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Artificial Intelligence and the transformation of journalism: A systematic review of opportunities, challenges, and ethical implications

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Abstract

Background: Over the past decade, advances in machine learning, natural language processing, and generative artificial intelligence have enabled news organizations to automate routine reporting tasks, enhance investigative capabilities, and deliver content tailored to increasingly segmented audiences.

Aims: This paper presents a systematic review of scholarly literature on the integration of AI into journalism, covering studies published between 2010 and 2025.

Methodology: Drawing on research from diverse geographical contexts and methodological approaches, it synthesizes findings on AI's technological capabilities, its economic and ethical implications, and its broader societal impact on the news ecosystem.

Findings: The review identifies AI's transformative role in automating routine reporting, enhancing investigative journalism, enabling personalized content delivery, and streamlining newsroom operations. However, it also reveals significant concerns regarding transparency, accountability, bias, audience trust, and the erosion of human editorial oversight. The findings highlight regional disparities in adoption, shaped by technological infrastructure, market readiness, and policy environments, underscoring the need for context-sensitive approaches to AI governance. By mapping prevailing trends and identifying underexplored dimensions—such as cross-cultural differences in adoption, long-term effects on democratic deliberation, and evolving newsroom ethics—this study provides an evidence-based foundation for policymakers, media professionals, and researchers.

Conclusion: While AI holds the potential to enhance journalism's efficiency, reach, and innovation, its responsible implementation requires robust ethical standards, governance frameworks, and sustained human involvement to safeguard the profession's democratic role.

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1. Introduction

Over the past decade, advances in machine learning, natural language processing, and generative artificial intelligence have enabled news organizations to automate routine reporting tasks, enhance investigative capabilities, and deliver content tailored to increasingly segmented audiences (Porlezza & Schapals, 2024; Wu, 2024; Mitova et al., 2023; Harb & Arafat, 2024; Toff & Simon, 2025; Chen & Thorson, 2024). These technological developments have generated both optimism—particularly in terms of efficiency gains—and skepticism, especially regarding their potential impact on journalistic integrity, economic sustainability, and the health of democratic discourse.

One of the most prominent applications of AI in journalism is *automated content generation*. Algorithmic systems are now capable of producing structured news reports in domains such as financial earnings, sports results, and election outcomes with minimal human input. For example, the Associated Press has reported a significant increase in content output following the adoption of automated reporting tools, thereby freeing human journalists to focus on more complex and investigative assignments. In addition, AI supports various newsroom functions, including transcription, translation, metadata tagging, and trend analysis—streamlining the production process and enabling near real-time content delivery across multiple languages.

In investigative journalism, AI is increasingly deployed to handle tasks that were previously time- and labor-intensive. Data scraping, pattern recognition in large datasets, and summarization of complex materials can now be conducted at scale (Sabbar & Habib Zadeh Khiyaban, 2023), enabling journalists to uncover stories that might otherwise remain obscured. Prototypes integrating large language models with user-guided programming have been used to automate repetitive tasks in investigative workflows, potentially reducing the time needed for complex investigations from months to weeks.

AI's influence extends beyond content creation into news distribution. Recommendation algorithms and AI-driven personalization systems shape what content audiences see, often with the intention of enhancing engagement. While these systems can improve relevance for individual users, they also risk reinforcing ideological echo chambers and deepening the problem of selective exposure. This dynamic raises concerns about the erosion of a shared public sphere and the potential marginalization of minority viewpoints.

Despite these advances, the integration of AI into journalism raises profound ethical and professional challenges. Empirical surveys indicate that substantial proportions of news consumers express discomfort with news produced primarily by AI, particularly in sensitive domains such as political reporting, crime coverage, and local news. Concerns center on the perceived lack of human judgment, accountability, and contextual sensitivity—qualities that are central to

public trust in journalism. Instances of factual inaccuracies, plagiarism, and lack of attribution in AI-generated news content have been widely reported, underscoring the risks of relying on automated systems without robust editorial oversight.

Economic considerations further complicate this landscape. The growing use of AI-generated search summaries and news digests by technology companies has begun to diminish direct traffic to news organizations' websites. This shift has been linked to notable reductions in advertising revenue and audience engagement for established media outlets, intensifying the sector's already fragile financial conditions. Moreover, the consolidation of AI infrastructure within a small number of major technology firms amplifies concerns about institutional dependence and the possibility of misaligned incentives between platform providers and journalistic enterprises.

