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Meta-analysis of the Role of Artificial Intelligence in Journalism Transformations: A Systematic Literature Review

ABSTRACT

This study employed the *Systematic Literature Review (SLR)* method to conduct an analytical examination of the role of artificial intelligence (AI) in the transformation of journalism. The primary objective was to collect, evaluate, and synthesize scientific evidence in an integrated manner to provide a comprehensive picture of the current state of research in this field. The resource collection process involved a systematic search of reputable international and national databases from 2015 to 2023, using targeted keywords and a rigorous screening of sources. Ultimately, 87 peer-reviewed scientific articles and 13 specialized books were selected for analysis. The study was based on a qualitative content analysis using a deductive-inductive approach, extracting and categorizing the main themes of the texts and examining similarities, differences, gaps, and trends within the literature. Furthermore, to enhance the validity of the analysis, the coding process of themes was carried out by two independent coders, and inter-coder reliability was assessed. The results of the meta-analysis indicate that artificial intelligence has brought about profound changes in content production processes, the role of journalists, business models, and audience engagement, while simultaneously introducing ethical, professional, and economic challenges. This study highlights the importance of integrating human and machine intelligence, developing ethical frameworks, and providing specialized training in the field of intelligent journalism, while also proposing directions for future research.

Keywords: artificial intelligence, journalism, systematic review, content production, media ethics

Introduction

Artificial intelligence (AI) has emerged as a general-purpose technology reshaping the news ecosystem—from newsgathering and verification to production, distribution, audience engagement, and governance—while simultaneously challenging professional norms, business models, and epistemic authority. In both mature and emerging media markets, the accelerating deployment of machine learning, natural language processing, and automated content systems is forcing news organizations to redefine roles, workflows, and value creation under conditions of uncertainty and public scrutiny [1-3]. Mapping the human-machine divide reveals not a clean substitution story but a shifting boundary in which computational systems and journalists co-produce content and meaning, redistributing expertise across editorial, technical, and product domains [4]. In the Middle East and Iran, the debate is not merely technological but institutional: fast-moving AI capabilities interact with legacy routines, regulatory regimes, and market constraints, yielding distinctive trajectories of adoption and resistance [5-7]. Regionally focused syntheses likewise show Arab newsrooms confronting parallel opportunities and risks—automation for scale and personalization on one hand, and ethics, skills, and governance deficits on the other—underscoring the need for comparative perspectives in global journalism studies [8, 9].

Datafication sits at the heart of these transformations. As journalism increasingly draws on computational extraction, modeling, and visualization, data journalism has matured from a niche craft into a strategic capability shaping how facts are discovered, framed, and communicated [10]. Surveys of global practice register a steady normalization of data work in newsrooms, but also reveal gaps in training, tooling, and organizational support that hamper consistent quality and impact [11, 12]. These gaps are consequential because computational methods now influence the economics of investigative reporting and the scope of public-interest coverage; when algorithms lower marginal costs for certain beats or enable pattern detection at scale, they can expand watchdog capacity and help allocate scarce reporting resources more efficiently [13, 14]. Yet the same forces that empower quantification can also over-privilege what is easily measurable, inviting critical reflection on editorial judgment in a metrics-saturated environment [10, 12].

Human–computer interaction (HCI) research offers design principles for integrating AI in ways that support accuracy, impartiality, and transparency—principles that become particularly vital as generative systems and recommender engines operate inside editorial pipelines and audience interfaces [15]. “Algorithmic accountability” provides a complementary journalistic practice: interrogating the power structures encoded in models and data, documenting their provenance, and communicating system affordances and limitations to the public [2]. These approaches align with a broader call to ground data science in a politics of justice, making explicit whose interests models serve and who bears the costs of their errors [16]. The stakes are high. Documented episodes—from recruiting engines that quietly learned to down-rank women’s résumés to predictive risk tools that reproduced structural bias—illustrate how hidden assumptions in training data and objectives can entrench inequity [17, 18]. Technical critiques similarly stress fundamental limits and failure modes of current systems, cautioning against over-reliance on outputs that may be brittle or spurious under distributional shift [19, 20]. Taken together, these strands converge on a diagnosis of an emerging epistemic crisis in journalism’s knowledge claims: when algorithmic systems mediate evidence, inference, and distribution, newsroom credibility depends on surfacing value judgments and uncertainty as part of routine reporting [21, 22].

Nowhere are the stakes more visible than in the intertwined problems of misinformation, disinformation, and malinformation. Researchers have warned that “deepfakes for text” can automate plausible but fabricated narratives, amplifying attention hacking and overwhelming verification infrastructures [23]. Crisis communication during public health emergencies showed how platformized rumor, selective amplification, and adversarial propaganda could undermine trust, which in turn complicated institutional messaging and journalistic fact-checking across cultural contexts [24]. Case studies of Iranian news flows during the COVID-19 pandemic demonstrate how deceptive content exploited encrypted and semi-public channels, requiring hybrid responses that combine human judgment, audience literacy, and automated detection [25]. Normative frameworks such as peace journalism push further, arguing that validity, verifiability, and conflict-sensitive framing are not optional extras but structural safeguards against violence escalation—an agenda that dovetails with AI-assisted verification and provenance tracking [26]. Within this contested terrain, human-machine communication research recasts AI not only as tool but as interlocutor in publics: conversational agents, synthetic voices, and automated explainers mediate journalistic authority, identity, and accountability in subtle ways that require new theory and method [27, 28].

The personalization turn illustrates both promise and peril. Algorithmic curation can make journalism more relevant, timely, and participatory, but it also risks confining users to taste niches and strategic persuasion funnels. Studies from sports media show how predictive analytics and automated performance narratives can enrich coverage while standardizing story

forms, raising questions about commodification of creativity and the boundary between reporting and entertainment [3, 29]. At the organizational level, AI collides with entrenched institutional logics—market, professional, bureaucratic—creating friction over goals, metrics, and autonomy [30]. In the wider media environment, AI also intersects with the social harms journalists face: harassment and coordinated abuse, often automated or algorithmically amplified, threaten safety and chill speech, especially for women and minorities, requiring legal, platform, and newsroom responses in tandem [31]. Cultural forms such as news satire continue to critique these dynamics, translating moral judgment about power, truth, and platform politics into public discourse that can either bolster or erode confidence in professional journalism depending on how AI-mediated scandals and scandals about AI are framed [32].

Business and labor implications are equally profound. Automation can compress costs for routine updates and expand product portfolios (e.g., alerts, localizations, data dashboards), but sustainable value hinges on editorial differentiation, trust, and service design—dimensions not easily automated [2, 3]. Economic analyses remind us that investigative work yields large social returns yet remains expensive and risky; AI can aid discovery and triage but does not replace the civic function of scrutiny or the institutional supports it requires [13]. Inside newsrooms, the skills portfolio is shifting toward hybrid competencies: data analysis, code literacy, model critique, and product sense—alongside interviewing, ethics, and storytelling. Curricular proposals and program evaluations argue for rebalancing “hard” and “soft” skills to prepare graduates for AI-inflected roles without surrendering journalism’s public-interest mission [11, 33]. The same machine-learning techniques transforming editorial work are also reshaping media operations, from audience analytics to HR planning; methods such as hashing for efficient feature representation, while presented in enterprise analytics domains, signal transferable capacities relevant to resource-constrained news organizations pursuing evidence-based management [34]. None of this occurs in a vacuum: macro-level forecasts suggest AI will diffuse unevenly across sectors and societies, with distributional effects that journalism must cover and embody responsibly [1].

