014). Empirical research has provided evidence illustrating the challenges drone reporters face as they navigate the intersection of technological advancements and adherence to professional ethical standards.

In contrast, an emerging community of fans in the field of drone startups is redefining the conventional understanding and expectations of visual journalism (Giones & Brem, 2017). Furthermore, educators in higher education face new and unforeseen challenges when developing curricula for drone courses (Marron, 2013). The enduring implications of this organization are significant in light of the ongoing examination of press freedom worldwide via camera drones (Lauk et al., 2016). In a society increasingly reliant on drones, legislators and government officials are confronted with complex logistical challenges concerning the operation of uncrewed aerial vehicles in lower airspace (Rao et al., 2016; Çıkmak et al., 2023). International aviation rules are still being debated, as different governments do not agree on classifying military, commercial, and civilian drone uses and how to align regulatory frameworks to meet

those needs (Gynnild & Uskali, 2018). According to Silva (2016), significant differences exist in how countries regulate privacy, impacting the use of drones for commercial purposes, including journalism.

Moreover, Howley (2018) asserts that the interplay between technology and culture is a subject of scrutiny. The author posits that media discourse is pivotal in developing emerging technologies, comprehending their various applications across human endeavors, and facilitating their integration into the fabric of daily life. Drone technology has facilitated the democratization of aerial vantage points, locations, and previously unavailable viewpoints. This advancement has also introduced novel opportunities for journalists regarding data collection, sensory experiences, and geographic recording (Kreimer, 2018). Airborne drones have emerged as a viable alternative to manned and analog remote-control aircraft, offering enhanced safety, cost-effectiveness, accessibility, and ease of operation. These technological advancements have opened new avenues for storytelling from an airborne perspective.

The use of uncrewed aerial vehicles (UAVs), also known as drones, in journalism, facilitates the acquisition of visual content by journalists, allowing them to capture video of significant news events, including but not limited to volcanic eruptions, areas affected by armed conflicts, and occurrences of natural disasters. Given their remote operation, journalists view this technical advancement as a safer and more cost-effective method for video recording, particularly in high-risk areas. According to Goldberg et al. (2013), drone journalism holds significant promise in capturing video without subjecting journalists to observation or placing them in potentially hazardous locations where sending reporters would be ill-advised due to the associated risks. Therefore, they are instrumental in investigative journalism. Unmanned aerial systems (UAS) have surged in popularity recently and are used for various purposes in commercial and personal domains. Drone delivery within the logistics industry can be used for several essential reasons. In contemporary times, drones have emerged as versatile tools with various applications. However, their initial development was mainly for military purposes due to the inherent hazards faced by troops operating human-crewed aircraft (Springer, 2013).

## 2.1. Artificial Intelligence (AI)

The phrase Artificial Intelligence (AI) is a prominent idea in modern literature. In other words, AI is a topic researcher across several disciplines strive to use for its significance and relevance in their domains. Manning et al. (2022) assert that the term AI. He characterized AI as the discipline and technology of creating intelligent machines. Historically, research on AI predominantly focused on human programming of machines to exhibit intelligent behavior, such as playing chess; however, contemporary emphasis has shifted towards machines' capacity to learn in a manner partially analogous to humans (Manning et al., 2022). Pereira et al. (2021) conceptualize AI as a subset of computer/mathematical science dedicated exclusively to developing intelligent computers capable of doing various tasks that need human intellect. These robots are constructed to reason about information, observe their surroundings, and learn from prior experiences. The primary objective of AI specialists is to create algorithms and models capable of replicating and simulating cognitive capabilities, such as problem-solving (Hussain, 2023). The indicates that AI specialists aim to facilitate robots in emulating human cognition, although in a manner that transcends human thought processes (Misselhorn, 2018). Artificial intelligence enables computers to independently gather and analyze data from their surroundings to make choices, resolve issues, and execute activities that typically need human cognition (Von Krogh, 2018). According to Singh (2018), AI is progressively incorporated into workflows to improve task performance and efficiency.