Ethical concerns likewise involve the dangers posed by algorithmic bias, limited transparency in automated decision-making, and the potential displacement of journalistic labor. AI systems trained on skewed or incomplete datasets may reproduce or heighten existing social inequalities. Recent critical reviews of AI deployment in other high-stakes domains similarly demonstrate how opaque, data-driven systems can amplify bias and evade clear lines of responsibility, reinforcing the need for strong oversight and explainable decision processes (Salehi et al., in press). Additionally, the proprietary design of many AI tools adopted in newsrooms restricts transparency, hindering audiences and regulators from assessing how information is generated, organized, and distributed. Questions of accountability in instances of error or harm remain unresolved, as responsibility is dispersed across both human and algorithmic agents.

In response to these challenges, some news organizations have begun implementing internal guidelines to govern AI use, emphasizing transparency, accuracy, and human oversight. Others have negotiated licensing agreements with AI developers to regulate the use of their content in model training and to create new revenue streams. However, scholars warn that without enforceable standards and independent oversight, such measures risk becoming superficial exercises in reputational management rather than substantive safeguards.

The cumulative effect of these dynamics is a profound reconfiguration of the journalistic field. AI is not merely a technological add-on to existing workflows; it is an agent of structural change that reshapes professional norms, business models, and the epistemological foundations of journalism itself. While its adoption can enhance efficiency, broaden investigative capacities, and enable new forms of storytelling, it also challenges the values of transparency, independence, and public accountability upon which journalism's democratic role depends.

The stakes of AI's integration into journalism are therefore high,

both for the profession and for society. If implemented responsibly, AI could augment human creativity, improve accessibility, and facilitate the production of high-quality news. If deployed without adequate safeguards, however, it risks undermining public trust, exacerbating economic vulnerabilities, and distorting the flow of information in ways that are difficult to reverse. Understanding these dual potentials—and the conditions under which one trajectory might prevail over the other—requires systematic, evidence-based examination, making it a pressing subject for scholarly inquiry.

This paper conducts a systematic review of the academic literature addressing the use of artificial intelligence in journalism. By integrating findings from varied methodological frameworks, regional contexts, and thematic areas, it aims to offer a comprehensive and critically grounded assessment of AI's technical capacities, ethical ramifications, economic impacts, and broader societal effects within the contemporary news environment. The review intends not only to trace dominant patterns and recurrent challenges but also to illuminate insufficiently examined dimensions—such as cross-cultural variation in adoption, the long-term consequences for democratic discourse, and the shifting nature of human editorial oversight. In doing so, it provides an evidence-based foundation to guide policy development, inform newsroom decision-making, and shape future scholarly inquiry. Given AI's expanding role in shaping news production, distribution, and consumption, such a synthesis is both timely and crucial for sustaining journalism's democratic responsibilities in the digital era.

2. Methodology

This study adopts a systematic review approach to examine the scholarly literature on the integration of AI into journalism, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure methodological rigor, transparency, and reproducibility (see for example, Rodrigues & Bertanha, 2025; Baba et al., 2024; Spicer et al., 2025; Rodríguez-Martínez et al., 2024). A comprehensive search strategy was implemented across several scholarly databases—among them Scopus, Web of Science, Google Scholar, IEEE Xplore, and selected publisher repositories—covering publications from January 2010 through March 2025. The search employed Boolean operators in combination with pertinent keywords, including "artificial intelligence", "machine learning", "automated journalism", "algorithmic journalism", and "generative AI". Studies were included if they examined AI-related applications, impacts, or perceptions within journalism, were written in English, and were published in peer-reviewed journals, academic monographs, or conference proceedings. Non-scholarly sources, studies unrelated to journalism, and works lacking substantive discussion of AI's role in news production were excluded.

All retrieved records were imported into a reference management system for duplicate removal, followed by a two-stage screening process comprising title and abstract review, then full-text assessment against the inclusion criteria. Data from the final set of studies were extracted using a structured template capturing bibliographic details, methodological approaches, geographical focus, AI technologies discussed, affected journalistic functions, and key findings. The synthesis employed a narrative approach, integrating empirical, conceptual, and theoretical contributions to identify thematic patterns such as automation, personalization, ethics, audience trust, and economic impacts. This methodological design was selected to accommodate the interdisciplinary nature of AI–journalism research, enabling a comprehensive and critically informed synthesis that reflects both the diversity of scholarly perspectives and the complexity of the topic.