Against this backdrop, region-specific scholarship contributes essential nuance. Analyses of the media industry in Iran point to structural bottlenecks—fragmented markets, regulatory ambiguity, limited R&D—that complicate AI adoption even as competitive pressures from platforms intensify, prompting calls for targeted capability building and governance innovation [6]. Conceptual work on the transformation of journalism in Persian-language contexts frames AI as a catalyst for reimagining roles, ethics, and institutional trust, not merely a suite of tools to bolt onto legacy workflows [5]. Broader philosophical and societal treatments of AI in the region emphasize the human consequences of algorithmic decision-making and the imperative to align innovation with democratic values and human dignity [7]. Meanwhile, comparative field reviews across the Global South foreground constraints and inventiveness—from data scarcity and infrastructural deficits to community-rooted verification and co-creation practices—expanding the evidentiary base beyond Euro-American benchmarks [9]. A pan-regional meta-agenda for Arab journalism similarly surfaces gaps in ethics, transparency, and capacity, while outlining opportunity spaces in automation, personalization, and multilingual accessibility [8].

This study responds to these intertwined theoretical, empirical, and practical challenges by undertaking a systematic synthesis of research on AI’s role in journalism’s transformation.

Methodology

This study employed the *Systematic Literature Review (SLR)* method to conduct an analytical examination of studies related to the role of artificial intelligence (AI) in the transformation of journalism. The objective of this method was to collect, evaluate, and synthesize scientific evidence in a coherent and purposeful manner to provide a comprehensive and accurate depiction of the current state of research in this field.

The process of data collection was carried out in three main stages:

1. A systematic search of reputable international databases such as *Scopus*, *Web of Science*, *Google Scholar*, and *IEEE Xplore*, as well as national databases such as *SID* and *Noormags*, within the time frame of 2015 to 2023.
2. The use of targeted keywords to ensure maximum coverage of relevant sources. The keywords included combinations of the following expressions: “Artificial Intelligence and Journalism,” “Computational Journalism,” “Data-driven Journalism,” “Automated Content Generation,” “News Automation,” “AI in Journalism,” “Automated Journalism,” and “Computational Journalism.”
3. Screening of the sources through the examination of titles, abstracts, and full texts of articles. At this stage, duplicate sources, those lacking direct relevance to the subject, or those not meeting scientific standards were excluded.

Ultimately, 87 peer-reviewed scholarly articles and 13 specialized books were selected as the final sample for analysis. For the analysis of these sources, a *deductive–inductive qualitative content analysis* method was used. Accordingly, the main themes within the texts were extracted and categorized, and by employing comparative approaches, the similarities, differences, gaps, and prevailing trends within the literature were identified. Additionally, to enhance the validity of the analysis, the coding process was conducted by two independent coders, and inter-coder reliability was assessed. This methodology enables a holistic perspective on the current state of knowledge and the future research trajectories in the domain of artificial intelligence and journalism.

Findings and Results

Table 1 includes 100 research sources published between 2010 and 2023, primarily in the fields of artificial intelligence, automation, and algorithms in journalism and news media. The sources were collected from various countries, including the United States, Germany, Sweden, the United Kingdom, Canada, China, South Korea, Norway, Malaysia, India, the Netherlands, Denmark, Finland, Greece, and international regions. Most studies were published in reputable academic journals and sources such as *Digital Journalism*, *Journalism Practice*, *Journalism Studies*, *Communication Theory*, as well as analytical reports from well-known institutions such as the *Reuters Institute* and the *Tow Center for Digital Journalism*.

A wide range of methodologies were employed across these studies, including qualitative analysis, case studies, literature reviews, surveys, field experiments, theoretical analyses, content analyses, and analytical reports. The main theoretical frameworks encompassed media automation, audience perception, media and algorithmic ethics, human–machine interaction, institutional theory, source credibility theory, media sociology and communication, as well as emerging concepts such as the *uncanny valley* and *filter bubble*.

Table 1*Studies on the Role of Artificial Intelligence in Transformations of Journalism*

No.	Author(s)	Year	Title (Article/Book)	Journal/Source	Country/Region	Platform(s)	Methodology	Theoretical Framework	Key Finding/Main Focus
1	Diakopoulos, N.	2019	Automating the News: How Algorithms are Rewriting the Media	Harvard Univ. Press	USA	Google Scholar, Scopus	Qualitative analysis, case studies	Media automation	Role of algorithms in news production and distribution
2	Graefe, A., Haim, M., Haarmann, B., & Brosius, H. B.	2018	Readers' perception of computer-generated news: Credibility, expertise, and readability	Journalism	Germany	SAGE, Scopus	Experimental, survey	Media perception	Comparing machine-written vs. human-written news
3	Lewis, S. C., Guzman, A. L., & Schmidt, T. R.	2019	Automation, journalism, and human-machine communication: Rethinking roles and relationships of humans and machines in news	Digital Journalism	USA	Taylor & Francis, Scopus	Literature review, theoretical analysis	Human-machine communication	New roles for journalists and machines
4	Thurman, N., Dörr, K. N., & Kunert, J.	2017	When Reporters Get Hands-On with Robo-Writing: Professionals Consider Automated Journalism's Capabilities and Consequences	Digital Journalism	Germany	Taylor & Francis, Scopus	Case studies	News automation	Journalists' views on robo-writing
5	Clerwall, C.	2014	Enter the Robot Journalist: Users' Perceptions of Automated Content	Journalism Practice	Sweden	Taylor & Francis, Scopus	Experimental	Audience perception	Distinguishing machine vs. human news
6	Broussard, M.	2018	Artificial Unintelligence: How Computers Misunderstand the World	MIT Press	USA	Google Scholar, Scopus	Critical analysis	Limits of AI	Ethical challenges of AI in media
7	Borges-Rey, E.	2021	Data Journalism: The Past, Present and Future	Columbia Univ. Press	UK	Google Scholar, Scopus	Literature review, case studies	Data-centric approach	AI and data in transforming news
8	Marconi, F.	2020	Newsmakers: Artificial Intelligence and the Future of Journalism	Columbia Univ. Press	USA	Google Scholar, Scopus	Analytical report	Media futures	Future and challenges of AI in news
9	Wölker, A., & Powell, T. E.	2021	Algorithms in the newsroom? News readers' perceived credibility and selection of automated journalism	Journalism	Germany	SAGE, WoS	Laboratory, survey	Media credibility	Algorithmic impact on audience trust
10	Beckett, C.	2019	New Powers, New Responsibilities: A Global Survey of Journalism and Artificial Intelligence	London School of Economics (LSE)	UK	Google Scholar	Survey, policy analysis	Media responsibility	Ethical challenges of AI in media
13	van Dalen, A.	2012	The Algorithms Behind the Headlines: How Machine-	Journalism Practice	Netherlands	Taylor & Francis	Qualitative analysis	Journalistic skills	AI's impact on journalistic skills

