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The Use of AI in the Creation of News: Application Framework, Ethical Challenges, and Governance Pathways of AIGC

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SUMMARY: *The rapid creation of technological systems, and the use of Artificial Intelligence (AI) in almost every field, including journalism, is changing the entire news sector. AI is becoming an invaluable tool for journalists in data mining as well as improving their craft. AI enhances efficiency and productivity in news generation. An amazing amount of news products can be created in collaboration with humans and AI. Technology, however, and its rapid advancement creates numerous challenges including every type of problem, as well as, ethical dilemmas. There are problems that are virtually unprecedented. The age of AI is also changing journalism's fundamental principles of accuracy, trust, and copyright, among others. Moreover, the fully automated generation of news products raises important issues including bias, manipulation, lack of accountability, and inaccuracy. Given the increasing use of AI in newsrooms, the roles of AI in the news production process, the loss of human professionalism, and the degree of editorial control need to be addressed. In this paper, I focus on the integration of AI in news production, the collaboration of humans and AI in news production, and the integration of AI in the news production process and its positive and negative impacts. Key challenges include balancing efficiency and ethics, as well as the alignment of AI with the journalistic principles of truth, objectivity, and public trust. This paper addresses such challenges and the future of journalism exacerbated by the presence of AI.*

KEYWORDS: *Artificial Intelligence; News Production; Human-AI Collaboration*

1 Introduction

The last few decades have seen professional providers of news, such as newspapers, television, and news agencies, as the major providers of news. In the traditional models, professional journalists work in a structured hierarchy and oversee the entire process, including information collection, editorial decisions and publishing[1]. The organization relies on a linear communication model: news organizations publish and distribute information, and audiences receive it. The information flows in one direction. There are almost never feedback loops in the information flow[2]. When there are feedback loops, there are delays and the feedback information rarely alters the content.

Digital technologies and intelligent systems continue to disrupt this model. The production of news used to walk through a workflow in a linear step by step manner which was them controlled by institutions[3]. This is now at odds with a media environment that is instantaneously interactive, containing many data points, and is personalized using an

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algorithm. This shows two significant problems with the traditional model. First, manual processes of data filtering and content synthesis in publishing are far outpaced by the input in today's news[4]. This absence of filtering and publishing means the industry is unable to defend itself from breaking news. Second, the industry news logic often overlook and fails to incorporate the user-level data of the news content such as the user's preferences, behaviors and engagement resulting in the news content failing to be relevant, or to achieve the desired effective outcome[5].

With these structural constraints, AIGC has become an important phenomenon. AIGC is the culmination of the transition of AI 1.0, consisting of recognition, and automation, to AI 2.0, which has creation and reasoning[6]. The development of AIGC has been facilitated by the proliferation of GANs, diffusion models, transformers, and large-scale pre-trained language models, which have substantially advanced the ability of AI to generate rich multimodal content automatically[7]. These models, previously set to produce only limited outputs, have gained the ability to generate news articles, summaries, news and editorial headlines, and other creative works in an automated fashion and are doing so at an unprecedented rate[8].

The advent of AI tech in journalism has transformed the field immensely. At the most recent International News Media Association World Congress, some attendees were astonished when an AI program was employed in the Congress's first live news coverage[9]. While some viewed this event as news coverage, others viewed it as news production. The World Congress event was the first instance when AI-generated text was employed, demonstrating how news coverage has changed in the Internet Era and the Otaki AI epoch. During this time, news production and news reporting have become complementary processes[10]. AI has resulted in the increased production of news, and as news production evolves, it is becoming increasingly important for news production reporting to incorporate editorial processes.

This paper analyzes the transformation of the production of news within the purview of AIGC. It assesses the realism of the implementations of the AI-generated Content in the newsrooms, suggests a preliminary model of the human-AI collaboration, and examines the transformation and the investment of ethics and governance[11]. Working towards this end, the objectives of the analysis are to delineate the contours of that, the efficient, and the reliable partnerships between human and AI systems in the modern-day journalism.

2 A Hierarchical Model of Human-AI Collaboration: The Role Evolution from Tool to Partner

2.1 From Gatekeeping to Collaborative Intelligence

The conventional model of news production followed a gatekeeping approach, wherein information is exclusively controlled by trained journalists and professional institutions in regard to its selection, assessment, and distribution[12]. This information process is linear and dominated by human managers, concentrating every step in the process, from information sourcing to publishing on their editorial decisions[13]. The application of artificial intelligence in newsrooms finally initiates the long-anticipated model structural shift. Rather than replacing the journalist, AI reorganizes the division of cognitive and technical labor to allow for a novel hybrid form of production.

AI has started to track, assess, and even trigger alerts to patterns and data. Meanwhile, journalists concentrate on interpretative, ethical, and accountability concerns[14]. Such a

division of labor is more than technological evolution; it alters the core of journalistic practice by transforming the processes of sourcing, producing, and verifying content[15].

