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Abstract

The rise of digital media and new technologies has fundamentally changed news gathering, allowing journalists to gather, analyze and share information with unprecedented speed and accuracy. This article explores the integration of tools such as artificial intelligence, machine learning and data analytics into journalism, improving the ability to process large data sets, identify trends and verify information - critical to combating disinformation. We explore the role of social media in real-time newsgathering and the ethical implications of using advanced technologies. Digital tools increase the speed and reliability of reporting, increase transparency and public trust. Our empirical research includes analysis of case studies of major news organizations that have integrated these technologies. A mixed-methods approach is used: qualitative data from in-depth interviews with reporters and editors, and quantitative data on news speed, audience engagement, and information accuracy before and after technology adoption. This article highlights both the practical applications of new technologies and the challenges of news gathering. It includes case studies and recent examples of journalistic practice. While these advances offer significant benefits, they also require new skills and ethical standards for journalists to effectively navigate the complex digital landscape. This research contributes to the debate about the future of journalism in the digital age and offers recommendations for media organizations to integrate new technology into their news gathering processes.

Keywords: Digital Media, New Technologies, News Gathering, Artificial Intelligence, Machine Learning, Data Analytics, Journalism, Disinformation, Social Media, Ethical Implications, Real-Time Reporting, Transparency, Public Trust, Case Studies, Mixed-Methods Approach



1. Introduction

Research on the impact of digital media and new technologies has a long tradition. For decades, one of the most popular ideas in journalism literature is the notion that technological advancements have a transformative effect (Anderson, Bell, & Shirky, 2014; Diakopoulos, 2019). Recent theoretical developments have revealed that the integration of artificial intelligence, machine learning, and data analytics into journalism significantly enhances the ability to process large data sets, identify trends, and verify information (Schapals & Schaewitz, 2019; Broussard, 2019). This constitutes a relatively new area which has emerged from the confluence of journalism and technology (Stray, 2020).

In the past several decades, digital tools have played an important role in news gathering, enabling journalists to gather, analyze, and share information with unprecedented speed and accuracy (Thurman & Walters, 2019; Wu, Tandoc, & Salmon, 2019). There are growing appeals for leveraging these advanced technologies to combat disinformation (Hermida & Kleis Nielsen, 2020). This field of study deals with the integration and application of new digital tools in journalism, which is critical in improving the speed and reliability of reporting, as well as increasing transparency and public trust (Diakopoulos & Koliska, 2019; Beckett, 2011).

This study is motivated by the need to understand the practical applications and challenges of new technologies in news gathering. It therefore analyzed the role of social media in real-time newsgathering and the ethical implications of using advanced technologies (Lewis & Westlund, 2015; Jones & Jones, 2020). Our empirical research includes analysis of case studies of major news organizations that have integrated these technologies. A mixed-methods approach is used: qualitative data from in-depth interviews with reporters and editors, and quantitative data on news speed, audience engagement, and information accuracy before and after technology adoption (Wenzel, 2020).

The aim of this work is to develop a comprehensive understanding of the integration of new technologies in journalism. This research contributes to the debate about the future of journalism in the digital age and offers recommendations for media organizations to integrate new technology into their news gathering processes (Fink & Anderson, 2015; Carlson & Usher, 2021).

This research, which is supported by LPDP (Indonesia Endowment Fund for Education Agency) as the funding body, explores the transformative effects of digital media and new technologies on journalism practices.

2. Related Work

The integration of digital media and new technologies into journalism has been the subject of extensive research in recent decades. This section reviews the previous literature and highlights the main contributions, limitations and gaps that this study aims to address.

Previous Literature

The literature review shows that the development of technology has significantly affected journalistic practices. Previous research has shown that the introduction of artificial intelligence (AI), machine learning (ML) and data analytics tools has transformed the

processes of news gathering, reporting and distribution. Several researchers have made significant contributions showing that these techniques improve the ability to process large amounts of data, identify trends, and authenticate data effectively.

When exploring new sources of news, it has been found out that social media being one of the tools, are vital in real-time collecting of news. The effects of such tools have been explained by various theories, while some of them relate mainly the effect to speed in delivery, others are related to the content of the news. This has been in several occasions applied in the research aim to determine the extent to which technology has influenced the fight against disinformation.

Past research has demonstrated that the use of AI and ML can enhance the verification process in journalism by a great deal. These tools', various research indicate that these tools assist the journalists to detect the false information more efficiently, thus boosting the credibility of the news reports. Following, there are several questions closely related to the focus on ethical issues of high technology in journalism.

Limitations of Previous Research

There are several unresolved questions related to the ethical implications of high technology in journalism. A closer look at the literature on AI and ML in journalism, however, reveals a number of gaps and shortcomings. Most studies have relied on theoretical frameworks and have not provided empirical evidence from practical applications within news organizations.

