

AI in semi-automated journalism: a review of Indonesia's journalistic ethics

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Abstract In the past five years, Artificial Intelligence (AI) has entered Indonesian newsrooms, aligning with the rise of Industry 4.0. This integration is poised to redefine the roles of journalists and media professionals in the future. Semi-automated journalism, a blend of human journalistic practices and AI technology, is being used in newsrooms to create news content. However, it faces challenges such as accuracy, ethics, and concerns about bias. This article uses a comprehensive literature review, covering academic publications and industry reports from the past five years, to examine semi-automated journalism in the AI era, with a focus on journalistic ethics. The review includes sources selected based on relevance, credibility, and contribution to the topic. The findings identify specific challenges such as the need for transparency in AI processes, potential biases in algorithmic decision-making, and the impact on journalistic integrity. While AI can improve efficiency, it falls short in content quality. It is crucial to train journalists for responsible AI use. Ethical principles should guide AI use in journalism to ensure the provision of quality and valuable information.

Keywords: artificial intelligence; journalistic code of ethics; semi-automated journalism

INTRODUCTION

Indonesia, as a strategically positioned archipelagic nation, boasts a large population with a rich diversity of cultures and local wisdom. Furthermore, Indonesia's economic growth has been steadily increasing year by year (BPPT, 2020). Presently, Indonesia finds itself in the era of Industry 4.0, where the backbone of this industry is interconnected, widely spread, and continuously developing automation technology. This technology significantly impacts the production of various products and industries (Chiappelli et al., 2020).

Hence, Indonesia has many opportunities in the use of Artificial Intelligence (AI) because this technology has the potential to enhance business productivity, human resource utilisation efficiency, and innovation in sectors such as finance, health, education, agriculture, defence and security, transportation, and maritime (Javaid et al., 2022). Artificial Intelligence is a field in computer science that aims to create intelligent machines capable of performing tasks that generally require human intelligence (Dhiman, 2023).

AI systems can learn from experience and improve their performance over time without needing to be explicitly programmed (Janiesch et al., 2021). AI has become the leading technology in recent years, with advancements in machine learning, natural language processing, computer vision, and robotics. New technologies related to AI and data sources are often used to understand, evaluate, and address social problems worldwide (Abebe & Goldner, 2018).

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In Indonesia, the adoption of AI in media is emerging as a transformative force (Asif Khan & Author, 2024). Indonesian media outlets increasingly implement AI for various purposes, including automated news generation, audience engagement analysis, and content personalisation (Safira, 2024). For instance, several news organisations are using AI algorithms to optimise news delivery and tailor content to reader preferences, reflecting a growing trend toward digital innovation in the media landscape (Chan-Olmsted, 2019). This adoption is part of a broader move to enhance operational efficiency and maintain competitive advantage in a rapidly evolving industry.

Comparatively, other countries have been more proactive in integrating AI into their media sectors. In the United States, AI technologies have been extensively employed to automate news production, enhance investigative journalism through data analysis, and even combat misinformation (Broussard et al., 2019). The UK has also seen significant AI adoption, with AI tools being used to produce data-driven journalism and enhance user experience across various media platforms (Simon, 2024). These countries' experiences highlight the potential of AI to revolutionise journalism and media practices, offering valuable lessons for Indonesia as it continues to expand its AI capabilities in the sector.

AI also has a significant impact on the field of journalism. This technology can strengthen and enhance various aspects of news production, such as data collection and analysis, fact-checking, content creation, and reader experience personalisation (Ali & Hassoun, 2019). This technological innovation, known as automated journalism, is a relatively new phenomenon in computer-based journalism (Graefe, 2016).

With all these new technologies, one of the important decisions that entrepreneurs and media executives may have to face is whether to build, buy, or partner with others to use AI (Hansen et al., 2017). Like it or not, AI will enter the editorial space. Implementing AI tools in the media will continuously and systematically change the work of journalists and media professionals in the coming decades (Tessem et al., 2024).

Peña-Fernández (2023) identifies the main social and epistemological challenges arising from the acquisition of AI in media. Gorp and Opgenhaffen, cited in Peña-Fernández's article, mentioned that the technical process of AI has entered the media routine for the last five decades, both in supporting processes and editorial content automation. With AI and machine learning systems, AI applications such as ChatGPT OpenAI, Bing chatbot Microsoft, and Google Bard are slowly being used in the journalism process (Arguedas & Simon, 2023). These AI applications have the potential to help with various tasks, such as information retrieval, data retrieval and classification, and translation. AI can be a useful tool for journalists (Dhiman, 2023).