As opposed to classic linear hierarchies, contemporary newsrooms have greater flexibility and are designed for human–AI co-agency[16]. Such arrangements are structured around feedback loops in which machines improve a human's ability, and where humans take the lead as consultants, contextualizers, and assigners of value.

This change brings new duties for reporters. They must now be able to decipher and analyze algorithms and know when and what to incorporate from AI. As a result, the classic model of the reporter shifts to a more collaborative editing position[17]. They can even be seen as "supervisors of algorithms."

With the developments in artificial intelligence, control moves from humans alone to a spilt with machines. Newswriting is under joint authorship, with human editors and AI. This realities under the Hierarchial Model of Human-AI Collaboration, in Figure 1.

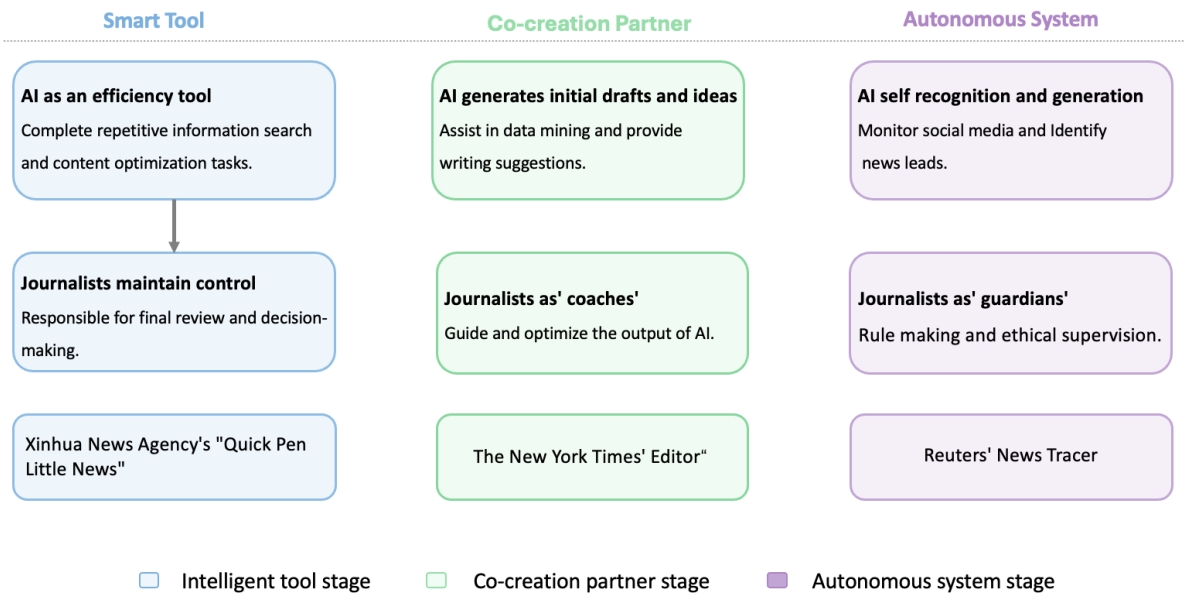

Figure 1: Hierarchical Model of Human-AI Collaboration in News Production

2.2 Three-Tier Structure of Human–AI Collaboration

The development of human–AI interaction in journalism works best with a simple 3-level structure representing the different degrees of technological detachment, creation, and control of the procedure. This structure, as formulated in the Hierarchical Model of Human–AI Collaboration in News Production (Figure 1), shows the advancement of AI technology in the field of journalism from a mere technological instrument to a collaborative editorial partner and, in some instances, to a full autonomous system.

Tier One: Intelligent Tool

Analyzing the basic function of AI in relation to enhancing basic operational effectiveness through the implementation of automation related to performance in executing redundant and scalable tasks, the application of AI in activities such as data scraping, metadata generation, clustering of content, sentiment tagging, summarization of content in real time is clearly evident. Supporting AI systems perform this service at this point in time. The systems increase the speed and volume of alterations to the content. Journalists retain control over the content, direction, tone, and language. Fact checking the content is the job of the humans. AI is not given nor is it responsible for the editorial decision. Operating within the designated

boundaries of control is the job of the AI systems.

Tier Two: Co-Creation Partner

This mid-range level brings about an advancement in both function and role. AI technologies gain their first traits of generative capability. Drafting preliminary versions of articles, proposing potential titles, identifying patterns of stories, and/or offering outlines of the content. Human journalists pivot to an overseeing and selective role. Adjusting some elements of the machine's output for alignment, fact-checking, and contextualizing. The split of tasks becomes a workflow in which the AI writes, while the human edits, modifies, and restructures content. The machines and the people form a feedback loop. The journalists retain the pattern of writing, but the content generation shifts to the machines and humans in collaboration.