3. Findings

Latar and Nordfors (2011) explored the potential impact of AI and digital identities on the future of journalism, emphasizing the opportunities and ethical challenges posed by their convergence. The authors outlined how AI methods—such as content-based image retrieval, video information retrieval, and human-centered content analysis—can be used to establish the "DNA" of journalistic content. The authors contended that aligning such content with user-specific digital identities facilitates sophisticated behavioral targeting, thereby increasing audience engagement with news. They introduced the idea of a journalistic behavioral-targeting engine as a potential mechanism through which AI could tailor content delivery on the basis of socio-genetic profiling and patterns of online behavior. The paper further explored the function of digital identities within social networks, the dangers associated with practices such as "weblining" (the discriminatory profiling of individuals using online data), and the corresponding implications for editorial autonomy and public trust.

Central to the analysis was the tension between these technological capabilities and long-standing journalistic norms, including accuracy, fairness, and the safeguarding of sources. The authors advocated the creation of a universal framework for the governance of digital identities, coupled with explicit ethical standards for the deployment of AI in journalistic contexts. They also called for a multi-stakeholder conversation to anticipate the societal ramifications of AI-driven personalization, ensuring that innovation reinforces rather than diminishes journalism's democratic function.

Broussard et al. (2019) explored the multifaceted concept of AI and its implications for journalism, positioning the discussion within the broader transformation of media in the digital age. The authors noted that AI, like the term "big data" before it, is often applied ambiguously

by both proponents and critics, complicating efforts to clearly define it. They clarified that, rather than sentient machines as often depicted in popular culture, AI more precisely refers to a branch of computer science concerned with simulating human intelligence, with recent emphasis on machine learning—training systems to learn from data, recognize patterns, and make decisions with minimal human input. The article paid particular attention to "communicative AI", encompassing technologies such as conversational agents, social robots, and automated writing systems, which function as communicators rather than intermediaries. This framing was used to contextualize AI's potential and challenges for journalism, including changes to work routines, content production, and audience engagement, as well as ethical and societal concerns such as bias, representation, and the impact on marginalized communities. By situating AI developments within the larger shifts toward algorithmic and platform-based media ecosystems, the forum highlighted AI as both a continuation of and a catalyst for journalism's ongoing reconfiguration in relation to computational technologies.

Kim (2019) examined the ethical use of AI in journalism, analyzing its application across the news production process—from story discovery to production and distribution. The thesis highlighted how newsrooms employ machine learning to process large datasets and detect patterns beyond human capability, as well as to automate data-driven stories such as earnings reports and sports recaps through pre-designed templates. AI was also noted as a tool for personalizing content recommendations to readers, thereby enhancing audience engagement. While these technologies offer efficiency gains and free journalists to focus on in-depth reporting, Kim emphasized that AI's integration into journalism raises significant ethical concerns. Through interviews with 12 professionals in journalism, technology, and law, the study identified key issues including algorithmic bias, lack of transparency, legislative gaps, and unclear attribution for AI-generated work. Based on these findings, Kim developed an ethical framework for newsroom AI adoption, advocating for transparency in algorithmic processes, accountability measures, clear attribution standards, and proactive legislative engagement. The framework aimed to guide media organizations in leveraging AI responsibly while upholding the profession's core values of accuracy, fairness, and trust.

Goni and Tabassum (2020) investigated the readiness of future journalists in Bangladesh to adapt to AI in the newsroom, situating the study within the broader global trend toward AI-driven journalism. Recognizing that AI constitutes the "fourth wave" of journalism—following online, mobile, and social media transformations—the authors emphasized that while major news organizations in developed countries, such as *The New York Times* and *The Washington Post*, have already integrated automated reporting tools, Bangladesh remains in the

early stages of adoption. The study employed a survey of undergraduate journalism students from multiple universities to assess awareness, preparedness, and perceptions of AI's role in the profession. Findings suggested that while students were aware of AI's growing influence, their practical readiness to work in AI-enabled news environments was limited, with significant gaps in technical skills, access to resources, and institutional training. The authors projected that Bangladesh may experience widespread AI integration in journalism within three to four years, provided that media practitioners, educators, and policymakers proactively prepare through curriculum updates, skills development programs, and infrastructure investment. They concluded that aligning journalism education with technological advancements is essential to ensure that the next generation of Bangladeshi journalists can thrive in an AI-driven media landscape.