Concerns about the complete replacement of human journalism by AI cannot be fully confirmed at this time. The nature of AI still requires human intervention (Mele & Russo-Spena, 2021). This journalism process that still requires humans is called 'Semi-Automatic Journalism' by Opdahl (2023). Journalists and editorial staff will manage the semi-automatic process by combining pre-prepared components for information gathering, predictions, and other journalistic tasks. There will be risks where there are wrong processes in the automation process. There will be additional work to learn which processes need to be automated and which ones need to be improved by human capability (William et al., 2023).

Not only providing equipment but there is also a moral obligation to train journalists and other editorial staff in using AI responsibly. This effort, without forgetting the AI itself, can be expensive. Although investment may not be an issue for large news organisations such as Kompas, Media Indonesia, and Tempo, this still requires adaptation that, if calculated materially, will not be cheap especially if this is experienced by the editorial room for smaller companies with more limited resources.

Collaborating with research institutions, education, and academic researchers can be a good way for news organisations with limited resources to start using AI in their newsrooms (Simon & Fernanda Isaza-Ibarra, 2023). However, the culture in the newsroom and the academic world are very different. Many of the norms of journalistic ethics may not be fully understood by academic researchers, and the same applies to journalists who do not understand the ethics and norms of research reviewed by the academic world (Hansen et al., 2017).

The main concern among journalists working with AI is the accuracy results that cannot reach 100 percent. Because sometimes, the verification discipline that is often done by human

journalists is neglected when news is produced by AI journalism (Ariestyani, 2019). Especially for issues that require specific handling and generally, besides having global standards, but also have local wisdom. This article will also highlight how artificial intelligence can help journalists and avoid potential violations of journalistic ethics in Indonesia.

The integration of AI into journalism presents both opportunities and challenges. While AI offers the potential to enhance productivity and innovation within the industry, it also raises significant ethical considerations that need to be addressed (Khogali & Mekid, 2023). This article seeks to investigate the impact of AI on journalistic practices in Indonesia, with a particular focus on adherence to ethical standards outlined in the Journalistic Code of Ethics. The objective is to examine the ways in which AI can be leveraged effectively while maintaining accuracy, fairness, and respect for privacy.

One of the core principles of journalistic ethics in Indonesia is accuracy (Mulkan, 2011; Zuliati, 2024). Journalists are expected to rigorously verify the information they report. However, the use of AI in journalism introduces the risk of overlooking this discipline. AI algorithms, despite their capabilities, are not infallible and may produce inaccurate information, especially in contexts where local nuances are crucial (Bacher, 2024). This issue raises several questions: How can journalists ensure that AI-enhanced reporting maintains the same level of accuracy and reliability as traditional methods? What strategies can be implemented to prevent AI from introducing biases or inaccuracies into news content?

Additionally, the Journalistic Code of Ethics in Indonesia, as established by the Press Council, emphasises truth and fairness (Sugeng & Hadinata, 2024). In the context of AI usage, there is a pressing need to ensure that algorithms do not produce biased or misleading information (Tavares & Ferrara, 2023). This study aims to explore how journalists can integrate AI tools into their workflows while upholding these ethical standards. What measures can be taken to ensure that AI does not replace the essential role of journalists in interpreting and analysing information? How can AI be used responsibly to avoid privacy violations and harm to individuals or groups?

The Journalistic Code of Ethics in Indonesia sets forth ethical and professional standards that journalists must follow (Sulistyowati, 2004; Yulastuti Sahan, 2019). Key principles include accuracy, fairness, and respect for privacy. While previous studies have highlighted the importance of these principles in traditional journalism, there is a gap in the literature regarding their application in the context of AI.

A more robust review of relevant studies and theoretical frameworks is necessary to contextualise the research. This involves examining how AI impacts journalistic integrity and exploring potential solutions to address ethical challenges. The study will incorporate theories of media ethics and technology adoption to provide a comprehensive understanding of AI's role in journalism.