Tier Three: Autonomous System

AI systems have, to an extreme degree, developed the ability to identify and track emerging trends, analyze ongoing conversations, assess socio-demographic streams, and write complete stories devoid of any human command. Although fully outfitted with the capacity to operate with no direct human oversight, these systems are still constrained with respect to editorial and ethical considerations. Human editorial supervisors set the limits on what the systems can do, verify the accuracy of information presented, and ensure the professional correctness of the systems. In these situations, the journalists have to act as systems designers and ethical supervisors, with the roles and responsibilities involving no line-editing, just incorporating the systems with socio-structural boundaries.

That's accurate. This three-tier structure demonstrates a continuum from mechanistic automation to relational autonomy. The predicted increase in AI-induced editorial proficiency and the predicted increase in AI-induced editorial proficiency cause newsrooms to transform into multi-agent systems characterized by the specialization of individual tasks, flexible reallocation of tasks, and tiered responsibility. The framework demonstrates the dual expansion of AI and the reconfigured adaptive response of journalistic work to collaboration's transformative power in remapping responsibilities, processes, and the fundamental principles of news work. A comparative overview of the key features across these three tiers is presented in Table 1.

Table 1: The Hierarchical Structure of Human–AI Collaboration in Newsrooms

Tier Level	AI Role	Human Role	Content Ownership	Editorial Responsibility
Tier 1: Tool	Automates repetitive tasks	Maintains full control	Human	Human
Tier 2: Co-creator	Drafts, suggests, edits	Supervises, refines, validates	Shared	Human-led with oversight
Tier 3: Autonomous	Detects trends, drafts independently	Ethical boundary-setter, verifier	Machine-led, reviewed	Human retains authority

2.3 Measuring Collaboration: The Human–AI Collaboration Degree

It will take more than personal experiences to gauge the degree of collaboration between humans and AI during the creation of news articles. A detailed and methodological analysis of the distribution of tasks performed by the human brain and the algorithm is needed. As such, we put forward the Degree of Human-AI Collaboration (C), which aims to quantify the different types and degrees of collaboration along a two-dimensional evaluation framework.

The formula is as follows:

$$C = \alpha * (T\_ai / T\_total) + \beta * (I\_human / I\_total)$$

This model incorporates two primary dimensions:

(1)Task Execution Dimension (T_ai / T_total).

This metric analyzes the time dedicated to performing a specific AI news generation task compared to the entire task duration. The greater this figure, the better the task automation, aiding in gauging the degree to which Artificial Intelligence facilitates the automation of more routine, data-driven jobs, especially in trend spotting, transcription, template writing, and writing categorization. In production settings with an emphasis on speed and volume, this attribute may be a key metric of productivity in the production process.

(2) Cognitive–Creative Dimension (I_human / I_total)

This section addresses the situation where humans add in what evaluative, moral or creative in the result, if at all, justify, and constructive, if at all, justify, and constructive, if at all, justify, and constructive, if at all, justify and constructive and moral supervision. It could be relevant to story construction, major paraphrasing, scope editing, and moral supervision. This dimension deals with the unique human contribution of meaning, coherence of the narrative, and social responsibility of the content.

Definitions of Variables:

$C \in [0, 1]$: Represents the degree of collaboration, from fully human-led (0) to highly integrated (1).

T_ai and T_total: AI and total time invested in task execution.

I_human and I_total: Human editorial input and overall informational content.

α and β: Weighting parameters ($\alpha + \beta = 1$), adjusting emphasis between efficiency and creativity.

This enables businesses and their editors to notice changes in editorial workflow, detect editorial gridlocks, and determine how to best mix people and machines in editorial production. This model also gauges, in an autonomous AI world, how much control and accountability is to be shared in the newsroom.

2.4 Role Transformation and Workflow Restructuring

As human-AI collaboration advances from simple complemented tasks to a more complex symbiosis, the job of a journalist is impacted greatly. In older newsrooms, the process of editing followed a more linear human approach. Journalists would gather, verify, organize, and publish data with little technology used besides rudimentary tools. With the advent of more sophisticated, autonomous, and collaborative with AI systems, this approach is shifting. Journalists are stepping into a more supervisory, and strategic role. Reporting is no longer the primary task of a journalist, and is now algorithmically planned, with editors guiding the machine drafts, organizing the data, and setting the parameters within which the system must work.

This development calls for a total overhaul of news production procedures. In the previous format of the process, information flowed linearly from collection to editing to publishing. In this new process, information will be handled in modular, recursive blocks. Content development will be initiated by AI that drafts, proposes editorial structures, identifies gaps, and even flags inconsistencies and factual errors. Instead of working at the end of the process, journalists will be involved at every step of the way, evaluating the machine outputs, adding contextual information, and reframing the output to be more aligned with editorial and social goals.