Biswal and Gouda (2020) examined the global implications of AI in journalism, situating the discussion within the broader context of rapid advances in information and communication technologies (ICTs). The chapter highlighted how machine learning and AI—through innovations such as robot reporters and automated journalism—are reshaping news production, distribution, and consumption. The authors traced the technological evolution of the news industry, noting that digital media has dramatically accelerated the dissemination of information and fostered widespread adoption of new tools throughout the journalistic process. AI's role was analyzed as both a transformative force enabling efficiency, speed, and scalability, and as a disruptive factor raising concerns about accuracy, ethics, and the potential erosion of human editorial oversight. By assessing examples of AI integration across different countries, the chapter underscored that the effects are uneven, influenced by regional technological infrastructure, market readiness, and policy environments. The authors framed the debate over whether AI represents a boon or a bane for journalism as dependent on how effectively stakeholders manage the balance between innovation and journalistic integrity. They concluded that while AI offers powerful opportunities to enhance content creation and distribution, its responsible adoption requires careful ethical consideration, transparent processes, and continued human involvement in editorial decision-making.

Ogbebor and Carter (2021) introduced a special issue of Digital Journalism that compiled selected papers from the seventh biennial Future of Journalism (FOJ) conference, held at Cardiff University's School of Journalism, Media and Culture in September 2019. The conference theme, "Innovations, Transitions and Transformations", framed the discussions and research contributions, which examined how journalism is evolving in response to rapid technological changes and the associated social, political, and cultural shifts. The editors highlighted that the collected works addressed both the practical

dimensions of change—such as the integration of new tools, platforms, and production processes—and the theoretical need for fresh conceptual and methodological frameworks to analyze these transformations. The issue encompassed a diverse range of perspectives within digital journalism studies, reflecting contemporary debates over automation, algorithms, symbolic representations in news, and the broader implications of emerging media forms. Ogbebor and Carter positioned the collection as a significant contribution to ongoing scholarly discourse on how journalism adapts within increasingly digital, data-driven, and networked environments, underscoring the field's need to continuously reassess both practice and theory in light of ongoing innovation.

Almalki et al. (2022) proposed an AI-driven drone framework to enhance "aerial journalism", aiming to improve the timeliness, efficiency, and sustainability of media coverage. The study focused on integrating unmanned aerial vehicles (UAVs) with artificial intelligence through a neural network—specifically the NN-RBFN (Radial Basis Function Network) approach—to optimize wireless channel propagation models for transmitting high-quality media content. This system was designed to support a range of journalistic activities, including investigative reporting in humanitarian crises, capturing live footage of man-made or natural disasters, and providing livestream coverage of large-scale events such as the Olympic Games. Using MATLAB and 3D Remcom Wireless Insite simulation tools, the authors modeled a 3D propagation environment and demonstrated that their NN-RBFN approach achieved a channel modeling accuracy rate of 99%. The framework offered advantages such as higher data transmission rates, wider coverage areas, and reliable connectivity in both routine and challenging scenarios, including remote or hard-to-reach locations. The authors argued that combining drones with AI could create a more sustainable, cost-effective, and eco-efficient model for digital journalism, enabling rapid and reliable dissemination of visual news content while expanding the operational capabilities of newsrooms.

Moran and Shaikh (2022) analyzed meta-journalistic discourse surrounding the adoption of AI in journalism, focusing on how news media themselves have represented the technology's uses, roles, and potential consequences. The study examined 95 articles published between 2016 and 2020 across 20 U.S. and U.K. news outlets, selected to reflect variation in media type and partisan orientation. Using thematic analysis, the authors identified recurring narratives that revealed both optimism and apprehension toward AI in the newsroom. Coverage often highlighted AI's capacity to enhance efficiency, automate routine reporting, and support data-driven storytelling, while simultaneously cautioning against risks such as diminished editorial judgment, over-reliance on automation, and threats to journalistic

integrity. The findings underscored a broader tension between journalism as an industry—interested in economic efficiency and innovation—and journalism as a profession—grounded in normative ideals of accuracy, independence, and public service. The discourse also reflected awareness of the economic and contextual complexities of news production in the digital era, where AI adoption must be balanced against ethical considerations and audience trust. The authors concluded that the way journalists discuss AI internally and publicly is shaping not only industry practices but also public perceptions of AI's legitimacy and desirability in news production.