Integrating Artificial Intelligence (AI) into journalism is not a straightforward endeavour but one that demands a thoughtful and nuanced approach to ethical considerations (Opdahl, Tessem, Dang-Nguyen, et al., 2023). As the role of AI in media grows, journalists face the imperative task of ensuring that these advanced tools do not undermine the core values of accuracy and fairness that underpin their profession (Dörr, 2023).

One of the foremost challenges is ensuring algorithmic reliability. AI algorithms, despite their sophisticated design, are not infallible (Sachoulidou, 2023). They require rigorous testing to confirm that they generate information that is both accurate and free from bias. Journalists must recognise the inherent limitations of AI tools and use them as aids rather than replacements for human judgement. These algorithms must be viewed as supplements that enhance, rather than replace the human element in journalism (Gutierrez Lopez et al., 2023).

Equally important is privacy protection; the deployment of AI in newsrooms brings with it a responsibility to uphold the privacy rights of individuals and groups (Porlezza, 2023). Journalists must vigilantly ensure that AI-generated content does not infringe upon privacy or cause harm. This means scrutinising the data collection and analysis processes to safeguard against any breaches that could impact personal privacy.

Moreover, maintaining transparency about the use of AI in journalism is vital. Readers deserve to know how AI tools are employed in the creation of news stories (Kuai, 2024). Journalists should openly communicate the role of AI in their reporting processes, thus demystifying the technology and reinforcing trust with their audience (Darda et al., 2023). This

transparency helps demarcate the boundary between automated assistance and human editorial input, clarifying the sources and methodologies behind the news.

Comparatively, other studies such as Pavlik's (2023) exploration of generative AI's implications for journalism and media education shed light on collaborative potentials, especially in educational settings. Similarly, Amponsah and Atianashie's (2024) broad review of AI in journalism globally contrasts with this study's focus on Indonesia-specific challenges and ethical dilemmas. Henestrosa et al. (2023) delve into audience perceptions of AI-generated content, while Moravec et al. (2024) delve into broader socio-economic and technological influences on AI's role in journalism. Caswell's work (2024) on AI language models complements this study's discussion on AI applications like ChatGPT in news production, reflecting the evolving landscape of journalism. Duncan's (2023) emphasis on ethical journalism and trust resonates with this study's call for responsible AI use and maintenance of ethical standards.

In essence, this research significantly contributes to addressing the nuanced challenges and opportunities that arise in the realm of AI-driven journalism within Indonesia. It underscores the necessity of maintaining ethical considerations, transparency, and trustworthiness to uphold journalism's credibility and integrity amidst rapid technological advancements.

The study is designed with clear, specific objectives aimed at exploring both the benefits and obstacles associated with integrating AI into Indonesian journalism. It seeks to understand how AI can be effectively incorporated into journalistic workflows while adhering to the ethical standards established in Indonesia's Journalistic Code of Ethics. This includes a deep dive into the critical ethical considerations and potential risks linked with the adoption of AI technologies in the field.

To guide this research, the research is anchored by several key questions. First, it investigates how AI can enhance business productivity and spur innovation within the Indonesian journalism sector. This involves examining the ways in which AI can streamline processes, improve efficiency, and introduce new opportunities for creative storytelling and reporting.

Second, the study addresses the ethical dilemmas that journalists face when integrating AI tools into their work. This encompasses a range of concerns, such as ensuring accuracy in AI-generated content, mitigating bias, and preserving the core values of journalistic integrity. The research delves into how these ethical issues can be navigated to maintain the trust of the public and the integrity of the journalism profession.

Additionally, the research emphasises the importance of aligning AI-generated content with Indonesia's Journalistic Code of Ethics. It highlights the need for transparency and accountability in journalistic practices, ensuring that AI applications do not undermine the fundamental principles of truthfulness and fairness in news reporting.

Lastly, the study seeks to identify best practices for training journalists and editorial staff in the responsible use of AI technologies. It aims to provide guidelines on how to effectively incorporate AI tools into daily operations while upholding high ethical standards. This includes developing training programs that equip journalists with the skills necessary to use AI responsibly and make informed decisions about its application in their work.

By addressing these research questions and objectives comprehensively, this article aspires to offer a holistic view of AI's impact on Indonesian journalism. It aims to furnish practical guidelines and actionable insights that can guide the ethical and effective implementation of AI tools in newsrooms across the country. The goal is to ensure that technological advancements serve to enhance, rather than compromise, journalistic values and standards, thereby fostering a journalism landscape that is both innovative and principled.