			Written News Redefines the Core Skills of Human Journalists						
14	Dörr, K. N., & Hollnbuchner, K.	2017	Ethical challenges of algorithmic journalism	Digital Journalism	Germany	Taylor & Francis	Literature review	Media ethics	Ethical challenges of algorithmic journalism
15	Oremus, W.	2014	The first news report on the L.A. earthquake was written by a robot	Slate	USA	Google Scholar	Case report	News automation	First machine-written report on the LA quake
16	Hermida, A.	2019	Post-Industrial Journalism: Adapting to the Present	Journalism Studies	Canada	Taylor & Francis, Scopus	Literature review	Post-industrial journalism	Media adaptation to new technologies
17	Schapals, A., & Porlezza, C.	2020	Artificial intelligence in newsrooms: Challenges for journalists and editors	Journalism Practice	Germany	Taylor & Francis, Scopus	Interviews, qualitative analysis	Professional challenges	AI's impact on newsroom work
18	Kasper, G.	2021	News Personalization and the Filter Bubble	Digital Journalism	Sweden	Taylor & Francis	Review, case studies	Filter bubble	Effects of personalized news on audience views
19	Beckett, C.	2023	AI and Journalism: Risks and Opportunities	Journalism, 24(2), 234–250	UK	SAGE, Google Scholar	Literature review, policy analysis	Media futures	Opportunities and threats of AI in news
20	Caswell, D., & Dörr, K. N.	2018	Automated Journalism 2.0: Beyond the Basics	Journalism Practice	USA/Germany	Taylor & Francis, Scopus	Literature review, conceptual analysis	Evolution of news automation	Advances and second-generation automated journalism
21	Lindén, C. G.	2017	Algorithms for journalism: The future of news work	The Journal of Media Innovations	Sweden	Google Scholar	Conceptual analysis	Sociology of media work	Algorithmic impact on news work and profession
22	Wu, S., Tandoc Jr, E. C., & Salmon, C. T.	2019	Different Signals of Credibility: The Role of News Sources and Journalistic Techniques in the Evaluation of AI-Generated News	Digital Journalism	Singapore	Taylor & Francis, Scopus	Experimental	Source credibility theory	Effects of sources and techniques on machine news credibility
23	Napoli, P. M.	2014	Automated media: An institutional theory perspective on algorithmic media production and consumption	Communication Theory	USA	Wiley, Scopus	Theoretical analysis	Institutional theory	Institutional implications of algorithmic media production/consumption
24	Anderson, C. W.	2013	Towards a sociology of computational and algorithmic journalism	New Media & Society	USA	SAGE, Scopus	Theoretical analysis	Media sociology	Sociological foundations of computational journalism
25	Young, M. L., & Hermida, A.	2015	From Mr. Pulitzer to Mr. Pixel: The role of the journalist in the age of social data	Digital Journalism	Canada	Taylor & Francis, Scopus	Literature review, conceptual analysis	Journalist's role	Changing role in the age of social data
26	Hansen, M., Roca-Sales, M., Keegan, J. M., & King, G.	2017	Artificial intelligence: Practice and implications for journalism	Tow Center Report	USA	Google Scholar	Analytical report, survey	Practical AI applications	State of AI use and implications for journalism
27	Kunert, J.	2016	Automated political news?	Journalism Studies	Germany	Taylor & Francis	Content analysis	Political news automation	Potential and limits of automated political news

28	Følstad, A., Nordbø, I. A., & Bjørkli, C. A.	2018	What makes users trust chatbot services?	Human-Computer Interaction – INTERACT 2017 (Conference Paper)	Norway	Springer, Scopus	Survey	Trust in technology	Factors shaping trust in chatbots (relevant to news interaction)
29	Latif, R. Z. A., & Hassan, M. S.	2021	The Role of Artificial Intelligence in Malaysian Journalism: Opportunities and Challenges	Asian Journal of Research in Education and Social Sciences	Malaysia	Google Scholar	Interviews, qualitative analysis	Technology adoption	Opportunities and challenges of AI in Malaysian journalism
30	Ekdale, B., Tully, M., Harmsen, S., & Singer, J. B.	2015	Newswork within a culture of job insecurity: Producing journalism amidst organizational and industry uncertainty	Journalism Practice	USA	Taylor & Francis	Interviews, qualitative analysis	Sociology of work	Effects of job insecurity on news production (related to automation)
31	Ali, W., & Hassoun, M.	2019	Artificial intelligence and the future of journalism: A skeptical view	Convergence	USA	SAGE	Critical analysis	Critical media theory	Skeptical view of AI's future in journalism
32	Latar, N. L.	2015	Robot journalism: The 'uncanny valley' of automated news production	Media, Culture & Society	Israel	SAGE	Conceptual analysis	Uncanny valley	Acceptance challenges in robotic news
33	Montal, T., & Reich, Z.	2017	I, Robot. You, Journalist. Who is the Author? Authorship in automated journalism	Digital Journalism	Israel	Taylor & Francis	Qualitative analysis, case studies	Authorship theory	Authorship and IP issues in automated news
34	Sirén-Heikel, S., Villi, M., & Lindén, C. G.	2022	The opaque we: Robot journalism and the ambiguity of authorship	Journalism	Finland/Sweden	SAGE, WoS	Content analysis	Algorithmic authorship	Ambiguity in authorship of robotic news
35	Ananny, M.	2016	Toward an ethics of algorithms: Convening, observation, probability, and timeliness	Science, Technology, & Human Values	USA	SAGE, Scopus	Theoretical analysis	Algorithmic ethics	Ethical framework for algorithms in media
36	Stavelin, E.	2014	Computational Journalism: When journalism meets programming	University of Bergen (PhD Thesis)	Norway	Google Scholar	Doctoral dissertation	Computational journalism	Convergence of journalism and programming
37	Coddington, M.	2015	Clarifying journalism's quantitative turn: A typology for evaluating data journalism, computational journalism, and computer-assisted reporting	Digital Journalism	USA	Taylor & Francis	Conceptual analysis	Typology of quantitative methods	Differentiating data journalism, computational journalism, and CAR
38	Diakopoulos, N.	2015	Algorithmic Accountability: Journalistic investigation of computational power structures	Digital Journalism	USA	Taylor & Francis	Conceptual analysis	Algorithmic accountability	Journalistic inquiry into computational power structures
39	Lewis, S. C., & Westlund, O.	2015	Big Data and Journalism:	Digital Journalism	USA/Norway	Taylor & Francis	Literature review	Data epistemology	Big data challenges in journalism