Aissani et al. (2023) examined the adoption of AI tools in the media and journalism industry, focusing on their roles in writing, editing, production, and distribution, as well as the associated professional concerns. Using a descriptive-analytical approach, the authors found that AI tools are now firmly embedded in newsroom operations, supporting tasks such as automated content creation, language processing, and production workflows. The study also documented the diverse ways these technologies are applied across different stages of news work, enhancing speed, efficiency, and scalability. Interviews with media scholars and industry practitioners, however, indicated ongoing reservations about the adoption of these technologies. Prominent concerns encompassed the spread of deepfake material, the exacerbation of existing news biases, potential workforce displacement within journalism, inadequate transparency surrounding algorithmic operations, and wider ethical issues tied to accountability and public trust. The authors concluded that while AI tools offer substantial opportunities for operational efficiency and innovative content delivery, their integration must be accompanied by clear ethical guidelines, robust oversight mechanisms, and industry-wide commitments to transparency in order to safeguard journalistic integrity.

Opdahl et al. (2023) presented a vision paper on leveraging AI and machine learning (ML) to strengthen the production of high-quality, trustworthy journalism. The authors framed their discussion within the dual challenge facing news organizations: the increasing societal need for reliable information to counter disinformation and the economic pressures from declining revenues and competition from alternative media sources. They argued that AI techniques can be integrated into every stage of the news production cycle—from information gathering and verification to content creation, distribution, and audience engagement—to enhance trustworthiness. Potential applications included automated fact-checking, source validation, bias detection, and audience-tailored content delivery that maintains editorial integrity. Emphasis was placed on ensuring that AI deployment in journalism prioritizes transparency, accountability, and ethical safeguards to avoid undermining public confidence. The authors concluded that AI, if

responsibly implemented, could help newsrooms operate more efficiently while reinforcing the trust relationship between journalists and their audiences, positioning technology as an enabler of both quality and credibility in the digital news ecosystem.

Arguedas and Simon (2023) examined the democratic implications of generative AI in journalism through the lens of a multidisciplinary symposium convened by the Balliol Interdisciplinary Institute at the University of Oxford. Prompted by the rapid public adoption of ChatGPT and other large language models (LLMs) since late 2022, the authors framed the discussion around the transformative potential and risks of AI systems capable of producing human-like text, images, and other media. The symposium brought together academics, journalists, technologists, and ethicists to address three thematic areas: the technology, context, and socioeconomics of LLMs; the impact of generative AI on news media; and approaches to democratic and global regulation. Central questions included how automated content creation might alter public deliberation, journalistic autonomy, and citizen engagement, as well as what safeguards are necessary to uphold democratic values such as transparency, accountability, and self-governance in AI-mediated media ecosystems. Speakers identified both opportunities—such as enhancing information accessibility and supporting newsroom efficiency—and challenges, including misinformation risks, diminished human editorial control, and concentration of power among technology companies. The report concluded by summarizing emerging concerns, highlighting unresolved questions, and calling for sustained interdisciplinary dialogue and research to ensure that generative AI is leveraged in ways that strengthen rather than erode democratic processes.

Pinto and Barbosa (2024) examined the historical application and typology of AI systems within Brazilian journalistic products, aiming to map their uses, identify innovative processes, and analyze AI-based projects for journalism. Anchored in a critical literature review, the study involved a systematic search of web repositories—Google, Google Scholar, and Scopus—using targeted Portuguese-language terms related to AI and journalism, including “inteligência artificial”, “bot”, “natural language generation”, “machine learning”, and “algoritmos”. The resulting corpus comprised documented cases illustrating AI’s role in the production and distribution of news in Brazil’s digital journalism sector. The analysis considered factors such as database integration, platform collaborations, code-sharing practices, interoperability with other AI systems, funding mechanisms, and whether the initiatives functioned within backend infrastructures or frontend newsroom processes. In a related line of inquiry, the authors examined the extent to which Brazilian news organizations were formally adopting generative AI tools, with particular attention to ChatGPT. The results showed that adoption remained limited to low-

cost, low-impact applications, with bots constituting the most prevalent technology. The availability of these tools in public repositories was identified as a crucial facilitator, enabling native digital outlets to implement incremental innovations even under conditions of constrained resources. Overall, the study concluded that Brazilian journalism has shown adaptive experimentation with AI, yet its integration remains limited in scope and technological sophistication, reflecting structural and economic barriers to large-scale deployment.