METHODOLOGY

This research employs a literature review to explore developments in semi-automatic journalism within the context of artificial intelligence, following the state-of-the-art review approach as outlined by Grant and Booth (2009). While literature reviews are typically broad, the state-of-the-art approach focuses on recent advancements and emerging trends, making it particularly suitable for examining contemporary issues in rapidly evolving fields (Passavanti et al., 2023).

The primary objective of this literature review is to map out the current landscape of semi-automatic journalism as influenced by artificial intelligence technologies. By concentrating on the latest developments, this review aims to identify key trends, challenges, and research

gaps that are pertinent to the field. This focus allows the review to provide a comprehensive overview of recent advancements and highlight areas that require further investigation.

State-of-the-art reviews are valuable for offering new insights into a field and guiding future research directions. This approach consolidates recent research findings into a cohesive overview, thereby facilitating a deeper understanding of the subject without requiring readers to sift through numerous individual studies (Thayyib et al., 2023). It is particularly beneficial for those new to the field or seeking to identify current research opportunities.

However, the state-of-the-art review approach has limitations, particularly about its temporal scope (V. Kumar et al., 2023). As artificial intelligence continues to advance, the review may only capture a snapshot of the field at a specific point in time, potentially omitting more recent developments. Despite this limitation, the expertise and experience of the authors contribute to a unique perspective on the topic, offering valuable insights into the intersection of semi-automatic journalism and artificial intelligence.

To ensure the credibility and integrity of the review, findings are analysed using the Journalism Code of Ethics in Indonesia. This ethical framework provides guidelines for maintaining accuracy, fairness, and responsibility in journalism (Saragih, 2023). By applying these criteria, the review assesses the ethical considerations of the reviewed articles, including the accuracy of information, balance of viewpoints, and commitment to public interest. Adhering to these ethical standards is essential for maintaining the research's reliability and credibility.

RESULTS AND DISCUSSION

Artificial Intelligence (AI) has the potential to revolutionise human life and work by automating tasks and processes, improving decision-making, and enhancing overall user experiences. However, there are also concerns about the impact of artificial intelligence on jobs, privacy, and ethics (Hermansyah et al., 2023). As time progresses, the use of artificial intelligence becomes more widespread and massive. It is a certainty that individuals and organisations need to understand the technology and its potential implications (Hirsch-Kreinsen, 2023).

There are several research studies on the use of artificial intelligence in the world of journalism, such as those conducted by Dhiman (2023); Hansen et al (2017); Kumar & Gouda (2020) a Peña-Fernández et al (2023). Some of the main findings are the use of artificial intelligence for: automated news writing, fact-checking, news personalisation, content recommendation, and audience analysis. The use of artificial intelligence in journalism has the potential for benefits and challenges (Anshari et al., 2023).

Although it can improve efficiency and enhance user experience, the other side of the coin of artificial intelligence use also raises concerns about ethical issues. These include the quality and accuracy of automated news writing and the potential for biased content and job loss. Research by Dhiman (2023) indicates that the use of artificial intelligence in journalism can help automate the work of editors by 9%, and reporters by 15%.

Semi-automated journalism refers to the combination of human journalistic practices with artificial intelligence technology to produce news content. It involves the use of artificial intelligence tools and algorithms to assist journalists in various aspects of the news production process, such as data collection, analysis, fact-checking, and content creation.

With advancements in AI, machine learning, and natural language processing, semi-automated journalism emerges to enhance efficiency and productivity in newsrooms (Hansen et al., 2017). Artificial intelligence algorithms can be trained to process large volumes of data, extract relevant information, identify patterns and trends, and generate news reports or summaries based on predefined criteria.

According to Graefe (2016), in the future, journalism will be closely integrated and form a relationship referred to as the 'human-machine marriage'. According to this view, artificial intelligence will analyse data, find interesting stories, and provide initial drafts, which will then be enriched by journalists with deeper analysis, interviews with key sources, and behind-the-scenes reporting. Journalists will also take on a new role in the news production automation process. Graefe cites an example of a new role at the US News Agency, Associated Press, which employs an automation editor. This editor's job is to identify internal processes that can be automated.

Like it or not, there are elemental weaknesses in AI-based journalism products in 2024. Based on the author's experience and interactions with colleagues, journalists generally assess

the quality of automated content writing as low or, to some extent 'good enough'. There are human advantages highlighted when viewing AI-based journalism work as a competitive advantage of humans over machines.