## 2.2. Automated Journalism

Schapals and Porlezza (2020) assert that because of the nascent nature of automated journalism, there has been little scholarly inquiry into the subject. Several prior studies, however, have tried to elucidate the issue further. These include experimental experiments in which journalists could use the software directly (Thurman et al., 2017). Carlson (2014) posits that automated journalism has the most significant potential for disruption among the growing data-centric methodologies in journalism. The notion pertains to algorithmic processes that, beyond initial programming choices, convert data into narrative news articles with little or no human involvement. Graefe (2016) asserts that automated journalism offers limitless opportunities for producing a vast array of stories in multiple languages within a remarkably brief timeframe, allowing management to enhance profit margins while decreasing production expenses. Consequently, various contemporary solutions exist, from simple code that extracts figures from a database to complete pre-written template narratives to more intricate methods that analyze data to derive additional insights and generate more compelling stories. The latter originated from the data-intensive domain of sports journalism and depends on big data analytics and Natural Language Generation (NLG) technology.

Initially, Automated Insights and Narrative Science, two prominent US providers of NLG technology, developed algorithms to autonomously generate summaries of sporting events (Graefe, 2016). Schapals and Porlezza (2020) assert that, in an already cacophonous digital news landscape, there is a prevalent apprehension that a proliferation of accessible articles may lead to information overload and a diminished sense of direction. Graefe et al. (2016) affirm that

"an increasing quantity of available news will further augment individuals' burden to identify news that is most pertinent to them." Nonetheless, should technology ultimately lead to the gradual elimination of such entry-level positions, algorithms cannot fill the gap left by human journalists. Algorithms are limited in their ability to oversee society and fulfill journalistic duties, such as guidance and shaping public opinion, due to their incapacity to analyze data or demonstrate causality (Graefe et al., 2016). In other words, algorithms can elucidate what is happening but not the underlying reasons (Haim & Graefe, 2017). Consequently, it was proposed that journalists focus on enhancing their skills to get a competitive advantage against increasing automation by refining their capabilities in in-depth analysis and investigative reporting (Graefe et al., 2016).

Research has elucidated journalists' perceptions of automated journalism and its implications for the profession. According to the "man versus machine" framework, journalists believe that automated journalism can assume their jobs in the newsroom, consequently impacting their livelihoods. Nonetheless, this transition aids in comprehending how journalists maneuver through a perpetually changing landscape to ascribe significance to their endeavors (Deuze, 2005) and to grasp "how these technologies reproduce, embody, or modify norms of professional ideology" (Young & Hermida, 2014).

### 2.3. Drone Journalism

Drone journalism, an innovative media domain, focuses on transforming the methods of news acquisition and dissemination. It entails using Unmanned Aerial Vehicles (UAVs), sometimes called drones, to provide new perspectives to journalism. Ntalakas et al. (2017) cite Matt Waite, a prominent expert in the industry, asserting that drones broaden the scope of journalism by providing a flexible and economical method for aerial access and documentation of news events and phenomena. This method, often known as "drone reporting," incorporates UAVs outfitted with cameras and other sensors into news reporting and narrative. Drones, outfitted with cameras and sensors, provide journalists with a unique aerial perspective, enabling the documentation of many news events, ranging from natural catastrophes to human interest narratives. This visual and audio data may provide novel perspectives on narratives. Moreover, drone journalism is the realization of a visual storyteller's aspiration. It entails recounting narratives via aerial imagery obtained by drones. These UAVs enable journalists to provide immersive, captivating pictures that surpass conventional reporting techniques, making them an exhilarating asset in the contemporary journalist's arsenal. Fundamentally, drone journalism prioritizes openness and accountability. Journalists consistently disseminate information about the drones they use, their chosen methodologies, and the ethical aspects they contemplate. This openness is crucial for facilitating a clear comprehension of how the narrative was documented and conveyed to the public, as highlighted by experts in the area (Holton et al., 2014). Ultimately, drone journalism enhances the discipline of journalism in several capacities. In addition to aesthetic value, it provides the audience with a profound comprehension of intricate topics and events, facilitating informed decision-making and possibly instigating change. Drone journalism enhances narrative by offering a novel perspective and facilitating access to inaccessible regions, as shown by Waite's research and other specialists in the domain (Holton et al., 2014).