Theodosiou et al. (2024) examined the potential, challenges, and future directions of integrating AI generative tools into digital journalism, with a particular focus on visual journalism. The paper contextualized recent advancements in AI—especially deep learning and computer vision—that enable the automatic creation of personalized and real-time journalistic content, including highly aesthetic visual materials. Drawing on a review of current literature and technological developments, the authors discussed how AI tools can assist journalists by streamlining workflows, enhancing content personalization, and reducing operational costs for news organizations. At the same time, they critically addressed significant challenges related to ethics, legality, and quality assurance, including issues of bias, authenticity, misinformation risks, and intellectual property rights. The study highlighted both advantages—such as efficiency gains, creative enhancement, and improved audience engagement—and disadvantages, including overreliance on automated processes, potential loss of journalistic integrity, and reduced transparency in content production. In exploring visual journalism, the authors emphasized the transformative potential of AI in generating compelling imagery, but cautioned that without robust editorial oversight and regulatory frameworks, such technologies could undermine trust in journalism.

Forja-Pena et al. (2024a) examined the ethical challenges posed by the integration of AI into digital journalism, focusing on its implications for both media professionals and audiences. Recognizing that AI tools have become commonplace in editorial departments, the authors framed this shift as irreversible and in need of updated ethical frameworks to safeguard journalistic integrity. The study integrated a content analysis of 99 ethical codes and 14 international press associations with a large-scale audience survey of nearly 2,000 participants. The results demonstrated a shared apprehension among both journalists and the public regarding AI's potential to intensify misinformation, deepen political polarization, and further weaken trust in news. Respondents voiced doubts about the unregulated use of AI in news production, stressing that ethical standards, transparency, and accountability must govern its deployment. The analysis also highlighted a broad demand for external regulatory frameworks to ensure that AI practices remain consistent with journalistic norms and

professional integrity, rather than relying solely on self-governance by media organizations. The authors concluded that the accelerating integration of AI into digital journalism necessitates not only technical oversight but also a cultural and ethical reorientation aimed at preserving credibility and sustaining public trust in an increasingly automated news ecosystem.

Forja-Pena et al. (2024b) explored the evolving challenges faced by digital journalism in the context of the accelerating digital transformation and the growing influence of AI. Framing the current period as part of the Fourth Industrial Revolution, the authors argued for the need to develop a more resilient and people-centred journalism capable of adapting to technological change while preserving its core values. The study employed a dual-method approach: a content analysis of 45 European journalistic codes of ethics and the Delphi method, engaging experts from both professional journalism and academia. Findings revealed a disconnect between ongoing professional and academic debates about AI's implications and the content of existing ethical codes, which rarely address emerging technologies explicitly. Instead, the codes tended to prioritize issues such as disinformation and social engagement over the direct ethical considerations posed by AI adoption in news production. Expert participants stressed the urgency of updating ethical frameworks to account for automation, algorithmic decision-making, and AI-assisted content creation, emphasizing the importance of safeguarding factual accuracy and public trust.

Moravec et al. (2024) investigated public perceptions of AI in journalism, focusing on the ability to distinguish between AI- and human-generated news content, as well as attitudes toward AI's role in the industry. The study surveyed 1,041 respondents in the Czech Republic, examining demographic factors—including gender, age, education, and socioeconomic status—in relation to AI literacy. Results indicated that females were more adept at identifying human-authored texts, while males performed better at recognizing AI-generated texts. Younger participants generally demonstrated greater accuracy in detecting AI-generated content, and higher education and income levels correlated with improved recognition skills. Attitudes toward AI in journalism varied by age group: respondents aged 18–29 showed ambivalence, those 30–49 expressed uncertainty, the 50–69 cohort exhibited mixed views, and individuals aged 70+ were predominantly skeptical. Males, particularly in older demographics, were more optimistic about AI's potential in journalism than females. The study also assessed perceptions of AI-generated audio content, finding similar demographic patterns in evaluative responses. The authors concluded that targeted, demographic-specific AI literacy initiatives are essential to prepare the public for an AI-driven media environment, emphasizing that such interventions will be critical to addressing the socio-economic

and ethical challenges accompanying future technological developments in journalism.

Amponsah and Atianashie (2024) provided a comprehensive review of the integration of AI into journalism, mapping its progression from early computer-assisted reporting to sophisticated contemporary applications. The article examined AI's transformative influence on efficiency, personalization, and data-driven reporting, alongside its more contentious implications, including job displacement, misinformation risks, and complex ethical challenges. Drawing on multiple case studies, the authors analyzed real-world examples of AI adoption in newsrooms, such as automated content generation and AI-assisted editorial decision-making, highlighting both operational benefits and instances of public controversy. Ethical considerations formed a central focus, with discussion on transparency, accountability, and bias in AI systems, and the urgent need for industry-wide ethical standards. The paper stressed that while AI can streamline newsroom workflows and enhance audience engagement, its deployment must be balanced by sustained human editorial oversight to safeguard journalistic integrity. Looking ahead, the authors envisioned continued technological advancements but maintained that human journalists will remain essential for contextual analysis, ethical judgment, and maintaining trust. They concluded that responsible AI adoption requires collaboration between technologists, journalists, and policymakers to ensure that innovation aligns with professional values.