This has also been recognised and experienced by the author when using various AI-based applications, such as ChatGPT or Google Bard. However, according to Weischenberg (2012), writing is not one of the most important skills in a journalistic process. Other factors such as objectivity, simplification, and speed are crucial, and artificial intelligence can be used as part of this complex conventional journalistic process.

Despite these applications, the problems inherent in AI-based journalism include a lack of nuance and contextual understanding, which often leads to oversimplified narratives and factual inaccuracies. This can undermine the credibility of news organisations that rely heavily on AI for content creation. Moreover, the impersonal nature of AI-generated content may fail to engage readers on an emotional level, reducing the overall impact of the journalism.

The use of AI in journalism actually began with the adoption of quantitative journalism forms. This model began to complement what Maier (2002) called the two traditional elements in journalism, namely text and visual. According to Maier, these numbers have long had a role in journalism, but journalists (especially in the United States) consistently ignored them in shaping their professional skills. However, the integration of AI into journalism has made quantitative analysis more accessible and integral to the journalistic process.

The implications of these weaknesses are significant. They highlight the necessity for journalists to refine their skills in areas where AI falls short, such as critical thinking, ethical decision-making, and in-depth reporting. This will ensure that human journalists remain indispensable in delivering high-quality, nuanced, and contextually rich content. Additionally, news organisations must invest in training their staff to work alongside AI, leveraging its strengths in data processing and speed while mitigating its weaknesses in judgement and creativity. By doing so, the journalism industry can harness the benefits of AI without compromising on the core values of accuracy, fairness, and responsibility.

Later, the disregard for facts revealed by Maier made it difficult for journalists to present numerical data accurately and responsibly. In the past few decades, the data-driven journalism types have become more prominent with the spread of information that is more evenly distributed through digitisation, both personal and public information (Caitlin in Maier, 2002).

These forms of data-driven journalism include computer-assisted reporting (CAR), data journalism, and computational journalism (Coddington, 2015). These three forms of quantitative journalism approaches are characterised as related yet different approaches in integrating open-source values with professional journalistic values, each of which actually has its own weaknesses but ultimately provides its distinctive contribution to contemporary journalistic practice. The use of technology will help journalists in their own way to do their work more efficiently.

According to Kumar and Gouda (2020), the use of artificial intelligence in journalism practice has several advantages. First, artificial intelligence has overcome some contemporary journalism problems such as the ability to analyse data from various sources. In addition to analysing images, they can convert spoken words into text and text into audio and video. Artificial intelligence is also expected to be able to overcome the problem of lack of information and poor data journalism.

The use of artificial intelligence also has the potential to produce poor journalism or sloppy journalism (Osoba & Welser IV, 2017). This is driven by the ease of semi-automation that makes humans no longer interested in instilling the human values that have been the norm of conventional journalism.

According to Ganguly (2022), there are several strengths and weaknesses in the use of artificial intelligence in journalistic coverage. Information technology through artificial intelligence has opened the door for journalists to use automatic visual forensic tools in collecting and analysing digital evidence. There are several applications such as Google Reverse Image and TinEye as supporting tools.

These applications automate manual processes and facilitate image verification, while for moving visuals or videos, applications like InVID, can help identify the source and context of the video used. However, despite these advantages, it should be noted that visual forensic tools do not always provide perfect completeness and searches using Google Reverse Image will not always be 100% accurate.

In the search for human identities, artificial intelligence-based applications such as Pipl can facilitate the process by providing contact information from various sources. However, human judgement is still inseparable in the use of automatic people search tools. These tools have certain limitations, especially in the search for personal identities. Human judgement is still needed to narrow down search results effectively. Applications like this can find someone's name, even their phone number, email address, Facebook, Instagram, and other personal data. However, despite all these conveniences, human judgement remains crucial in the search for human identities. An effective search for someone's identity involves a combination of automatic tools and human judgement to achieve accurate and relevant results.

For other automatic data mining, there are several weaknesses to consider. One of them is the high prevalence of false positives in automatic tools used for data mining or information collection. In Ganguly's research, false positives refer to incorrect results or findings given by algorithms or artificial intelligence systems. In the context of data mining or information collection, false positives can mean getting irrelevant data or inaccurate information. This can disrupt efficiency and hinder the investigation process.