Previous studies by different authors cannot be regarded as definitive because they largely limited their scope to certain kinds of media organizations, for example, print or Internetbased ones. In the present studies, few cases of ethical problems like privacy, security, and bias found in AI algorithms and the solutions are not vast and do not include various fields of journalism. Secondly, even though the literature has established the significance of using the new technologies, none of the existing studies has provided a detailed analysis of how it influences speed and accuracy of news reporting.

3. Methods

3.1 Research Design

This study examines the impact of digital media and new technologies on news gathering using mixed methods. The research combines quantitative data from a structured survey and qualitative data from in-depth interviews. This design allows for in-depth analysis of both statistical trends and personal opinions of media professionals.

3.2 Participants

The participants in this study are professionals working in various capacities in the media industry. These roles include reporters, editors, reporters, news writers and other similar positions. Participants were drawn from various types of media organizations, including print, broadcast (TV/radio), digital/online, and independent.

4. Data Collection

4.1 Survey

The quantitative data was collected through an online survey, which consisted of several sections:

Section 1: Demographic Information

- **Primary role in the media industry:** Reporter, Editor, Journalist, News Writer, Other
- Years of experience in journalism: Less than 1 year, 1-3 years, 4-7 years, 8-10 years, More than 10 years
- **Type of media organization:** Print, Broadcast (TV/Radio), Digital/Online, Freelance, Other
- **Primary focus of reporting:** Politics, Business, Technology, Health, Entertainment, Sports, Other

Section 2: Usage of Digital Tools

- Frequency of using digital tools (1 = Never, 5 = Always):
 - Social Media (e.g., Twitter, Facebook)
 - Data Analytics Software (e.g., Google Analytics, Tableau)
 - Artificial Intelligence (AI) Tools (e.g., natural language processing, machine learning)
 - Sentiment Analysis
 - Content Creation (e.g., automated writing tools)
 - Trend Analysis (e.g., identifying trending topics)
 - Verification Tools (e.g., Fact-checking websites, reverse image search)

Section 3: Impact of New Digital Technology in News & Media

- Extent of agreement with statements (1 = Strongly Disagree, 5 = Strongly Agree):
 - Digital tools have increased the speed of my reporting.
 - \circ Digital tools have improved the accuracy of my reporting.
 - \circ $\;$ Digital tools have made it easier to verify information.
 - Influence of data analytics on information verification before publishing.
 - Impact on audience engagement.

Section 4: Ethical Implications and Challenges

- Ethical concerns regarding advanced technologies in journalism: Privacy Issues, Data Security, Bias in AI Algorithms, Transparency, Disinformation, Other
- Preparedness to handle ethical challenges: Not prepared at all, Slightly prepared, Moderately prepared, Very prepared, Extremely prepared
- Training or resources needed for better integration of new technologies: Workshops/Seminars, Online Courses, In-house Training Programs, Mentorship/Guidance from Experienced Colleagues, Other

Section 5: Combating Disinformation

- Frequency of encountering disinformation in reporting (1 = Never, 5 = Always)
- Agreement with statements about combating disinformation (1 = Strongly Disagree, 5 = Strongly Agree):
 - Digital tools have significantly enhanced my ability to detect disinformation.

- AI and machine learning tools are effective in identifying false information.
- Social media platforms are a major source of disinformation.
- Tools used to combat disinformation: Fact-checking websites, AI-based disinformation detection tools, Data verification software, Social media monitoring tools, Other

Section 6: Deeper Understanding

- Descriptions of specific instances where digital tools significantly impacted the newsgathering process.
- Additional tools or resources needed to combat disinformation more effectively.
- Perceptions of the future role of digital tools in journalism.
- Biggest challenges faced in integrating new technologies into journalistic practices.
- Examples of how machine learning has helped identify significant trends or patterns in reporting.
- Effectiveness of AI tools in identifying and combating disinformation, with specific instances.
- Desired improvements or additional features in digital tools used for newsgathering.

4.2 Interviews

The qualitative data was collected through in-depth interviews with a subset of survey participants. These interviews focused on:

- Personal experiences with digital tools in newsgathering.
- Ethical considerations and challenges.
- Strategies for combating disinformation.
- Insights into the future role of technology in journalism.

5. Conclusion

The purpose of this paper is to describe the effects of digital media and new technologies in the process of collecting the news and determine the potential for journalists working in the conditions of the digital society. This integration of the new technology enhances the potential of acquiring, analyzing and transforming information into knowledge and facilitates the recognition of patterns and investigation of data, and hastens and enhances the strategies of reporting. Thus, it can be stated that the given field is rather promising, though there is a long way to go, and it is helpful in the majority of cases.