Boundaries between expert decision making and routine work are becoming far more lenient. The manually repetitive and data driven work—like basic summarization, spotting

trends, and keyword tagging—are mostly taken over by AI systems. Human work will now turn to higher order thinking: interpreting data and building context, fact checking, and even ethical decision making. The shift creates a positive feedback loop between man and machine. AI suggests structures of content or themes and journalists refine them. Journalists provide the prompts and AI, now in a feedback loop, speeds up the content generation. The nature of the relationship shifts from directive to collaborative.

In this new arrangement, collaboration entails more than simply productive benefits, but also joint authorship and collective responsibility. AI can engage in coherent arrangement and meaning formation and contribute to the structure of an article. Journalists, however, are the final judges of public relevance, and are responsible for adapting the narratives to democratic principles, the surrounding culture, and the goals of the institution. This dual agency populates the newsroom with new capabilities. Editorial teams now must have algorithmic literacy and data fluency, as well as the skills to evaluate the outputs of a machine.

Of utmost importance, this change in roles certainly does shift the human agency in this scenario, though not in such a controlling way as to diminish it. AI becomes more integrated, controlling the more mechanical and computational tasks, allowing journalists to focus on the more complex human interactions of nuance, ethics, and meaning. Instead of altering sentence structure, the journalists focus on the intent of the narrative and the logic used to frame an argument. If certain functions of journalism, such as manual control, were to be automated, the epistemic leadership, as redefined in this example, would lie in the media work in conjunction with the remaining human journalists.

In this renegotiated structure of workflow, reporters serve as shepherds, watchkeepers, and interpreters of the interface between the mechanics of computing and the rationale of the machines and humans. The newsroom exemplifies a space of hybrid intelligence, where human and machine cooperation produces journalism that is credible, ethical, and socially responsible. This change reaffirms that in the age of smart systems, editorial control is not diminished, but rather, transformed.

2.5 Toward a Symbiotic News Ecosystem

Taking into account the Human–AI Collaboration Degree (C) together with the hierarchal collaboration model, we can conclude that the future of journalism will be working in symbiotic systems. In the model of the newsroom, humans and AIs together make sense of the content and manage the decisions, collaboratively controlling the parameters of newsworthiness and ethics.

AI’s automation of content creation, expediting of data processing, and scaling of output helps free journalists from repetitive tasks, enabling them to write and tell stories with more depth and focus on issues that truly matter to the audience. However, AI’s moral reasoning and cultural and contextual nuances are gaps where humans are the best fit. This complementarity is why the balance of machine and human is sustainable.

As level of collaboration (C) increases, the interaction of humans and AI progresses from task assignment to task co-creation. Editors become designer systems and oversee the ethics, controlling the output of the machines through prompts, feedback, and iteration. These instructions become part of the AI's education. At the same time, AI systems improve by synthesizing human feedback and start to match their outputs to the expectations of the profession and the audience.

The relationship turns the newsroom into a socio-technical system that is flexible and fully collaborativly managed, and helps the hybrinity of the newsroom. The production of news is not a linear process, but rather a flexible, interactive practice, where the roles, value, and limits of both the human and the machine participants are continuously negotiated.

In this symbiotic model, there are no trade-offs. Instead, it suggests the best possible merging of the two, where the first is democratic oversight and accountability, and the second is sophisticated relational, rapid, and analytically augmented scale of precision. In this case, opportunity journalism continues to perform the civic function of informing the public and adding complexity to the discourse and relational, governance, and societal protective functions.

By integrating technological advancements with a humanistic approach, the symbiotic news ecosystem acquires adaptive inductive ability to ethically and socially traverse and respond to evolving conditions, allowing it to go deeper into the dimensions of the evolving conditions.

3 Technology Acceptance Model: From Tool Adoption to Ethical Challenges in the News Industry

3.1 Ethical Complexity in Newsroom Technology Adoption

This situation counts AIGC tools' potential gains in efficiency as less important than the new losses these tools would create. Journalists are not asking whether AI can do something in less time. Instead, they are asking whether an automated system can do such activities, and more importantly, whether it should. Automated systems are capable of drafting articles, summarizing events, and generating headlines. Who is blamed for the inaccurate content attributed to these articles? Would an AI-generated article to the same standards of ethical reasoning a human-made article would comply with? How can we, as a society, trust the content they consume when they don't know whether it was created by an author or generated by an AI tool?

Using the new rules and regulations AIGC tools can bring about challenges beyond the simple question of productivity. Journalists are not asking, can an AI do something fast enough, but should it do so? The growing automation of writing, summarizing, and title generation, raises issues of responsibility for the generation of false information. Does a machine written document have the same moral agency, if any, as a document written by a human? What happens to trust of the audience if they cannot tell the difference between a human written text and a machine generated one?

Someone hold the journalists accountable. Writing is only one of their tasks. They also have to monitor what content gets published. AIGC is an issue because of this. What gets published? Is it responsible? Is it professional? There is little to no concern for ethics or absence of ethics when it comes to tech integration. They utilize the new tech. This also applies to journalism. There are almost no models that lack the ethics integration.