### 2.4. Challenges for the drone Journalism

The emergence of drone journalism has faced numerous challenges. Privacy is a significant issue that deserves attention. Using camera-equipped drones can unintentionally capture the visual content of individuals without their explicit consent, raising ethical concerns about violations of personal privacy (Selva, 2023). To address this issue, there has been a call for journalists to adhere strictly to ethical standards and seek permission whenever possible. However, there is also the need for proper training and regulation. Operating a drone requires specific skills and expertise, leading journalists to pursue training to ensure drones' safe and effective use (Uskali, 2018). Moreover, it is vital to establish comprehensive laws that govern the use of uncrewed aerial vehicles (UAVs) in journalism, aiming to reduce potential abuse and promote responsible practices (Okocha et al., 2021). Despite these challenges, the rise of drone journalism has undeniably produced positive outcomes in journalism. This technology has allowed journalists to tell stories in new and innovative ways, captivating audiences and providing a fresh perspective on events (Barrero, 2018). The utilization of uncrewed aerial vehicles (UAVs), commonly known as drones, has experienced a significant increase in recent times. This rise has been essential in improving the speed and efficiency of news gathering, enabling journalists to deliver timely coverage of unfolding events (Frackiewicz, 2023).

## 3. Materials and Methods

This research study uses the integrated literature review approach to examine the topic thoroughly. Christmals & Gross (2017, p.7) define an integrative literature review method as a non-experimental approach wherein researchers objectively evaluate, summarise, and draw conclusions regarding a specific topic through systematic searching, categorization, and thematic analysis of prior qualitative and quantitative research studies related to the subject under examination. The aforementioned technique can allow researchers to objectively analyze, summarise, and draw

conclusions from data acquired from the literature on AI, automated, and drone journalism in Jordan. Nonetheless, due to the subjective character of this approach, the outcomes of this research cannot be extrapolated to a broader population.

## 4. Results

### 4.1. Challenges for the drone Journalism in Jordan:

The increasing progression of technology has led to a surge in the utilization of drones within journalism. This surge may be attributed to the drones' capacity to collect aerial views, offering a unique and alternative viewpoint in news reporting. Nonetheless, the implementation of drone journalism in Jordan encounters several obstacles, including legal limits, technical constraints, ethical considerations, public perception, security concerns, and financial limitations. The primary objective of this exploratory research is to comprehensively analyze the obstacles encountered within the drone journalism sector in Jordan from a critical perspective. Legal restrictions: Strict legal restrictions and regulatory measures prevent the practice of drone journalism in Jordan. The use of drones for journalistic purposes in Jordan is subject to regulatory restrictions imposed by the government, which necessitate the acquisition of licenses, permits, and clearances. These requirements have the potential to hinder the effective functioning of drone journalists. Implementing these restrictions is important to safeguard national security and uphold private rights. However, finding a harmonious equilibrium promoting responsible and ethically sound drone journalism is crucial.

Technological Constraints: Notwithstanding the progress made, drone technology encounters some constraints that impede its effectiveness in journalism. Many factors, such as a very short battery life, a limited flight time, and difficulties maneuvering the drones, make using drones for journalism in Jordan difficult. Furthermore, it is important to consider several technological challenges that might affect the accuracy and dependability of drone video in the context of news reporting. These challenges include GPS interference, signal interruption, and adverse weather conditions. The presence of these obstacles has the potential to undermine the authenticity and credibility of drone-based news coverage. Drone journalism elicits ethical issues about privacy infringement, encroachment upon personal domains, and possible hazards to public welfare. Ensuring a delicate equilibrium between the welfare of the general public and the protection of individual privacy rights emerges as a matter of utmost significance for journalists using drones in their professional endeavors. Furthermore, it is essential to develop ethical rules and regulations to guarantee the responsible and impartial use of drones in journalism. These guidelines should specifically address concerns related to voyeurism and sensationalism that may arise from using such technology.

Public Perception: The perception of drone journalism among the general public in Jordan may be a significant obstacle. Apprehensions around monitoring, intrusion, and the possibility of drone misuse have the potential to undermine public confidence in the journalistic use of this technology. Enhancing public knowledge, fostering consciousness, and highlighting the ethical and accountable use of uncrewed aerial vehicles (UAVs) may contribute to cultivating a more favorable picture of drone journalism. Security considerations are of utmost importance while deploying drone journalism in Jordan, considering the region's geopolitical environment. Security authorities may enact strict laws and restrictions due to malicious entities' potential use of drones to conduct surveillance or gather intelligence. The broad use of drone journalism necessitates the prioritization of security and integrity in drone operations, with the consideration of national security considerations.