Khattak et al. (2025) examined the effects of the AI revolution on digital journalism in Pakistan, identifying both emerging opportunities and significant challenges. Drawing on Marshall McLuhan's Technological Determinism Theory, the study employed a deductive, cross-sectional, quantitative design. The research population consisted of journalism students from multiple Pakistani cities, and a sample of 350 participants was obtained through convenience sampling. Data were gathered using a Likert-scale questionnaire and analyzed through descriptive statistics to summarize demographic characteristics and thematic patterns. The findings showed that AI has markedly influenced journalism by enabling automation, strengthening content production, expanding accessibility, and transforming newsroom practices. Participants regarded AI as a driver of efficiency and innovation, capable of delivering context-specific solutions to a range of journalistic tasks. Nonetheless, the study also identified major concerns, including workforce displacement, privacy infringements, ethical challenges, the spread of deepfakes, legal ambiguities, unauthorized data extraction, and limited public awareness of AI's implications.

Sonni (2025) conducted a mini-review of the digital transformation in journalism from 2014 to 2024, with a focus on the adoption of AI technologies, shifts in business models, and evolving professional

practices. Drawing on an analysis of recent literature, the review identified three primary research streams: the integration of technology in newsrooms, changes in content consumption patterns, and innovations in business models. The findings indicated that AI has significantly reshaped news production and distribution processes, enhancing efficiency and personalization but also introducing notable ethical and professional challenges. Key concerns included the potential erosion of editorial standards, the risk of bias in algorithmically generated content, and the implications for journalistic autonomy. The review highlighted substantial gaps in the literature, particularly regarding the long-term effects of AI on journalistic practice, the lack of cross-cultural analyses of digital adoption, and the nascent exploration of immersive journalism's impact. Sonni recommended future research to address the ethics of automated journalism, the development of sustainable digital business models, and strategies for optimizing content across multiple platforms. Overall, the review positioned AI as both a catalyst for innovation and a source of complex challenges requiring careful scholarly and industry attention.

Kevin-Alerechi et al. (2025) investigated the transformative role of AI and machine learning (ML) in newsroom operations, analyzing their implications across data collection, fact-checking, reporting, editing, and content dissemination. The study highlighted the capacity of AI-powered tools—leveraging natural language processing, machine learning algorithms, and cloud-based systems—to enhance journalistic productivity and narrative quality. Key applications identified included automated research tools, speech-to-text conversion, real-time language translation, instant news notifications, and rapid source authentication. Such tools streamline data aggregation and synthesis, enabling journalists to prioritize investigative depth and critical analysis, while automated storytelling and summarization expand the efficiency and reach of news dissemination. The authors underscored AI's potential to support personalized content delivery and audience engagement, particularly through multimodal systems that integrate text, images, audio, and video for richer storytelling. However, they cautioned that algorithmic bias, misinformation risks, and weakened editorial oversight pose significant challenges, necessitating strong accountability mechanisms, bias detection protocols, and sustained human oversight. The adoption of explainable AI (XAI) was emphasized as critical for fostering trust among journalists and audiences. The paper concluded that AI can be a powerful enabler of inclusive, impactful journalism if technological innovation is balanced with rigorous ethical governance, ensuring that core values of truth, integrity, and critical inquiry are preserved in the evolving digital media environment.

Kazmi and Ali (2025) examined Pakistani journalists' perspectives on the integration of AI in journalism, focusing on its perceived

benefits, ethical implications, and challenges. Adopting a qualitative research design, the study utilized semi-structured interviews with journalists from Karachi, Lahore, and Islamabad, capturing viewpoints across both digital and traditional media sectors. Findings revealed notable differences in AI familiarity, with digital media professionals demonstrating greater awareness and use of AI tools compared to their traditional media counterparts. Participants recognized AI's potential to improve efficiency and accuracy, particularly in automating repetitive tasks, streamlining workflows, and enhancing audience engagement. Nonetheless, significant concerns emerged around misinformation, data privacy, job displacement, and transparency. Ethical issues—such as algorithmic bias and unclear accountability for AI-generated content—were also emphasized. While apprehensions persisted, many journalists expressed optimism toward AI's future role, conditional on the provision of adequate training and institutional support. The authors concluded that the responsible adoption of AI in Pakistani journalism requires the development of clear ethical guidelines, targeted capacity-building initiatives, and stronger collaboration between media organizations and the technology sector to balance innovation with professional standards.