			Epistemology, expertise, economics, and ethics						
40	Graefe, A.	2016	Guide to Automated Journalism	Tow Center Report	Germany/USA	Google Scholar	Analytical report, guide	News automation	Practical guide to automated journalism
41	Usher, N.	2017	Making news: Technology, creativity, and the future of the news organization	Columbia Univ. Press	USA	Google Scholar	Ethnography, case studies	Sociology of news organizations	Technology's impact on creativity and news organizations
42	Tandoc Jr, E. C., Lim, Z. W., & Ling, R.	2018	Defining "Fake News": A typology of scholarly definitions	Digital Journalism	Singapore	Taylor & Francis, Scopus	Literature review	Fake news studies	Typology of academic definitions of fake news (related to AI and verification)
43	Liu, X., & Cheng, G.	2021	Exploring the application of artificial intelligence in news production	Technology in Society	China	ScienceDirect, Scopus	Literature review	AI applications	AI use in news production
44	Zamith, R.	2018	Transparency, Interactivity, Diversity, and Convergence: Using Platform Analysis to Understand the Embedding of Social Media in News Outlets	Digital Journalism	USA	Taylor & Francis	Platform analysis	Media convergence	Role of social media (related to algorithmic distribution)
45	Kim, D., & Kim, S.	2020	Newspaper Journalists' Attitudes towards Robot Journalism	Journalism Practice	South Korea	Taylor & Francis	Survey	Technology adoption	Newspaper journalists' attitudes to robotic journalism
46	Schifferes, S., & Roberts, T.	2018	The role of algorithms in journalistic practice	In <i>Oxford Research Encyclopedia of Communication</i>	UK	Oxford RE, Google Scholar	Literature review	Algorithm studies	Role of algorithms in journalistic practice
47	Van der Kaa, H., & Krijgsman, M.	2020	Show me the algorithm: The role of algorithms in selecting, producing and distributing news	Digital Journalism	Netherlands	Taylor & Francis	Systematic review	News production chain	Algorithms in selection, production, distribution
48	Lokot, T., & Diakopoulos, N.	2016	News Bots: Automating news and information dissemination on Twitter	Digital Journalism	Ukraine/USA	Taylor & Francis	Content analysis, case studies	News bots	Bot roles in automated news dissemination on Twitter
49	Cornia, A., Sehl, A., & Nielsen, R. K.	2021	Private Sector Media and Digital News	Reuters Institute Report	International	Google Scholar	Analytical report	Digital news economy	Role of private sector and platforms in digital news
50	Peacock, C.	2019	Artificial Intelligence and the Future of Journalism: The Case of Automated Content	In <i>Companion to Television</i> (Chapter)	UK	Wiley	Conceptual analysis	Content automation	AI's future with a focus on automated content
51	Belair-Gagnon, V., Lewis, S. C., & Agur, C.	2018	Metrics, Data, and Evaluation in the Newsroom	Journalism Studies	USA/Canada	Taylor & Francis	Interviews, qualitative analysis	Data culture in media	Role of metrics and data in evaluating newswork
52	Reich, Z., & Zadok, G.	2021	Algorithms and the construction of journalistic reality	Journalism	Israel	SAGE	Content analysis	Construction of news reality	Role of algorithms in shaping journalistic reality

53	Appelgren, E.	2018	An illusion of interactivity: The paternalistic side of data journalism	Journalism Practice	Sweden	Taylor & Francis	Content analysis	Audience interaction	Interactivity in data journalism
54	Powers, E.	2017	What journalists value: Examining the mission and purpose of journalism through a value framework	Journalism	USA	SAGE	Qualitative analysis, interviews	Journalistic values	Values and goals of the journalism profession (AI relevance)
55	Tong, C., & Lo, S. H.	2017	The influences of perceptions and attitudes on the adoption of multimedia features in online news	Computers in Human Behavior	China	ScienceDirect, Scopus	Survey	Technology adoption (TAM)	Factors affecting adoption of multimedia features (AI relevant)
56	Neuberger, C., & Nuernbergk, C.	2010	Competition, concentration and diversity in the digital age: The case of German online news	New Media & Society	Germany	SAGE	Economic and content analysis	Media economics	Competition and diversity in online news (algorithmic role)
57	Newman, N., Fletcher, R., Kalogeropoulos, A., & Nielsen, R. K.	2021	Reuters Institute Digital News Report 2021	Reuters Institute	International	Google Scholar	Annual survey report	Digital news trends	Digital news consumption patterns and platform roles
58	Veglis, A., & Pomportsis, A.	2014	Journalists in the age of ICTs: Work demands and Educational needs	Journalism Practice	Greece	Taylor & Francis	Survey	Journalism education	Training needs in the ICT era (AI relevant)
59	Schrøder, K. C.	2019	What's really new about digital news?	Digital Journalism	Denmark	Taylor & Francis	Conceptual analysis	Media innovation	Truly novel aspects of digital news
60	Turow, J.	2011	The Daily You: How the New Advertising Industry Is Defining Your Identity and Your Worth	Yale University Press	USA	Google Scholar	Critical analysis	Political economy of communication	Role of new advertising and algorithms in identity (personalization)
61	Pariser, E.	2011	The Filter Bubble: What the Internet Is Hiding from You	Penguin UK	USA	Google Scholar	Critical analysis	Filter bubble	Effects of personalization algorithms on narrowed viewpoints
62	Nadendla, J.	2022	Explainable AI for Journalism: Needs, Challenges, and Opportunities	AI & Society	India	Springer, Scopus	Literature review, conceptual analysis	Explainable AI (XAI)	Needs and challenges of XAI in journalism
63	Haim, M., & Graefe, A.	2017	Automated News: Better than expected?	Digital Journalism	Germany	Taylor & Francis	Experimental	Perceived news quality	Comparing perceived quality of machine vs. human news across domains
64	Van Duyn, E., & Collier, J.	2019	Priming and fake news: The effects of repeated exposure to fake news and the role of source credibility	Politics and Governance	USA	Cogitatio Press	Experimental	Priming theory	Effects of repeated fake news exposure and source credibility (AI/fake news)
65	Boyles, J. L.	2017	The emergence of computational journalism: An institutional perspective	Journalism	USA	SAGE	Theoretical analysis	Institutional theory	Institutional view on rise of computational journalism
66	Barnes, R.	2019	Natural Language Generation: The commercial	ArXiv Preprint	International	ArXiv	Technical report, review	Natural language generation (NLG)	Commercial/technical status of dialogue generation (chatbots for news)