The implementation of drone journalism in Jordan is subject to substantial budgetary constraints. Significant costs might be incurred for procuring high-quality uncrewed aerial vehicles, camera apparatus, educational initiatives for journalists, and adherence to legal obligations. The cost load and restricted budget allocations for media organizations may hinder the expansion of drone journalism in Jordan. The proficiency and knowledge required for journalists to use drones properly include comprehensive training in drone operation, picture analysis, editing, and narrative approaches tailored explicitly to aerial images. Implementing specialized training programs tailored for journalists, specifically emphasizing drone operation and ethics, would effectively cater to the need for enhanced proficiency in this field. Moreover, such initiatives would facilitate the integration and widespread acceptance of drone journalism within the context of Jordan.

Jordan's diversified landscape, which includes mountains, deserts, archaeological sites, and refugee camps, creates significant infrastructure hurdles when operating drones. Limited access, unpredictable power supply, and a lack of communication networks in distant places further complicate drone deployment and operating effectiveness. Resolving these infrastructure obstacles requires collaborating with governmental entities, media institutions, and technology suppliers. The field of drone journalism creates substantial quantities of data, hence requiring the implementation of resilient storage and management solutions. The establishment of robust mechanisms for safeguarding the transmission and storage of data acquired by uncrewed aerial vehicles (UAVs), often known as drones, is paramount to prevent unauthorized access to sensitive information, preserve the integrity of journalistic endeavors, and defend fundamental rights to privacy. The establishment of robust technical infrastructure and the

implementation of appropriate rules are essential prerequisites for ensuring effective data management in the field of drone journalism.

#### **4.2. Opportunities for the drone Journalism in Jordan:**

Drone journalism uses uncrewed aerial vehicles (UAVs) to capture aerial imagery or videos to report stories and disseminate news. These aerial gadgets have the potential to provide a novel vantage point on various events, enhancing narrative via the acquisition of film from perspectives that were previously unattainable. In Jordan, where journalism is significant in upholding democratic principles, incorporating drone technology can potentially have a transformative impact on news coverage, enhancing the overall reporting standard. The augmentation of news coverage The use of drone journalism in Jordan would enable journalists to collect visual content that is beyond the reach of conventional means. Drones can capture high-resolution aerial perspectives of densely populated public gatherings, exhibit inaccessible geographical areas, and record the progress of current development endeavors. The proposed extension of coverage would provide the general public with a more exhaustive and precise portrayal of occurrences, fostering a more profound comprehension of intricate matters.

Enhanced circumstances for reporting securely The use of drone technology in journalism has the potential to alleviate the many hazards encountered by journalists operating in Jordan. The nation has encountered political turmoil and security complications, making on-site journalism perilous. Using uncrewed aerial vehicles, often known as drones, enables journalists to collect essential material while mitigating the risks associated with direct exposure to hazardous situations. This not only helps journalists in terms of their safety but also guarantees the comprehensive coverage of significant news stories while safeguarding the welfare of reporters. The augmentation of monitoring measures and the implementation of enhanced accountability mechanisms the use of uncrewed aerial vehicles (UAVs), also known as drones, in journalism, facilitates enhanced surveillance of public areas and occurrences, fostering a culture of openness and responsibility. In the context of Jordan, this technological advancement has the potential to mitigate instances of corruption, oversee political campaigns, and guarantee adherence to regulatory frameworks. The utilization of drones to collect aerial video has the potential to provide visual substantiation to bolster investigations and ensure that authorities are held responsible for their conduct.

The preservation of cultural and environmental aspects Jordan has a plethora of historical landmarks, awe-inspiring scenery, and a profound cultural history. Using drone technology in journalism may play a pivotal role in documenting and conserving these various elements. Drones can potentially contribute value to the preservation of Jordanian culture and promote awareness of the country's legacy by collecting visually captivating aerial imagery of significant monuments, archaeological sites, and natural marvels. The provision of educational opportunities the use of drone technology in journalism has significant educational prospects within the context of Jordan. By integrating this technology into journalism curricula, prospective journalists may gain hands-on expertise using uncrewed aerial vehicles for narrative purposes. This novel methodology not only imparts technical proficiencies to journalism students but also fosters the use of imaginative storytelling methods that have the potential to captivate viewers in a captivating manner.