Interacting with AIGC (Artificial Intelligence Generated Content) technology involves much more than simply accepting a new challenge. A full set of considerations must be made as the operational risks are counter balanced with the advantages of the technology in question. In the case of technology integration in journalism, the ethics surrounding such a situation must be deeply understood. Driven, trustworthy journalism is not an achievement to be maximized, but rather a principle to be upheld.

3.2 The AIGC Adoption Equation: A Model of Trade-offs

The study of the adoption of AIGC in the journalism industry requires examining factors beyond the traditional measures of efficiency and usability, as journalism, unlike other fields, rests on normative principles—honesty, responsibility, and trust within the society—and we

argue for an expanded and multidisciplinary version of the behavioral intention model that would incorporate other dimensions of technological acceptance, in particular, the subtleties of the acceptance of technology in the fields of journalism and communications ethics:

$$BI = \beta_1 \cdot PU + \beta_2 \cdot PEOU - \beta_3 \cdot PR + \beta_4 \cdot PT + \beta_5 \cdot SN + \varepsilon$$

In this equation:

BI (Behavioral Intention) represents the likelihood that journalists will adopt AIGC tools in their professional workflow.

PU (Perceived Usefulness) reflects the degree to which AI is seen as improving task performance, such as accelerating article drafting or summarizing large datasets.

PEOU (Perceived Ease of Use) indicates how intuitively journalists can learn and operate AIGC tools without additional cognitive burden.

PR (Perceived Risk) encompasses possible repercussions of misinformation, mistakes, unintended bias, and ambiguous reasoning in algorithmic output.

PT (Human–AI Trust) refers to the assumption that AI applications will behave within the parameters of journalism ethics and will be free of hazards in the editorial process.

SN (Subjective Norms) concerns individual adoption, peer expectations, and the values of the newsroom and organization.

ε captures contextual variations and other factors that may not be included.

The Building of the given equation characterizes adoption as a balanced trade-off equation instead of a binary one. This encompasses trade-off considerations relating to operational gains, the contribution of ethics, the social barrier, and the enduring social barrier. Where the weighing of editorial responsibility and the audience lie, a trade-off option perceived as beneficial and simple to implement gets overshadowed by a social barrier associated with high contextual risk, or the deficit of a social organizational trust. A case in point is a robust AIGC system, which may be opposed because an AIGC system may be undesirable to some journalists because it lacks adherence to the fundamental principles of the journalism profession.

The model outlines the perspectives journalists hold on the ethical and technical complexities tied to metric innovation with regard to each of the challenges. For journalists, the use of AI in the newsroom goes beyond functionality; it touches on issues of trust and professional credibility and the ethical facets of socially responsible journalism.

3.3 From Efficiency to Distrust: Perceived Risk and Human-AI Trust

The most pronounced issues regarding AIGC in journalism involve heightened perception of risk (PR). Automated AI journalism tools improve productivity; however, many journalists still insist on their principles, especially in situations where there is no tangible output, or the output is difficult to justify. AI hallucination is the generation of uninterpreted coherent text. It is even more problematic when the text is contained in a news story. It is more than a technological problem. It is an existential problem for journalism. When there is no trust If a news report contains false or misleading information, journalism itself collapses. Credibility is lost, trust is broken, and critical erosion of societal values follows.

Open AI's technology lowers journalists' confidence as they take more risks. A very effective i e. tool will not be very effective if the user does not comprehend how or why the system reached a certain answer. This opaqueness particularly disrupts fact-checking. An ethical disruption stems from the lack of understanding of the AI system, especially on the user, journalists. Journalists hold liability and reputational risk for the content they publish. However, they cannot take content that they do not understand or control.

Moreover, imbalance in data sources or cultural insensitivity may cause content generation systems to resort to biased algorithms that create content infused with systemic bias in contradiction to the journalistic values of equity, balance, and representative inclusion, and, even more concerning, may often persist unrecognized and unaddressed, left to the 'random' behavior of the moderation systems.

As PR goes up and human-AI trust (PT) goes down, this indicates a deeper issue, not just a shallow one. A tool can be very useful and easy to use, but if it is a black box and untrustworthy, it will not be used. Black box tools can lose trust by simply performing well and fast. Black box tools can gain trust by demonstrated aligned values, transparency and accountability and the trust of the newsroom.

In order to engage potential adopters, newsrooms should concentrate on improving AI functionalities, but also on creating systems that journalists can interrogate, critique, and comprehend. Flexible, user-friendly, and fact-tracing design systems can enhance PT and reduce PR. In an industry that values accountability and truth, trust is something that should be earned rather than given.

3.4 Role Anxiety and Social Norms in AI Collaboration

Apart from the issues of deadlines and ethics, a large portion of the integration of AIGC in journalism is concerned with psychological and cultural issues, particularly the professional self and the changing functions of the newsroom. As AI moves from being a simple instrument to an interpartner, many journalists face the existential dilemma: If AI writes the story, what is left for me to do? Am I an author? Or, merely a supervisor?