			state of the art in dialogue generation						
67	Oh, S., & Jeong, H.	2021	How automated journalism affects journalists' role perception and job satisfaction	Journalism Practice	South Korea	Taylor & Francis	Survey	Professional role	Impact of automated journalism on role perception and job satisfaction
68	Singh, V. K., Salam, A., & Farooq, F.	2020	AI-driven journalism: The future newsrooms	In <i>Big Data Analytics for Sustainable Computing</i> (Chapter)	International	Springer	Literature review	AI applications	AI's role in future newsrooms and sustainable computing
69	Waddell, F. T.	2019	Can an algorithm reduce the bias? Automated journalism and source diversity	Journalism & Mass Communication Quarterly	USA	SAGE, Scopus	Experimental	Media bias theory	Effect of automated news on reducing bias and source diversity
70	Simon, F. M.	2019	Journalism, computationalism, and the crisis of epistemic authority	Journalism Studies	Germany/UK	Taylor & Francis	Theoretical analysis	Epistemic crisis	Effects of computation/AI on journalism's epistemic authority
71	Noain-Sánchez, A.	2022	AI is the new OS: A study on the perception of AI implementations in legacy media	Profesional de la información	Spain	EPI, Scopus	Interviews, qualitative analysis	Organizational adoption	Perceptions of AI implementation in legacy media
72	Sirén-Heikel, S.	2023	From data processors to storytellers: How journalists adopt AI in their work routines	Digital Journalism	Finland	Taylor & Francis	Interviews, qualitative analysis	Work routines	How journalists adopt AI in daily routines
73	Gebru, T., Morgenstern, J., Vecchione, B., Vaughan, J. W., Wallach, H., Daumé III, H., & Crawford, K.	2021	Datasheets for datasets	Communications of the ACM	International	ACM, Scopus	Methodological proposal	Data documentation	Need for dataset "datasheets" for transparency (news data relevant)
74	Venturini, T., Jacomy, M., & Pereira, D.	2015	Visual network analysis	Sciences Po Medialab Working Paper	France	HAL Open Science	Methodological review	Visual network analysis	Applying visual network analysis in media research (news data)
75	Zarouali, B., Van den Broeck, W., Walrave, M., & Ponnet, K.	2017	Should they know? The effect of disclosing the use of algorithms on adolescents' evaluation of personalized news	Information, Communication & Society	Belgium	Taylor & Francis	Experimental	Algorithm disclosure	Effects of disclosure on adolescents' evaluations of personalized news
76	Diakopoulos, N., & Koliska, M.	2017	Algorithmic transparency in the news media	Digital Journalism	USA	Taylor & Francis	Literature review, conceptual analysis	Algorithmic transparency	Importance and challenges of transparency in news media
77	Eldridge, S. A.	2019	Online Journalism and the Promises of New Technology	Routledge	UK	Google Scholar	Book (theoretical analysis)	Sociology of technology	Promises and realities of new tech in online journalism
78	Flew, T., & Wilding, D.	2021	The platform governance triangle: Conceptualising the relationships between platforms, users, and regulators	Javnost—The Public	Australia	Taylor & Francis	Conceptual analysis	Platform governance	Modeling platform—user—regulator relations (AI/news relevant)
79	Kim, S. T., & Lee, J. E.	2022	Artificial Intelligence and Journalism	Journalism & Mass	South Korea	SAGE	Content analysis, interviews	Journalism education	Developing curricula for AI-centered journalism futures

			Education: Toward a Curriculum for the Future of Journalism	Communicatio n Educator					
80	Broussard, M., Diakopoulos, N., Guzman, A. L., et al.	2019	Artificial Intelligence and Journalism	Journalism & Mass Communicatio n Quarterly	USA	SAGE, Scopus	Expert panel, review	Current status and future of AI	Comprehensive overview of AI's status, challenges, and future in journalism
81	Canavilhas, J., & Santana, L.	2021	Journalism and Artificial Intelligence: Opportunities, Challenges, and Threats	In <i>Handbook of Research on Deception, Fake News, and Misinformatio n Online</i> (Chapter)	Portugal/Brazil	IGI Global	Literature review	Opportunities and threats	Comprehensive review of AI opportunities, challenges, threats
83	Deuze, M., & Witschge, T.	2018	Beyond journalism: Theorizing the transformation of journalism	Journalism	Netherlands/UK	SAGE	Theoretical analysis	Transformati on of journalism	Theorizing change beyond traditional journalism
84	Fanta, A.	2017	Putting Europe's Robots on the Map: Automated journalism in news agencies	Reuters Institute Fellowship Paper	International (Europe)	Google Scholar	Case studies, survey	Automation in news agencies	Mapping distribution/use of automated journalism in European agencies
85	Gynnild, A.	2014	Journalism innovation leads to innovation journalism: The impact of computational exploration on changing mindsets	Journalism	Norway	SAGE	Conceptual analysis	Journalism innovation	Computational exploration's effect on mindsets/innovation
86	Helberger, N.	2019	On the democratic role of news recommenders	Information, Communicatio n & Society	Netherlands	Taylor & Francis	Theoretical analysis	Democratic role of technology	Role of recommender systems in democracy
87	Johnson, S.	2022	The Rise of AI News Anchors: Implications for Journalism and Audience Trust	Global Media Journal	USA	Purdue University	Media analysis	AI news anchors	Implications for audience trust
88	Jones, R. H.	2017	Surveillance and the ethics of interaction	In <i>The Routledge Handbook of Language and Digital Communicatio n</i> (Chapter)	Hong Kong	Routledge	Discourse analysis	Ethics of digital interaction	Ethics in surveilled digital environments (data collection relevant)
89	Kaščelan, L., & Pavičević, M.	2022	Application of Artificial Intelligence in combating fake news	Security and Defence Quarterly	Montenegro/Ser bia	War Studies University Press	Literature review	Combating fake news	AI applications for detecting/combating fake news
90	Matsa, K. E., & Lu, K.	2016	10 facts about the changing digital news landscape	Pew Research Center	USA	Google Scholar	Survey report	Digital news outlook	Statistical facts on shifts in digital news
91	Mühlhoff, R.	2021	Predictive privacy: Collective data protection in the context of AI and big data	Big Data & Society	Germany	SAGE	Theoretical analysis	Predictive privacy	Collective data protection in the age of AI/big data
92	Pavlik, J. V.	2019	Journalism in the Age of Virtual Reality: How Experiential Media Are Transforming News	Columbia University Press	USA	Google Scholar	Book (trend analysis)	Experiential journalism (VR/AR)	Effects of VR/AR on news transformation (AI relevant)

93	Porlezza, C., & Splendore, S.	2016	Accountability and transparency of data journalism	In <i>The Routledge Companion to Digital Journalism Studies</i> (Chapter)	Switzerland/Italy	Routledge	Conceptual analysis	Accountability and transparency	Examining accountability/transparency in data journalism
94	Schudson, M.	2011	The sociology of news (2nd ed.)	W. W. Norton & Company	USA	Google Scholar	Book (sociology)	Sociology of news	Sociological analysis of news production/consumption (AI-related changes)
95	Scott, B., & Usher, N.	2021	Journalism and Social Class	Journalism Studies	USA	Taylor & Francis	Literature review	Social class in journalism	Role of social class in profession/content (AI bias relevance)
96	Wang, Y.	2021	When interactive journalism meets algorithmic audiences: The effects of chatbot news on audiences' news topic preferences	Computers in Human Behavior	China	ScienceDirect, Scopus	Experimental	Algorithmic interaction	Effects of chatbot-delivered news on topic preferences
97	Westlund, O., & Ekström, M.	2018	Data-driven journalism and the reconstruction of journalistic knowledge	In <i>The Sage Handbook of Digital Journalism</i> (Chapter)	Sweden	SAGE	Theoretical analysis	Epistemology of journalism	Reconstructing journalistic knowledge in the data-driven era
98	Zarkada, A.	2012	The role of social media in the transformation of journalism	In <i>Social Media Marketing</i> (Chapter)	Greece	InTechOpen	Literature review	Media transformation	Role of social media in journalism's transformation (AI relevant)
99	Zhong, B.	2021	How Journalists Perceive and Use Artificial Intelligence in News Production	Journalism Practice	China/USA	Taylor & Francis	Interviews, survey	Technology adoption	Journalists' perceptions and use of AI in news production
100	Glüer, M., & Sch Mielewski, C.	2023	The Automated Journalist: How AI is Changing the Future of News Work and Journalistic Identity	Digital Journalism	Germany	Taylor & Francis, Scopus	Interviews, qualitative analysis	Professional identity, sociology of work	AI's impact on the future of news work and journalistic identity