The economic advantages the incorporation of drone journalism can potentially contribute to Jordan's economic development. This technology allows media companies to appeal to local and global audiences searching for distinctive and engaging content. Furthermore, the drone business has the potential to provide job opportunities in many capacities, such as professional operators, technicians, and managers. This would have a positive impact on both the media and technology sectors. The progress in media technologies in Jordan has always been at the forefront of embracing and implementing emerging technology. Drone journalism, because of its proactive stance towards innovation, is aligned with the nation's envisioned trajectory for the future of media. By embracing this technological progress, Jordan has the potential to establish itself as a central location for innovative journalism, therefore drawing skilled professionals and financial resources from the surrounding area. The promotion of public participation and the cultivation of awareness among the general population. Uncrewed aerial vehicles can attract audiences and facilitate public involvement. The use of aerial footage enhances the visual appeal and accessibility of news articles. The increased participation level may raise awareness of significant social and environmental concerns, fostering a more knowledgeable and engaged population in Jordan.

### **5. Conclusions**

Using drone technology in journalism presents numerous opportunities within the Jordanian media environment. Implementing uncrewed aerial vehicles (UAVs), commonly called drones, in journalism can bring several advantages. These benefits include enhancing news coverage, improving safety measures, promoting transparency, and facilitating cultural preservation. By fully embracing this innovative approach, Jordan has the potential to lead the future of journalism, share impactful news stories, and contribute significantly to the advancement of media technology on an international scale. Using AI and drones in Jordanian journalism presents complex technical, infrastructural, economic,

cultural, and ethical obstacles. As Jordan attempts to keep pace with global advancements in AI, it is imperative for stakeholders, including journalists, technologists, and legislators, to collaborate and address these issues while upholding the ethical standards that support high-quality and impartial media. The future of Jordanian journalism will depend on effectively navigating these challenges and utilizing AI to enhance the quality and distribution of news reporting. Ultimately, as change is the only constant in life and advancements in ICT and the internet are neutral by nature, depending on individual use, it has become essential for journalists to safeguard their professional integrity diligently. This requires adopting a "man-machine marriage," where journalists, AI, news automation, and robotics work closely together. In this framework, algorithms will analyze data, identify compelling stories, and generate initial drafts, which journalists will enrich with in-depth insights through interviews with key individuals.

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## References

- Barrero, M. Á. F. (2018). Journalism and drones. Challenges and opportunities of the use of drones in news production. *Doxa Comunicación*, (26).
- Bower, J. L., & Christensen, C. M. (1995). Disruptive technologies: catching the wave.
- Carlson, M. (2014). The Robotic Reporter. *Digital Journalism*, 3(3), 416–431. <https://doi.org/10.1080/21670811.2014.976412>
- Christensen, C. M. (2013). The innovator's dilemma: when new technologies cause great firms to fail. Harvard Business Review Press.
- Christensen, C., & Raynor, M. (2013). The innovator's solution: Creating and sustaining successful growth. Harvard Business Review Press.
- Christmals, C. D., & Gross, J. J. (2017). An integrative literature review framework for postgraduate nursing research reviews. *Eur. J. Res. Med. Sci.[Internet]*, 5(1).
- Çıkmak, S., Kırbaç, G., & Kesici, B. (2023). Analyzing the Challenges to Adoption of Drones in the Logistics Sector Using the Best-Worst Method. *Business and Economics Research Journal*. <https://doi.org/10.20409/berj.2023.413>
- Culver, K. B. (2014). From Battlefield to Newsroom: Ethical Implications of Drone Technology in Journalism. *Journal of Mass Media Ethics*, 29(1), 52–64. <https://doi.org/10.1080/08900523.2013.829679>
- Deuze, M. (2005). What is journalism? *Journalism*, 6(4), 442–464. <https://doi.org/10.1177/1464884905056815>
- Dimoulas, C. A., & Symeonidis, A. L. (2015). Syncing Shared Multimedia through Audiovisual Bimodal Segmentation. *IEEE MultiMedia*, 22(3), 26–42. <https://doi.org/10.1109/mmul.2015.33>
- Ehondor, B. (2023). Drone journalism and professional media ethics imperative discourse. *International Journal of Development and Management Review*, 18(1), 32–48. <https://doi.org/10.4314/ijdmr.v18i1.3>
- Ferguson, D. A., & Greer, C. F. (2019). Assessing the Diffusion of Drones in Local Television News. *Electronic News*, 13(1), 23–33. <https://doi.org/10.1177/1931243119829430>
- Frąckiewicz, M. (2023, October 18). A New Frontier in Journalism: How Drones are Changing the Way News is Reported in Cameroon. <https://ts2.space/en/a-new-frontier-in-journalism-how-drones-are-changing-the-way-news-is-reported-in-cameroon/#gsc.tab=0>
- Giones, F., & Brem, A. (2017). From toys to tools: The co-evolution of technological and entrepreneurial developments in the drone industry. *Business Horizons*, 60(6), 875–884. <https://doi.org/10.1016/j.bushor.2017.08.001>
- Goldberg, D., Corcoran, M., & Picard, R. G. (2013). Remotely Piloted Aircraft Systems; Journalism; Opportunities and Challenges of Drones in News Gathering, Reuters Institute for the Study of Journalism.