6. Summary of Findings

It has also been discovered from the survey that the use of digital tools is quite common among media professionals irrespective of their designation. Key findings include:

- 1. **Increased Speed and Accuracy:** Along with the traditional tools, digital tools have greatly enhanced the effectiveness of the news gathering reporting process, through expediting the phase of gathering the information and or data, doing the analytical work and sharing the information with a wider audience.
- 2. Ethical Concerns: The concerns and challenges that journalists encounter in the use of AI including privacy matters, security issues, and bias related to the algorithms used therein (Lewis & Westlund, 2015; Diakopoulos & Koliska, 2019). However, there is a pressing sense that many reporters are ready to confront these concerns though many of them are demanding for more capacity-building (Wenzel, 2020).

3. **Combating Disinformation:** Digital assets have been instrumental in the fight against disinformation since many journalists have been using the fact-checking websites, AI based detection tools, and the social media monitoring tools for substantiating the information and for detecting the fake news narrativesc (Hermida & Kleis Nielsen, 2020; Jones & Jones, 2020).

7. Implications

The outcomes of the current study highlight the beneficial impact of digital media and new technologies in journalism. But these benefits can only be obtained to the fullest if the media organizations that create and circulate content solve the ethical issues and ensure that their journalists are trained and equipped with proper tools. In this way, they can also increase the quality and reliability of the provision of information, increase the transparency, and gain the citizens' confidence (Carlson & Usher, 2021; Beckett, 2011).

It also examines the crucial function of digital aids in distinct forms and as defenses against deception. That said, the following tools have proven efficient during the enforcement of counteracting disinformation Though, it remains an important challenge to fight disinformation on social media. Consequently, the sustained development of advanced verification tools and approaches remains a critical requirement for news organizations' relevance (Hermida & Kleis Nielsen, 2020; Fink & Anderson, 2015).

8. Recommendations

Based on the research findings, the following recommendations are made for media organizations: Based on the research findings, the following recommendations are made for media organizations:

- 1. **Invest in Training and Resources:** Develop a consequential training for the journalists with features such as workshops, online and in-service training programmes to enable them update themselves with the technology and ethical practices (Lewis & Westlund, 2015; Carlson & Usher, 2021).
- 2. **Develop Ethical Guidelines:** Create stiff ethical bounds concerning the application of AI and other digital tools to mitigate issues concerning privacy, security, and fairness of algorithms (Diakopoulos & Koliska, 2019).
- 3. Enhance Verification Processes: Acquire better verification technologies that will enable the fight and eliminating fake news as well as improvements to news reports themselves (Diakopoulos & Koliska, 2019).
- 4. **Foster Collaboration**: Call for convergence and engagement of other relevant stakeholders like journalists/tech people and ethicists to design solutions for the emerging technology problems (Wenzel, 2020).

References

- Anderson, C. W., Bell, E., & Shirky, C. (2014). *Post-industrial journalism: Adapting to the present*. Tow Center for Digital Journalism, Columbia Journalism School.
- Beckett, C. (2011). *SuperMedia: Saving Journalism So It Can Save the World*. Wiley-Blackwell.
- Broussard, M. (2019). Artificial Unintelligence: How Computers Misunderstand the World. MIT Press.
- Carlson, M., & Usher, N. (2021). News for the Rich, White, and Blue: How Place and Power Distort American Journalism. Columbia University Press.
- Diakopoulos, N. (2019). Automating the News: How Algorithms Are Rewriting the Media. Harvard University Press.
- Diakopoulos, N., & Koliska, M. (2019). *Algorithmic Transparency in the News Media*. Digital Journalism, 7(8), 1065-1082.
- Fink, K., & Anderson, C. W. (2015). *Data journalism in the United States: Beyond the "usual suspects*". Journalism Studies, 16(4), 467-481.
- Hermida, A., & Kleis Nielsen, R. (2020). Social Media and Journalism: Trends, Connections, Implications. Digital Journalism, 8(6), 703-709.
- Jones, S., & Jones, M. (2020). Disinformation and Digital Media: The Impact of Algorithms and Automation on News. Journalism Studies, 21(7), 885-902.
- Lewis, S. C., & Westlund, O. (2015). Actors, actants, audiences, and activities in crossmedia news work: A matrix and a research agenda. Digital Journalism, 3(1), 19-37.
- Schapals, A. K., & Schaewitz, L. (2019). Artificial Intelligence in Journalism: Research and Implications. Journalism Practice, 13(8), 975-993.
- Stray, J. (2020). Making Artificial Intelligence Work for Investigative Journalism. *Digital Journalism*, 8(3), 310-330.
- Thurman, N., & Walters, A. (2019). *Live Blogging and Social Media Curation: Challenges* and Opportunities for Journalism. Digital Journalism, 7(5), 629-648.
- Wenzel, A. (2020). *Resisting Reduction: The Role of the Journalism Community in AI and Algorithmic Decision-Making.* Journalism, 21(7), 1028-1044.
- Wu, S., Tandoc Jr., E. C., & Salmon, C. T. (2019). A Field Analysis of Journalism in the Era of Data: Understanding the Practices, Challenges, and Implications of Data Journalism. Journalism Studies, 20(2), 256-273.

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