The extended technology acceptance model includes subjective norms (SN)— the expected social pressures, peer actions, and self values internalized by individuals through the social response model towards technology. In a newsroom, depending on the cultural framing of AI, SN may positively or negatively influence adoption. If AI is culturally viewed as a potential danger to creativity, authorship, or employment, any skeptic perceived efficiencies will dominate. On the other hand, the assimilation of AI as a partner that enhances (and does not supplant) human skill will result in significantly higher levels of acceptance.

The worry of de-skilling also explains certain role anxiety. Journalists fear that major reliance on AI will erode their competencies in writing, editorial critique, or even investigative acuity. Such fears, however, appear not to be unsubstantiated. AI writing headline, constructing narratives, or performing initial fact-checking leaves little for humans to do other than passively validate input— unless this role is clearly recommitted.

The anxiety is compounded by what your peers feel and think. Younger members of the team may realize the potential of AIGC Tools but when older reporters of the team exhibit AIGC Tools reluctance and resistance, they all refrain from using the technology. Attitudes and emotional atmosphere of the newsroom is just as important as their AIGC Tools familiarity and technological readiness.

To overcome this challenge, newsroom leadership has to section off some time to help reframe the journalist’s identity. We need to think of human-AI collaboration as a step forward in authorship rather than a step backward. The de-framing of role anxiety and turning to the subjective norms into a positive driving force on culture requires training programs, guidelines for collaboration, and acknowledgment of AI-assisted work as legitimate journalism.

3.5 From Model to Ecosystem: Rethinking Ethical Governance

The AIGC News Production Adoption Model encompasses the consideration and integration of both technology and ethics (as illustrated in Figure 2), however, in comparison to previous

technology adoption models, which purely focus on the operational functionality of a given technology and/or the ease of use, this model encompasses a greater understanding of the factors concerning the field of journalism, which include the interlinked and complex relationships of trust, innovation, responsibility, and accountability.

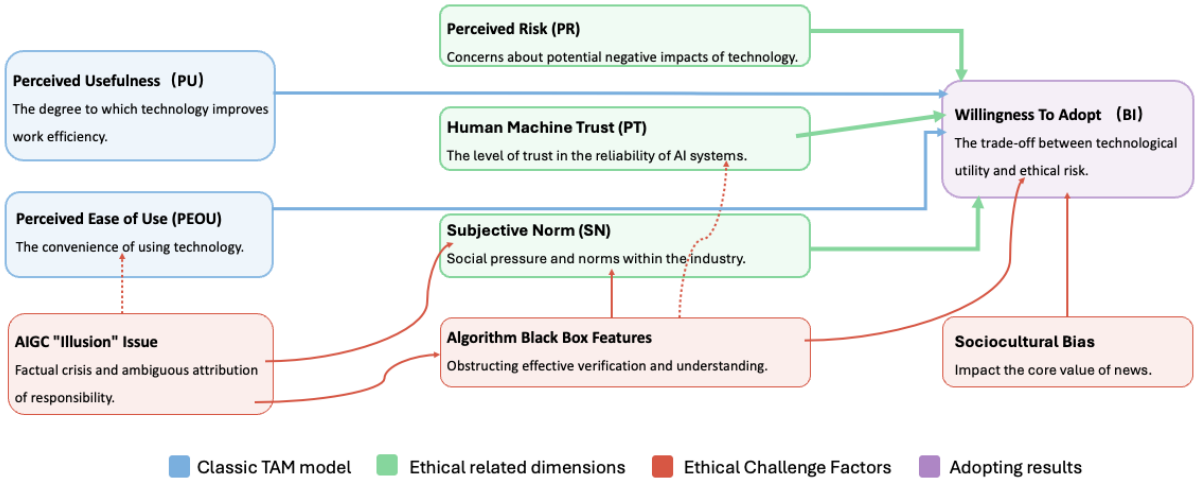

Figure 2: AIGC News Production Adoption Model

Managing AI in journalism extends far beyond a few technical considerations or a compliance checklist. Fully incorporating AI into newsrooms demands a change in thinking. The cognitive routines of a whole organization need to be transformed. Journalists cannot simply learn to use AI tools; they must learn how to manage, critique, and ethically engage with the output of algorithms. This calls for a change of perspective. Instead of considering AI as a neutral tool, we should treat it as a partner. Its contributions should be evaluated, contextualized, and critiqued.

To aid this transformation, ethical governance needs to operate on three interconnected levels:

Technical Design: Systems need to be explainable, transparent, and accountable. AI-informed journalists will evaluate the output, gain credibility, and align with the purpose.

Collaborative Protocols: More attention should be given to the boundary regulations of human editorial oversight. Newsrooms should create clear organizational systems that establish the terms and workflows of human intervention, provide different degrees of automation for machines, and promote transparency and responsibility throughout the production process.