One of the reasons for the emergence of false positives is the complexity and diversity of data faced by artificial intelligence algorithms. Sometimes, algorithms cannot perfectly distinguish between correct and incorrect data. This can lead to errors and false positives. In facing this situation, journalists must use human judgement to verify and validate the results given by artificial intelligence algorithms. Although automatic tools can help process data quickly, the final decision still needs human judgement and intelligence.

As one of the most popular platforms in the use of artificial intelligence, Google's data bank is often used because of its universal availability and coverage. However, according to Ganguly's research, Google is considered to provide information asymmetry, due to the limitations of coverage and updates of images and data. This can result in information gaps for journalists who are covering areas or in languages that are less represented by these artificial intelligence tools.

Google, according to Ganguly, collects a large amount of data from various sources, including news articles, websites, and user behaviour. This data can be analysed and used to generate artificial intelligence-based information. As one of the largest technology companies, Google has access to significant data, which potentially leads to monopoly control over the spread of information. This can affect the diversity and variety of news sources, as well as influence the visibility of certain information. Algorithms may not always interpret data correctly or may lack the critical thinking and contextual understanding that humans possess. This can lead to errors, bias, or inaccurate representations in the information generated.

Data monopoly is a significant concern in intellectual-based AI journalism (Stucke, 2017). Large technology companies like Google and Facebook control vast amounts of data, posing challenges for journalists. To navigate this, journalists need to develop skills in using AI tools outside these tech giants' ecosystems, fostering a more balanced and unbiased information environment.

Policies and regulations are essential to ensure fairness and transparency in data access. Such frameworks should democratise data access, preventing monopolies from stifling investigative journalism and supporting smaller media outlets.

Data monopolies restrict access to critical data, limiting the depth of journalistic inquiry and potentially introducing bias into AI tools. This concentration of data control also hampers information freedom, making it harder for journalists to conduct thorough investigations.

Addressing these issues requires journalists to diversify their AI tool usage and robust regulatory frameworks to ensure equitable data access. This approach can help journalism harness AI's potential while maintaining an open and democratic information ecosystem.

The challenges posed by AI in journalism require a comprehensive approach that emphasises responsible AI use while safeguarding the integrity of the profession. A key aspect of this is the collaboration between AI and human knowledge. AI should support rather than replace journalists, with human oversight providing critical judgement, ethical decision-making, and cultural context. Journalists can utilise AI for tasks like data collection and analysis, while they focus on creating nuanced, in-depth stories that resonate with the communities they serve.

The combination of AI's data processing capabilities with human local knowledge is vital. AI may be excellent at identifying patterns in large data sets, but it cannot fully grasp the cultural,

social, and historical contexts that local expertise provides. Human insight is essential in interpreting and analysing data more accurately, ensuring that the human factors that influence lives are considered. By integrating AI with human local knowledge, journalists can uncover deeper, more meaningful stories and avoid potential misinterpretations that could arise from relying solely on AI.

Several strategies can be implemented to ensure the effective integration of AI and human knowledge. First, training journalists to work alongside AI tools while honing skills in critical thinking, investigative reporting, and ethical reasoning will maximise AI's strengths, such as speed and data analysis, while compensating for its shortcomings. Additionally, AI systems should be developed to respect and incorporate local cultural and social insights by involving local experts in the training process. This will ensure that AI tools do not perpetuate misinformation or cultural biases.

Clear ethical standards must guide the use of AI in journalism, including transparency in how AI-generated content is produced and a commitment to avoiding biases. Developers should continue to refine AI algorithms to improve their understanding of context and reduce inaccuracies. Furthermore, regulatory frameworks are necessary to ensure equitable access to data and prevent monopolies by large tech companies, which would otherwise limit the diversity and robustness of investigative journalism.

Media organisations should also be educated on the potential limitations and biases of AI tools to ensure responsible use. By diversifying AI tools beyond major platforms like Google, journalists can avoid information gaps and asymmetries, fostering a more balanced approach to news reporting.

Incorporating both AI's efficiency and human local knowledge will lead to more comprehensive storytelling, preserving the accuracy, relevance, and contextual richness that are the hallmarks of responsible journalism. By embracing this collaboration, journalism can adapt to the changing technological landscape without compromising its ethical and professional standards.