Cheng (2025) investigated the relationship between AI and journalism, evaluating whether the technology presents more significant risks or opportunities for the field. The article opened by outlining journalism's historical development and situating the extensive transformations introduced by the contemporary AI revolution. Drawing on both sociological and technological perspectives, Cheng considered how AI—especially large language models (LLMs)—might be adapted to support journalism's core principles. The study incorporated experiments involving AI model-customization methods, including embedding techniques and Constitutional AI, to enhance the alignment of a general-purpose LLM with journalistic norms. These strategies were assessed for their capacity to address persistent industry challenges, particularly misinformation and declining public trust. Cheng contended that properly calibrated AI systems could help reduce these problems by improving the accuracy, reliability, and ethical consistency of news content, as long as human oversight remains integral to the process. The paper concluded that although AI entails substantial risks—most notably regarding bias, transparency, and editorial responsibility—it also offers considerable potential to reinforce journalism's democratic function when deployed with robust ethical safeguards and technical precision.

4. Conclusion

Artificial intelligence has significantly restructured work processes and organizational procedures across a broad range of industries. By

automating routine and repetitive tasks, AI systems have enhanced operational efficiency, reduced human error, and enabled real-time data-driven decision-making (Habib Zadeh Khiyaban & Sabbar, 2022). In sectors such as manufacturing, healthcare, finance, and logistics, AI technologies streamline workflows through predictive analytics, intelligent process automation, and adaptive resource allocation. Human roles are increasingly shifting from manual execution to supervisory, interpretive, and strategic functions, demanding new skill sets centered on digital literacy and system oversight. Moreover, AI-driven optimization has redefined performance metrics, supply chain coordination, and customer service protocols, fostering greater scalability and responsiveness.

This review has illustrated that artificial intelligence is not merely a technological adjunct to journalism but a transformative force with far-reaching implications for how news is produced, distributed, and consumed. The evidence indicates that AI is actively reshaping core journalistic functions—from automated reporting and data-driven investigation to audience engagement and workflow optimization. Yet, the integration of AI also destabilizes long-standing epistemic and ethical foundations of journalism, challenging its professional autonomy, transparency, and democratic accountability.

Crucially, the findings reveal that the impact of AI on journalism is not monolithic; rather, it unfolds unevenly across geographic, institutional, and technological contexts. Variations in infrastructure, policy environments, and newsroom culture condition how AI is adopted and to what effect. This suggests that universal prescriptions are insufficient: the governance of AI in journalism must be locally attuned, culturally sensitive, and inclusive of diverse stakeholder voices. Without such contextualization, global inequalities in media development may be exacerbated, entrenching informational divides and reinforcing digital asymmetries.

Looking ahead, three predictive trajectories emerge. First, AI is likely to accelerate the platformization of journalism, where content production and distribution become increasingly reliant on infrastructures controlled by a few dominant tech firms. This trend raises questions about sovereignty over journalistic content and the political economy of media in the algorithmic age. Second, the refinement of generative AI and large language models will continue to blur the boundaries between human and machine-authored content, necessitating new norms for attribution, editorial responsibility, and media literacy. Third, we can anticipate a normative recalibration of journalistic ethics, driven by both internal pressures for professional integrity and external demands for algorithmic accountability, transparency, and inclusivity.

To navigate these challenges, journalism must embrace a dual commitment: technological adaptability and ethical resilience. This

entails integrating AI not as a substitute for human judgment but as a complement to it—leveraging computational capacities while preserving human editorial oversight. It also requires that future research move beyond operational efficiencies and focus on the long-term epistemological, democratic, and cultural consequences of AI in journalism.

Conflict of interest

The authors declared no conflicts of interest.

Ethical considerations

The authors have completely considered ethical issues, including informed consent, plagiarism, data fabrication, misconduct, and/or falsification, double publication and/or redundancy, submission, etc. This article was not authored by artificial intelligence.

Data availability

The dataset generated and analyzed during the current study is available from the author on reasonable request.

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