Organizational Culture: The most important thing to evaluate in the newsroom is culture. For organizations, the acceptance of culture and understanding for the development of an organization is important, as is the incorporation of AI to not be seen as a threat. The improvement of journalism should be viewed positively, not the incorporation of AI in work processes as the opportunity to reduce the workforce through automation.

When these three levels create a responsive feedback loop, the conditions for collaboration become sustainable. AI does not substitute for human editorial judgment; rather, it becomes an extension that amplifies the response time, output, and sustains an ethical approach.

The focus is not on the automation of journalism but on creating a model in which humans and AI work together in a symbiotic relationship with the fundamental and the technological values of journalism.

4 Toward Multidimensional Synergy: Governance Pathways for Human-AI Collaboration

4.1 Technical Governance: Improving the Transparency and Control of AIGC

Tech governance has created collaborative frameworks for the human–AI partnership. This further supports the need for AIGC systems to adapt to the transparency demands of AI governance. Responsible AI systems incorporate fact-checking and source tracing, as well as track-audit-manage systems for metadata. Misinformation and hallucination risks will persist in content generation processes without these strategies.

Analysts have developed numerous frameworks for explainable AI (XAI) and continue to do so. XAI frameworks help journalists visualize and comprehend a systems output and various pathways (e.g. logical path, semantic mapping, confidence scoring), which assists journalists in evaluating and building trust in AI's output, as well as understanding the ethical concerns surrounding the content. This also aids in moving from active editorial control to passive editorial control.

This level of governance has a positive effect on efficiency in governance which can be represented in the function:

$$G_e = f(\text{Tech\_g}, \text{Inst\_g}, \text{Edu\_g}$$

In this case, Tech_g refers to the mastery of tech governance. When the design of a system includes transparency, auditability, and controllability, AI can become a partner you can trust, rather than just a tool for productivity enhancements.

Thus, the limits of technical governance must go beyond the standard efficiency framework to also include the safety, interpretability, and various other positive and negative value aspects. Systems must be built in the spirit of the journalists' protective public interest mission to keep the truth, monitor the powerful, and safeguard democracy's liberal expressive protective freedoms. Without technical transparency, other governance forms, be institutional or pedagogical, lack the ethical value foundational pillar. From this perspective, the lack of explainability is indeed troubling, given that it is a necessary condition.

4.2 The Scope of Institutional Governance: Boundaries and Responsibility Systems

The engine of innovation is technology but the sets of interaction parameters are institutional. In the case of AIGC in journalism, the governance institutions intertwine technology and ethics. Unlike in the technical side, e.g. systems design and architecture, institutional governance possesses the systems design. What is lawful and what shall be allowed? Who shall be responsible and who shall be held answerable? What is the acceptable risk and what safeguards shall be instituted?

Setting achievable expectations is imperative when exercising control over the institutions in question. There needs to be standards regarding the relationships entities and decision makers have with AI outputs, uses, and future plans with human editors. The combination of different systems of editorial control and human involvement, be it separation systems, transparency controls, and AI-human output annotation interspersed editorial systems, heightens audience confidence. Requirements of human judgment on large outputs minimize the threat of an editor-less system being instituted, and an automated system being used to take over.

The contribution of human accountability to the silos of governance puzzle is as insightful as it is essential. It tells us that regardless of the amount of AI-generated content or AI-assistant tools employed, human editors will always be liable for the final product (quality, mistakes, inaccuracies, etc.), which positively addresses concerns for journalists, and provides a legal/ethical cushion in the event of errors or falsehoods. Accountability, in this case, is further justified owing to the more elaborate structures of the governance silos that provide systems for auditing, corrective editing, and ethical compliance.

This component of governance is designated as Inst_g, indicating the depth, cohesion, and scope of the norms on the policies and structures of the institutions. High values of Inst_g suggest the organization or the regulatory framework has developed, sophisticated, and integrated policies on the governance of AIGC, as well as the policies that are integrated with the processes and ethical practices of journalism.

No conceptual framework can function in a vacuum. For resilient and flexible human-AI collaboration frameworks to function, institutional governance must engage systemically with Edu_g and Tech_g. Defining borderlines and the attribution of responsibilities for institutions reduces operational uncertainty and enables journalists to interact transparently and ethically with AIGC. This allows institutions to safeguard the sanctity of the newsroom while engaging with the risks and benefits of smart technologies.

4.3 Educational Governance: Empowering the Human in Human-AI Collaboration

Technology does not only influence the work of journalists as passive consumers; they influence it themselves as well. Hence, the capacity, literacy, and confidence of the practitioners are developed through educational activities. In the case of educational governance, journalists are prepared to move from the position of traditional content creators to AI partners and managers. This assumes the acquisition of practice in prompt engineering, model output assessment, some content editing, and baseline algo literacy. AIGC systems teach journalists how to instruct, edit, and configure AI outputs. In the G_e = f(Tech_g, Inst_g, Edu_g), it is Edu_g that isolates the contribution of the educational systems to the phenomenon of AI-integrated journalism. Technology and policy mean nothing without skilled people. Journalism schools need to incorporate data ethics, AI governance, and interdisciplinary training. Education, especially in algorithmically challenged fields, provides an anchor to professional identity, re-establishing for the practitioners what is central to their work—human judgment.