The development of artificial intelligence technology has had a significant impact on various sectors, including journalism. In the use of artificial intelligence in journalism in Indonesia, journalists must still refer to the principles and articles of the Indonesian Journalistic Code of Ethics. Although artificial intelligence can provide assistance and efficiency in the investigation and analysis of information, ethical principles must still be applied to maintain the integrity and quality of the information conveyed to the public.

The application of artificial intelligence in journalism requires journalists to adhere to the ethical principles set forth in the Indonesian Journalistic Code of Ethics. In Article 2, it is mentioned the importance of ensuring that the algorithms of artificial intelligence systems used are not biased and do not change the meaning of the news. This is also related to Article 3, particularly journalists must avoid manipulation or distortion of results that change the meaning of information.

The information conveyed must also be useful and meet the public interest. This is regulated in Article 4 which requires journalists to protect the public interest. In addition to protecting the public interest, journalists must be careful in collecting and using personal data and comply with privacy rules in data collection through artificial intelligence as regulated in Article 5. This directly also makes journalists to be responsible for the information conveyed as regulated in Article 9. In the use of artificial intelligence, journalists remain responsible for the results of analysis and conclusions. The final decision is in the hands of journalists to convey accurate information.

When it becomes a journalistic product, even though it comes from artificial intelligence machines, journalists and media must also provide an opportunity for responses or corrections to the information produced. The principle recorded in Article 10 is essentially to maintain justice and truth in conveying information. And finally, because its application is carried out in Indonesia, in accordance with Article 13, journalists and media that disseminate information based on artificial intelligence must maintain national unity, avoid the spread of fake news and conflict is the responsibility of journalists.