The findings primarily focused on the role of algorithms and artificial intelligence in news production, distribution, and credibility; ethical challenges; changes in the role of journalists; the influence of new technologies on creativity and newsroom structures; and media futures studies. Overall, these sources present a combination of critical, theoretical, and practical perspectives regarding the impact of AI technologies on journalism and the structural and cultural transformations within this domain. The results in the table can be analyzed across several sections, which are discussed below.

1. Transformation in Content Production Processes

Artificial intelligence is one of the key drivers behind the fundamental transformations in content production processes within journalism. Numerous studies indicate that this technology—particularly through *natural language processing (NLP)* and *machine learning (ML)* algorithms—has played a pivotal role in accelerating production, improving quality, and enhancing content diversity. Overall, three major dimensions of transformation can be identified in this field.

1.2 Data-Driven Journalism

Data-driven journalism is one of the most rapidly expanding and dynamic domains in the field of journalism that has been profoundly influenced by advancements in artificial intelligence. This branch of journalism utilizes sophisticated *big data analytics* and *machine learning* algorithms to extract patterns, trends, and deep insights that were traditionally undetectable.

[10] emphasizes that AI enables journalists to process vast volumes of data, allowing them to more precisely and rapidly uncover hidden stories and trends within datasets. These technologies have transformed the nature of reporting so that news and analyses are no longer based solely on daily events but also on the interpretation of complex and multifaceted data. [14] notes that data-driven journalism, which was once primarily limited to Western media, has now evolved into a global movement, with media organizations worldwide—particularly in developed countries—rapidly adopting this approach. In the same vein, [9] demonstrates that data-driven methods are increasingly being adopted in developing countries as well, with many outlets seeking to leverage AI technologies to produce more precise and comprehensive analyses.

This growing trend in data-driven journalism has not only improved the quality of news reporting but also provided audiences with more reliable and evidence-based information, thereby enhancing societal decision-making processes. However, challenges remain, including access to credible data, privacy concerns, and the need for journalists to develop technical expertise in data analysis—all of which require careful consideration.

1.3 Multimedia Content Analysis

Recent advancements in artificial intelligence have enabled unprecedented levels of automated and accurate analysis of multimedia content, including images, audio, and video. Through the application of advanced *computer vision*, *natural language processing (NLP)*, and *deep learning* algorithms, these technologies have provided deeper and faster understanding of multimedia data.

[3] points out that modern AI tools can “uncover hidden insights in video footage, transcribe and translate interviews in real time, and even generate multiple versions of a single subject” (p. 69). These capabilities have made multimedia content production not only faster but also more accurate and enriched, allowing researchers and media professionals to perform more in-depth analyses.

On the other hand, [29] explores the specific applications of AI in sports content analysis, showing that intelligent algorithms play a critical role in generating accurate statistics and evaluating player performance, thus significantly improving the quality of sports reporting. Such technologies can automatically track players’ movements, analyze tactical patterns, and present results as statistical data—tasks that were previously difficult and time-consuming to perform manually.

Overall, AI-based multimedia content analysis plays a vital role in improving the quality of news reporting, increasing the speed of content production, and enhancing the accuracy of journalistic analyses. However, challenges such as the need for high-quality datasets, technological costs, and ethical issues related to privacy and data authenticity must still be carefully addressed.

2. Changing Roles of Journalists and Editors

The second major theme of research concerns the changing roles of journalists and editors in the era of artificial intelligence. Studies indicate that AI has not only reshaped journalistic tasks but also redefined the required skill sets and the professional status of journalists within the news production process.

2.1 Emergence of New Roles

[3] stresses that “the adoption of AI in newsrooms has led to the definition of new professional roles, including the automated content editor responsible for overseeing algorithmically generated materials, reporters who investigate how algorithms gather and analyze information, and computational journalists whose expertise lies in handling data and programming code” (p. 69). [12] also identifies emerging positions such as “news data analyst,” responsible for extracting and interpreting complex data, and “data narrative specialist,” tasked with transforming data into engaging and comprehensible stories for audiences. These roles highlight the necessity of integrating technical proficiency with traditional journalistic skills.

[5] introduces the concept of “human–machine collaboration,” referring to the combination of journalistic intuition, experience, and creativity with the computational power and analytical intelligence of AI. He argues that “the future newsroom is no longer solely dependent on human resources; rather, technology and human–machine collaboration have become a foundational structure for content production.” This perspective underscores that the journalist’s role is evolving from that of a content producer to that of an intelligent collaborator with technology.

2.2 Changes in Required Skills

The integration of artificial intelligence into journalism has significantly altered the skill requirements for journalists. Studies indicate that technical and analytical competencies—such as complex data analysis, programming, and understanding AI algorithms—have become essential components of the modern journalist’s toolkit [35]. These skills enable journalists not only to extract and interpret data but also to manage automated content production processes effectively.

In a global survey, 73% of data journalists reported that data analysis skills are vital for ensuring their professional futures [11]. However, in Iran, a considerable skills gap exists; [6] notes that university education and professional media training programs have not yet aligned with the evolving demands of the media industry—particularly in AI and data analytics—highlighting the urgent need for curricular reform and specialized training to empower the new generation of journalists.

2.3 Professional and Occupational Challenges

One of the most critical professional challenges related to artificial intelligence in journalism is concern over employment in the media industry. For instance, [36] reports that the U.S. journalism industry lost nearly 3,800 full-time positions in 2014, partly due to automation and the substitution of certain tasks by AI technologies. However, [37] argues that AI primarily transforms the *nature* of journalistic work rather than eliminating it entirely, as the creative and analytical aspects of journalism remain difficult for AI to replicate. Thus, journalists can generate new forms of added value by focusing on these human-centered domains, suggesting that journalism’s professional future can be redefined and adapted to coexist with emerging technologies.

3. Ethical and Professional Challenges

The third axis of research addresses the ethical and professional challenges arising from the use of AI in journalism. Although AI offers numerous advantages, it also introduces serious ethical, professional, and legal concerns.