4.4 Tridirectional Coupling: Building a Closed-Loop Governance Ecosystem

Let Tech_g, Inst_g, and Edu_g represent technical, institutional, and educational governance, respectively, and G_e = f(...) denote the nested interdependent functions of governance. Given the symbiotic relationship among all the variables, the interdependent functions of governance must be performed and optimized simultaneously. From a technical standpoint, the functions of governance must result in compliance; from an educational standpoint, the functions of governance must equip individuals with necessary skills to implement the policies and the associated technologies. Institutional explainability, then, closes the educational investment loop; without institutional governance, the policies and the technologies remain unresponsive. The system simply does not function. For equilibrium to exist, collective systemic trans-sector inter collaboration must be structured and put in place involving technical specialists, media and policy integrators, educators, and primary decision making journalists. Ed stagnation will

be mitigated through the combinatory design of educational resources, collaborative governance "labs," and the operationalization of co-governance on AI content. For the enduring human-AI journalism ecosystem, the G_e function requires equilibrium of the variables. Governance effectiveness requires systemic, not additive, change.

4.5 Toward Symbiosis: Redefining News through Human-AI Collaboration

Rather than envisioning the future of journalism as being fully automated, it involves a human-machine partnership, where the AI takes care of retrieving information, writing analytics, and summarizing everything, while the journalist takes care of the meaning, the ethics, and the relationship with the audience. This is not a division of labor, but a division of complementarity. AI does not eliminate human agency; it amplifies it. The objective of G_e = f(Tech_g, Inst_g, Edu_g) is not to simply enhance efficiency; it is to foster adaptive, ethical intelligence in the journalism ecosystem. Such a system has journalists as the logic supervisors and co-authors of the story. The rest of the system has to safeguard the ecosystem's public value. The future of journalism, in the name of accountability, transparency, and education, will most likely encompass a partnership with AI. The departure from control to collaboration is equally indicative of a positive change in professional identity. The thoughtful integration of these changes is how journalism will endure in an era of adaptive systems.

5 Conclusion

The research outlines the challenges of news production in the context of human-AI collaboration. It also outlines an AI integration model in journalism and discusses some of its practical implications. The paper proposes a model with three tiers to address the varying degrees of advancements in AI integration at different levels of the human-AI collaboration framework. In this model, AI starts as an instrument for completing basic tasks and then advances to a fully-functioning partner and, in some cases, an independent agent. To broaden the perspective of the integration of AI into the process of news production, this paper proposes the Degree of Human-AI Collaboration (C) to serve as an index of the extent to which human control and oversight are exercised over the production process and its components as executed through automated systems.

In recent years, technological advancement in the newsroom has made positive impacts but has also raised deeply institutional and ethical concerns. When deploying AIGC technologies, the ethical implications extend well beyond the technical integration and include attention to fabricated details, diffuse accountability in authorship, and displacement in the role of the practitioner.As AI continues to take on more responsibilities in storytelling and editing, both the value and the limitations of the specific role AI is playing will continue to be called into question. The relationship between the journalist and the AI has shifted from the AI being a dominant tool, to a more ambiguous and stuck partnership. In the context of the disruptions, this informs a governance framework that is integrated and three-dimensional in the sense of the technologies, the institutions, and the education. In the case of AIGC systems, technology needs to advance in a way that opaque black boxes become transparent white boxes that are journalistic, auditable, and explainable. For AI to be integrated into a newsroom, at the very least, there should be systems of verification and fact-checking, traceability, accountability, and the other undocumented attributes.

Prior to specific entities having a consistent response, a number of overarching regulations

will need to be made in relation to the entities themselves. Examples include the creation of consistent marking policies regarding AI-generated content, a system for the handling of reviews, and more defined responsibilities. The frameworks will need to be prescriptive while also giving the journalist the primary control over the content.

Educators anchor this triad for governance in the long term. Journalists must advance past simple content production and become AI collaborators, learning the algorithms, prompt engineering, output evaluating, and editing. This speaks to the necessity of journalism education to attend to data literacy, algorithmic ethics, and the management of AI to prepare hybrid professionals for the emerging media ecosystem.

Most importantly, even if computers might not substitute journalists, the range of most jobs will expand, concentrating on new tasks. This will be the case because the new computer- and AI-driven world will alter how tasks are completed. As journalists assume greater value in AI's procedural workloads, computers will be viewed as dependable custodians of social value.

AIGC innovations can improve journalism’s function in truth telling, accountability, and deepening democracy while innovation and ethics are kept in balance. Preserving the human side of journalism AIGC can focus on public interest rather than efficiency.

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