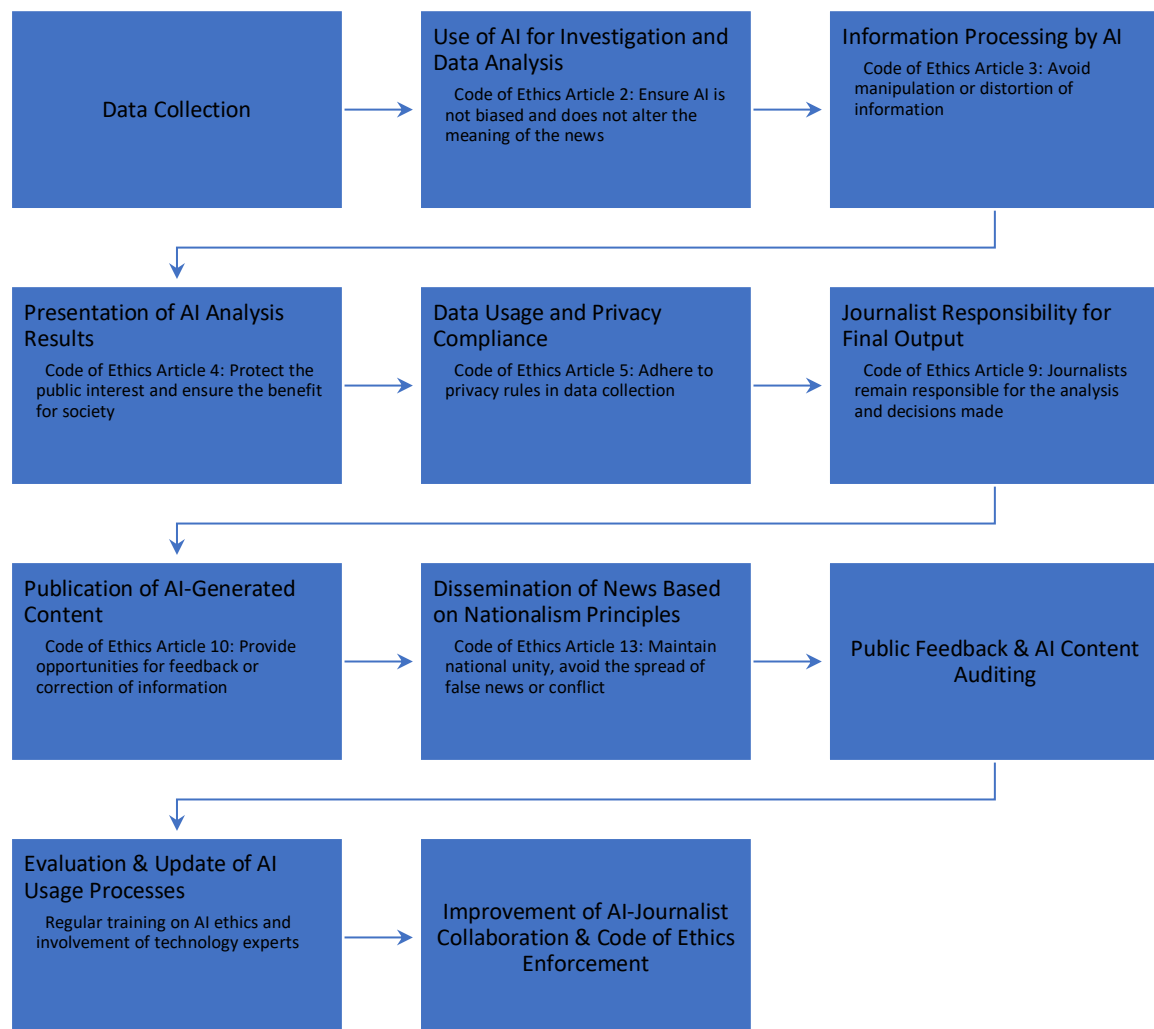


Figure 1. Human-AI collaboration frameworks
Source: Author Data Processed (2024)

The application of artificial intelligence in journalism has significant implications for the ethical principles that must be upheld. Journalists have a great responsibility to maintain integrity, accuracy, and public interest in using this technology. First, maintaining integrity is an important aspect in the application of artificial intelligence in journalism. Journalists must ensure that the algorithms of artificial intelligence systems used do not sacrifice professional integrity. The information produced must reflect honesty, objectivity, and independence, which are the core principles of journalism.

Second, information accuracy must be a priority in the use of artificial intelligence. Journalists must ensure that the algorithms of artificial intelligence systems used provide accurate results and do not contain bias. This is important to prevent distortion or manipulation of information that can change the original meaning of a news article. Accurate journalism is a strong foundation for building public trust.

Third, public interest must always be the top priority in the application of artificial intelligence. Journalists must ensure that the information produced by artificial intelligence systems meet the needs and interests of the public objectively. The results of analysis generated by artificial intelligence must be beneficial to society and provide a better understanding of an event or issue being discussed.

Finally, ethical principles are guidelines that must be strictly adhered in applying artificial intelligence in journalism. Journalists must adhere to ethical values such as honesty, responsibility, privacy, and protection of individual rights. The use of artificial intelligence must

be done with careful consideration to avoid negative impacts and maintain the professional integrity of journalists.

Regular ethics training should be provided to make this more practical in newsroom operations and journalism studies, emphasising AI's ethical use and potential dilemmas. Establishing clear AI ethics guidelines ensures transparency and accountability in AI-generated content. Developing human-AI collaboration frameworks helps balance AI's data processing capabilities with human journalists' critical thinking and ethical decision-making (See Figure 1).

Regular audits and audience feedback mechanisms can help identify and address biases or inaccuracies in AI-generated content. Incorporating AI case studies into journalism curriculum provides students with practical insights into ethical implications. Collaborating with tech experts ensures AI tools align with journalistic ethics and public interest.

By integrating these strategies, newsrooms and journalism educators can responsibly and ethically use AI technologies, enhancing journalistic quality and credibility while upholding the profession's core values.

CONCLUSION

Changes in the application of AI in journalism should start with establishing clear and comprehensive ethical guidelines. As technology advances, it is crucial to formulate specific guidelines for AI use, especially to address issues such as bias, transparency, and accountability. The initial step in this process is to conduct a thorough examination of how AI can be integrated into journalism without compromising existing ethical principles.

Next, research should focus on how the media industry can adapt to these technological advancements. This includes exploring the broader impact of AI on journalism jobs, such as shifts in roles and responsibilities. Studies should also assess the extent to which AI tools can enhance journalistic processes, both in terms of efficiency and quality.

Additionally, a key focus should be strategies for media organisations to integrate AI into their workflows while maintaining journalistic integrity and public trust. By adopting a comprehensive approach, future research will help ensure that AI technology not only strengthens the quality of journalism but also upholds ethical standards and relevance in Indonesia's evolving media landscape. In summary, changes should occur in formulating ethical guidelines and adjusting the media industry structure to effectively and ethically accommodate these technological advancements.

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