Graefe, A. (2016). Guide to automated journalism.

Graefe, A., Haim, M., Haarmann, B., & Brosius, H. (2016). Readers' perception of computer-generated news: Credibility, expertise, and readability. *Journalism*, 19(5), 595–610. <https://doi.org/10.1177/1464884916641269>

Gynnild, A. (2014a). Journalism innovation leads to innovation journalism: The impact of computational exploration on changing mindsets. *Journalism*, 15(6), 713–730. <https://doi.org/10.1177/1464884913486393>

Gynnild, A. (2014b). The Robot Eye Witness. *Digital Journalism*, 2(3), 334–343. <https://doi.org/10.1080/21670811.2014.883184>

Gynnild, A., & Uskali, T. (2018). *Responsible Drone Journalism*. <https://doi.org/10.4324/9781315163659>

Haim, M., & Graefe, A. (2017). Automated news. *Digital Journalism*, 5(8), 1044–1059. <https://doi.org/10.1080/21670811.2017.1345643>

Hamilton, J. F. (2020). Drone Journalism as Visual Aggregation: Toward a Critical History. *Media and Communication*, 8(3), 64–74. <https://doi.org/10.17645/mac.v8i3.3117>

Holton, A. E., Lawson, S., & Love, C. (2014). Uncrewed aerial vehicles. *Journalism Practice*, 9(5), 634–650. <https://doi.org/10.1080/17512786.2014.980596>

Howley, K. (2018). Drones: Media discourse and the public imagination. Peter Lang Incorporated, International Academic Publishers.

Hussain, A. (2023). Use of artificial intelligence in the library services: prospects and challenges. *Library Hi Tech News*, 40(2), 15–17. <https://doi.org/10.1108/lhtn-11-2022-0125>

Kothari, A., & Cruikshank, S. A. (2021). Artificial Intelligence and Journalism: An Agenda for Journalism Research in Africa. *African Journalism Studies*, 43(1), 17–33. <https://doi.org/10.1080/23743670.2021.1999840>

Kreimer, B. (2018). Drone Journalism: Storytelling from a New Perspective. *Digital Investigative Journalism*, 91–102. [https://doi.org/10.1007/978-3-319-97283-1\\_9](https://doi.org/10.1007/978-3-319-97283-1_9)

Lauk, E., Uskali, T., Kuutti, H., & Hirvinen, H. (2016). Drone journalism: The newest global test of press freedom. Freedom of expression and media in transition: studies and reflections in the digital age, 117–125.

Manning, L., Brewer, S., Craigon, P. J., Frey, J., Gutierrez, A., Jacobs, N., Kanza, S., Munday, S., Sacks, J., & Pearson, S. (2022). Artificial intelligence and ethics within the food sector: Developing a common language for technology adoption across the supply chain. *Trends in Food Science & Technology*, 125, 33–42. <https://doi.org/10.1016/j.tifs.2022.04.025>

Marron, M. B. (2013). Drones in Journalism Education. *Journalism & Mass Communication Educator*, 68(2), 95–98. <https://doi.org/10.1177/1077695813486973>

Misselhorn, C. (2018). Artificial Morality. Concepts, issues and challenges. *Society*, 55(2), 161–169. <https://doi.org/10.1007/s12115-018-0229-y>

Ntalakas, A., Dimoulas, C. A., Kalliris, G., & Veglis, A. (2017). Drone Journalism: Generating Immersive Experiences. *Journal of Media Critiques*, 3(11), 187–199. <https://doi.org/10.17349/jmc117317>

Okocha, D. O., Agaku, T., & Ola-Akuma, R. O. (2021). Drone journalism: The empirical arguments for its utilization in investigative journalism in Nigeria. *Human Discourse*, 1(4).