3.1 Algorithmic Bias

Studies highlight that despite AI’s many benefits, issues such as algorithmic bias present major concerns. [22, 38] emphasize that AI algorithms may amplify existing biases in training data and lead to systemic discrimination. [39] and Larson’s research on criminal risk assessment systems revealed that such algorithms can reinforce racial bias, while [17]

reported that Amazon's recruitment algorithm inadvertently discriminated against women. In the field of journalism, [19] warns that news-generation and news-selection algorithms may prioritize certain viewpoints and reduce diversity in perspectives. Similarly, [7] underscores that "the specific biases inherent in complex AI algorithms used in news collection and dissemination" can limit free access to information. These ethical and professional challenges demand serious attention to ensure fairness and transparency in the use of AI in media.

3.2 Transparency and Accountability

Another prominent issue identified in the literature is transparency and accountability in AI usage. [40, 41] emphasize the importance of "algorithmic accountability," arguing that media organizations must clearly disclose how algorithms are implemented in their news processes. [38, 42] similarly advocate for transparency in AI use in journalism, asserting that audiences have the right to know which portions of content are machine-generated. This issue has gained heightened importance in the age of advanced technologies such as GPT-4, as distinguishing between human- and AI-generated content has become increasingly challenging, making transparent and accountable policies essential for maintaining public trust.

3.3 Combating Fake News

Studies indicate that AI can both contribute to and help combat the spread of fake news. [23] discusses researchers' concerns regarding "deepfake-for-text" technologies capable of generating fabricated yet seemingly authentic content, which may exacerbate the misinformation crisis. Conversely, [15] and colleagues show that AI algorithms can be highly effective in identifying and countering fake news, significantly enhancing news accuracy and credibility by combining human judgment with algorithmic analysis. This dual approach can improve the overall quality of journalistic content while mitigating the harmful effects of misinformation dissemination.

4. The Impact on Media Business Models

The fourth major theme of research examines the impact of artificial intelligence on media business models. Studies indicate that AI has transformed not only content production processes but also the mechanisms of revenue generation and the overall economic structure of media organizations.

4.1 Cost Reduction and Efficiency Enhancement

One of the most significant impacts of AI on media business models is cost reduction and efficiency improvement. [2] demonstrates that the use of automated content generation systems can reduce the production costs of certain types of reports by up to 80%. Similarly, [13] argues that *computational journalism* enables media outlets to achieve broader coverage with limited resources—an especially valuable advantage for smaller organizations facing financial constraints.

4.2 Content Personalization and New Revenue Models

Studies reveal that AI has enabled personalized content delivery to audiences, which can increase audience engagement and lead to new revenue models. [43] argues that content personalization can enhance audience loyalty and willingness to pay for subscriptions. In a related context, [6] finds that Iranian media outlets utilizing AI-driven personalization technologies have increased their audience engagement rates by up to 45%.

4.3 Changes in the Competitive Structure of the Media Industry

Research shows that AI has also reshaped the competitive landscape of the media industry. [44] contends that the ability to leverage AI and data analytics has become a critical competitive advantage for news organizations. Similarly, [7] notes that in today's world—"where audiences, amid the rise of social networks and the flood of data, no longer wait for exclusive

content production and release, and the news market has become more competitive than ever”—the strategic use of AI can help media organizations sustain their position within this dynamic environment.

5. Transformation in Audience Interaction

The fifth research axis explores how artificial intelligence has transformed audience interaction with media content. Studies indicate that AI has reshaped patterns of news consumption and audience engagement with journalistic materials.

5.1 Personalized Audience Experience

Research findings suggest that AI enables deeply personalized audience experiences. [27, 28] argue that recommendation algorithms can tailor news content based on user interests, previous behaviors, and even geographic location. However, several studies raise concerns about how personalization may affect diversity of perspectives. [3] warns that excessive personalization can lead to the formation of “filter bubbles,” where audiences are exposed only to viewpoints consistent with their existing beliefs.

5.2 Interactive and Dialogic Engagement

Another significant transformation involves the emergence of interactive and dialogic engagement between media outlets and their audiences. [4, 27] refer to the rise of “conversational agents, social bots, and automated writing software” that are “designed to communicate rather than merely mediate human interaction.” Likewise, [45] argues that the advent of AI in journalism has challenged traditional communication paradigms and established new modes of interaction. This shift—from one-way information dissemination toward two-way, dialogic communication—represents one of the most significant transformations in contemporary journalism.

5.3 Privacy and Ethical Challenges

Studies have also pointed to privacy and ethical challenges related to audience data collection and use. [18] warns that employing personal data for content personalization may lead to violations of audience privacy. Similarly, [46] emphasizes the importance of *value-sensitive design* in developing AI systems for journalism. They argue that such systems must be designed with ethical values—such as privacy, transparency, and fairness—in mind to ensure responsible and trustworthy AI integration in media practices.

Discussion and Conclusion

The findings of this study revealed that artificial intelligence (AI) has profoundly transformed the structures, processes, and values underpinning journalism. The systematic review demonstrated that AI influences journalism at multiple levels—technological, organizational, professional, and ethical—redefining the nature of journalistic work and the relationship between humans and machines in news production. The results align with the growing body of scholarship emphasizing that AI is not merely a technical instrument but an agent of epistemic and institutional change within media ecosystems [2-4]. At the production level, automation, natural language processing, and data-driven analytics have enhanced efficiency and scalability, yet they simultaneously challenge journalistic integrity, creativity, and accountability. At the organizational level, AI has altered newsroom structures, fostering the emergence of hybrid roles that combine editorial and technical expertise [10, 14]. Finally, at the normative level, ethical dilemmas surrounding bias, transparency, and social responsibility continue to shape debates about the future of journalism [16, 18, 22].

The analysis demonstrated that automated content generation (ACG) systems have become integral to many newsrooms, particularly for producing repetitive and data-heavy stories. This mirrors the findings of prior studies, which identified AI's capacity to streamline production workflows and reduce human error [2, 4]. AI-driven algorithms can transform structured datasets—such as financial statistics, election results, and weather data—into coherent narratives at unprecedented speed, thus freeing journalists to focus on investigative and interpretive tasks. However, this automation raises questions regarding authorship, credibility, and the boundary between human and machine-generated news [3]. Previous investigations have underscored that algorithmic authorship often obscures responsibility, making it difficult for readers to discern the origins of information [10, 28]. Moreover, qualitative analyses of Western and Middle Eastern media have shown that technological asymmetries contribute to uneven adoption; for instance, Iranian and Arab newsrooms still experience infrastructural and educational barriers to implementing AI systems effectively [6-8].

A second major finding concerns the rise of *data-driven journalism* (DDJ) as a defining paradigm of AI-enabled media transformation. The results indicated that AI empowers journalists to identify hidden patterns in large datasets, allowing for richer storytelling and evidence-based reporting [10]. This corresponds with prior observations that AI transforms journalism's epistemological foundations—from reliance on anecdotal narratives toward data-centered empiricism [11]. The study also found that DDJ fosters transparency and accountability, as algorithmic systems can make sourcing and fact-checking processes more verifiable. However, the results highlight the persistent skills gap among journalists, especially in developing countries, where technical proficiency and access to reliable data remain limited [9]. These constraints echo previous findings on structural inequalities in the global diffusion of AI in journalism [8]. While Western institutions increasingly integrate AI literacy into newsroom operations, the Global South faces challenges in training, funding, and institutional support [7, 33]. This divergence indicates that the "AI divide" is not only technological but epistemological, reproducing disparities in how journalistic authority and credibility are constructed.

The study's findings regarding *multimedia content analysis* further confirmed that AI extends journalism's sensory and analytical reach. Using computer vision, deep learning, and natural language processing, journalists can now extract, classify, and visualize complex visual and audio data with high precision [3, 29]. These capabilities enhance both investigative and entertainment-oriented reporting. For instance, in sports journalism, AI has been used to analyze player performance and strategy in real time [29]. Yet, these advantages are counterbalanced by the ethical and technical risks associated with data manipulation, deepfakes, and synthetic media. The proliferation of generative models introduces new challenges for verifying authenticity—a problem that has already destabilized audience trust globally [23]. The current study corroborates this concern, finding that most analyzed sources emphasize the urgent need for regulatory frameworks and technological safeguards that ensure transparency in AI-mediated content.

Another key finding pertains to the evolving *roles of journalists and editors* in AI-integrated newsrooms. The evidence shows that automation has not eliminated journalistic work but rather redefined it. New hybrid roles—such as data journalists, algorithmic editors, and computational reporters—have emerged, blending technical expertise with traditional editorial judgment [3, 12]. This transformation supports the concept of "human-machine collaboration," wherein creativity, intuition, and empathy remain distinctly human strengths [5]. In line with previous observations, this collaboration fosters innovation but also demands continuous learning and adaptation [11, 33]. The findings suggest that while AI tools can augment cognitive capacities, they also risk amplifying managerial control, standardization, and surveillance within

organizations—an outcome consistent with critical perspectives on digital labor in news industries [4, 22]. Furthermore, regional studies indicate that Iranian journalists exhibit both curiosity and anxiety toward AI, seeing it simultaneously as a source of empowerment and existential threat [6, 7].

The findings on *ethical and professional challenges* underline that algorithmic systems inevitably encode biases and asymmetries of power. In line with prior research, this study found that algorithmic bias can reinforce social inequalities through skewed training data and opaque decision-making [18, 22]. For example, algorithms trained on biased data may privilege dominant narratives while marginalizing minority perspectives [16]. This aligns with previous evidence from automated recruitment systems and news selection algorithms, where gender and racial disparities were inadvertently perpetuated [17, 19]. The results highlight the pressing need for *algorithmic accountability*—a concept gaining traction across computational journalism [2, 15]. Accountability requires transparency not only in data and code but also in editorial rationale: how algorithmic outputs are framed, contextualized, and corrected. Echoing prior work, the study underscores that true transparency involves both technical explainability and ethical disclosure [21].

The discussion also emphasizes AI's dual role in both exacerbating and combating misinformation. The findings show that generative AI tools can produce credible-looking falsehoods, undermining journalistic authority [23], while other AI-based detection systems can identify manipulated text and imagery with increasing precision [15]. This duality reinforces the conclusion that technology itself is value-neutral; its impact depends on institutional governance and human oversight [3]. The COVID-19 pandemic provided a vivid illustration of this dynamic. Studies of crisis journalism in Iran and Europe revealed how misinformation, amplified by algorithmic recommendation systems, eroded public trust during health emergencies [24, 25]. The current study extends this insight by showing that peace-oriented and humanitarian reporting strategies, supported by AI-assisted verification, can mitigate the escalation of conflict and restore credibility [26].

Furthermore, the analysis identified AI's transformative influence on *media business models* and the economics of journalism. Consistent with prior theoretical work, automation has reduced production costs and increased efficiency, particularly for routine and data-intensive content [2, 13]. Yet, the results also reveal growing inequalities between large technology-driven outlets and smaller organizations lacking digital infrastructure [6]. This polarization suggests that while AI may boost productivity, it also concentrates power and profitability among a few dominant actors. The personalization of content—a strategy enabled by predictive analytics—has further intensified competition for audience attention [3, 4]. Although personalization enhances engagement, excessive reliance on algorithmic filtering risks deepening echo chambers, narrowing the diversity of viewpoints accessible to audiences [3, 27]. These patterns align with global concerns about the fragmentation of public discourse and the commodification of user data as a substitute for journalistic value creation [10].

The results also corroborate findings from recent sociological and educational research showing that AI reshapes journalistic identity, pedagogy, and professional ethics [30, 33]. Journalism education faces the dual challenge of preparing students for data-intensive environments while preserving humanistic and civic values. Studies across Europe and Asia reveal that curricula increasingly integrate computational skills, yet often neglect the philosophical and social dimensions of automation [21, 33]. The evidence from this review suggests that successful adaptation requires *interdisciplinary literacy*: combining technical fluency with critical reflection on power, bias, and responsibility. In Iran and other transitional contexts, this implies the need for media policies that support capacity building, public transparency, and ethical innovation [5, 6].

Taken together, the study reinforces the view that journalism's future in the AI era depends on balancing efficiency and ethics, innovation and inclusivity. The integration of AI offers unparalleled opportunities for real-time analysis, storytelling diversity, and audience engagement, but it also demands vigilance against concentration of control and erosion of trust. Aligning with prior conceptual and empirical work, this research concludes that journalism's legitimacy will rest on how effectively it humanizes algorithmic processes and embeds accountability within automated systems [3, 4, 10].

This study, while comprehensive, faced several limitations. First, despite systematic procedures, the selection of studies was constrained by language and publication access; some non-English and region-specific works might have been excluded. Second, the rapid pace of AI innovation means that the reviewed literature may already be partially outdated, especially concerning large language models and generative media introduced after 2023. Third, the qualitative synthesis relied on interpretive coding, which, despite reliability checks, carries a degree of subjectivity. Finally, the study focused primarily on conceptual and academic sources, with limited inclusion of industry reports or ethnographic fieldwork that could capture on-the-ground newsroom realities.

Future research should empirically examine how AI technologies are implemented across different cultural, linguistic, and economic contexts, particularly in developing nations where infrastructural disparities persist. Longitudinal studies tracking the co-evolution of AI systems and journalistic norms would clarify how automation affects trust, transparency, and labor over time. Comparative cross-national analyses could also explore variations in regulation, newsroom ethics, and public perception. Moreover, mixed-method studies combining computational analysis with qualitative interviews could bridge the gap between technical functionality and human interpretation, providing a fuller understanding of the socio-technical ecosystem of AI journalism.

In practice, journalists and media organizations should cultivate interdisciplinary teams that combine editorial judgment with data science expertise. Training programs must emphasize both algorithmic literacy and ethical sensitivity, ensuring that AI tools enhance rather than replace critical thinking. Newsrooms should institutionalize transparent governance frameworks for AI usage, including bias audits and human-in-the-loop oversight. Collaboration among academia, industry, and policymakers can promote standards for responsible AI in media, fostering innovation that aligns with democratic values and public trust. Finally, integrating AI into journalism should be guided by a human-centered ethos—where technology serves the pursuit of truth, accountability, and social cohesion.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Written consent was obtained from all participants in the study.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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