Okocha, D. O., Agaku, T., & Ola-Akuma, R. O. (2021). Drone journalism: The empirical arguments for its utilization in investigative journalism in Nigeria. *Human Discourse*, 1(4).

Papadopoulos, S., Cesar, P., Shamma, D. A., Kelliher, A., & Jain, R. (2015). Social Multimedia and Storytelling [Guest editors' introduction]. *IEEE MultiMedia*, 22(3), 10–13. <https://doi.org/10.1109/mmul.2015.68>

Pereira, V., Hadjielias, E., Christofi, M., & Vrontis, D. (2021). A systematic literature review on the impact of artificial intelligence on workplace outcomes: A multi-process perspective. *Human Resource Management Review*, 33(1), 100857. <https://doi.org/10.1016/j.hrmr.2021.100857>

Rao, B., Gopi, A. G., & Maione, R. (2016). The societal impact of commercial drones. *Technology in Society*, 45, 83–90. <https://doi.org/10.1016/j.techsoc.2016.02.009>

Rodrigues, J. J., Lin, K., & Lloret, J. (Eds.). (2014). Mobile Networks and Cloud Computing Convergence for Progressive Services and Applications. *Advances in Wireless Technologies and Telecommunication*. <https://doi.org/10.4018/978-1-4666-4781-7>

Salaverria, R., & De-Lima-Santos, M. (2020). Towards ubiquitous journalism: Impacts of IoT on news. In *Studies in big data* (pp. 1–15). [https://doi.org/10.1007/978-3-030-36315-4\\_1](https://doi.org/10.1007/978-3-030-36315-4_1)

Schapals, A. K., & Porlezza, C. (2020). Assistance or resistance? Evaluating the intersection of automated journalism and journalistic role conceptions. *Media and Communication*, 8(3), 16–26. <https://doi.org/10.17645/mac.v8i3.3054>



- Selva, M. (2023, October 9). Meera Selva, Chief Executive Officer of Internews Europe, dissects the main issues facing journalism around the world today. <https://internews.org/blog/five-challenges-for-journalism/>
- Silva, J. C. (2016). Legal and ethical state of drone journalism in Andean Community countries. In Conference Paper, Quite (pp. 15-16).
- Singh, K. K. (2018). An Artificial Intelligence and Cloud Based Collaborative Platform for Plant Disease Identification, Tracking and Forecasting for Farmers. *International Conference on Cloud Computing in Emerging Markets (CCEM)*, 49–56. <https://doi.org/10.1109/ccem.2018.00016>
- Springer, P. J. (2013). Military robots and drones: a reference handbook. ABC-CLIO.
- Strauss, A. L. (2017). The discovery of grounded theory: Strategies for qualitative research. Routledge.
- Thurman, N., Dörr, K., & Kunert, J. (2017). When Reporters Get Hands-on with Robo-Writing. *Digital Journalism*, 5(10), 1240–1259. <https://doi.org/10.1080/21670811.2017.1289819>
- Tremayne, M., & Clark, A. (2014). New Perspectives from The Sky. *Digital Journalism*, 2(2), 232–246. <https://doi.org/10.1080/21670811.2013.805039>
- Uskali, T. (2018). Towards journalism everywhere: the new opportunities and challenges of real-time news streams in Finland. *Digital Formations*, (116).
- Uskali, T., Manninen, V., Ikonen, P., & Hokkanen, J. (2020). Diffusion of Drone Journalism: The Case of Finland, 2011–2020. *Media and Communication*, 8(3), 75–84. <https://doi.org/10.17645/mac.v8i3.3075>
- Von Krogh, G. (2018). Artificial Intelligence in Organizations: New Opportunities for Phenomenon-Based Theorizing. *Academy of Management Discoveries*, 4(4), 404–409. <https://doi.org/10.5465/amd.2018.0084>
- Young, M. L., & Hermida, A. (2014). From Mr. and Mrs. Outlier To Central Tendencies. *Digital Journalism*, 3(3), 381–397. <https://doi.org/10.1080/21670811.2014.976409>