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Research Article

The Intersection of Technology and Journalism: Exploring the Impact of New Media, Digital Media, and AI on Data and Robot Journalism on the Internet of Things Era

Ahmad Alzubi

University Utara Malaysia; ahmadalzoubi642@yahoo.com



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Abstract. The field of journalism is undergoing a fast transformation as a result of technological advancements such as new media, digital media, and artificial intelligence (AI), all of which are redefining the method in which news is collected, evaluated, and disseminated. This shift has been further hastened by the emergence of the Internet of Things (IoT), which has led to the increased prevalence of data-driven and robot journalism. The purpose of this research paper is to investigate the effects that the recent advances in technology have had on journalism, with a particular emphasis on data journalism and robot journalism. We emphasize the advantages and problems of these new kinds of journalism and give insights into how journalists may effectively adapt to the changing technology environment by drawing on a thorough literature study. In addition, we highlight the benefits and challenges of these new forms of journalism.

Keywords: New media, Digital media, AI, Data journalism, Robot journalism, Internet of Things (IoT), clickbait journalism.

INTRODUCTION

As new media, digital media, and AI continue to transform the landscape of the media industry, the convergence of technology and journalism has been a subject of great debate in recent years (Nguyen & Hekman, 2022). This change has increased with the emergence of the Internet of Things (IoT), resulting in data-driven and robot journalism becoming more widespread (Haleem et al., 2022). Data journalism is the practice of utilizing data to discover and report on stories, while robot journalism is the practice of employing algorithms and artificial intelligence to produce news material. These new kinds of media, although offering a lot of advantages, also create a lot of problems and ethical considerations that need to be addressed. (de-Lima-Santos & Salaverra, 2021) In this research study, we examine the influence that these innovations have had on journalism and give insights into how journalists might adapt to the changing technological world.

In recent years, the practice of journalism has been subjected to substantial shifts as a result of the proliferation of new technologies such as new media, digital media, and AI, which have altered the manner in which news information is produced, evaluated, and disseminated (Lancova, 2023). The development of the Internet of Things (IoT) has further expedited these shifts, making it possible for journalists to collect and deliver news material in ways that are novel and ground-breaking. However, data journalism in particular has been recognized as a key advancement in the industry. In data journalism, journalists use data to identify topics and patterns that may have been overlooked by conventional means of reporting. However, there are problems over accuracy, bias, and privacy that are raised by data journalism. Some people contend that robot journalism lacks the human understanding and analysis that is necessary for great journalism (Wang, 2022; Haddad 2023; Newman, 2023). Robot journalism includes the use of algorithms and AI to produce news material. It has becoming more common.

Many individuals now get their news from social media platforms rather than from conventional news sources (Ahmed, 2021). This indicates that social media has played a key influence in the development of journalism. This has resulted in a democratization of the news, but it has also led to issues over the veracity and impartiality of the information that is presented as news. Moreover, these developments in technology have also had significant effects on the revenue model for traditional news organizations. With the decline of print newspapers and the rise of digital media, traditional news organizations have seen a drop in advertising revenue and an increase in the use of alternative revenue models (d'Haenens et al., 2022). This has led to a rise in the use of alternative revenue models.

In light of these developments, this research article aims to explore the intersection of technology and journalism, with a particular focus on the impact of new media, digital media, and AI on data and robot journalism in the IoT era. The

article will review the existing literature on these topics and will provide new insights and information to further our understanding of these issues. However, By exploring the challenges and opportunities presented by these new technologies, this research article will contribute to the ongoing discussion about the role of journalism in the digital age and will provide insights into how journalists and technologists can work together to ensure that these new technologies are developed and used in ways that support the continued relevance and integrity of the journalism profession.

LITERATURE REVIEW

Extensive research has been conducted and published on the topic of the junction of technology and journalism, with various studies showing both the positive and negative aspects of new media, digital media, and AI. One sub-genre of journalism known as "data journalism" in particular has garnered attention as a potentially useful method for unearthing hidden narratives and gaining fresh understanding of complex topics. On the other hand, it presents issues over data privacy as well as accuracy and bias (Bradshaw, 2022). Robot journalism, on the other hand, has the ability to provide news in a more timely and cost-effective manner, but it also raises questions about the function of reporters and the reliability of news content (Moran & Shaikh, 2022). The underlines the significance of social media in altering news consumption, with many individuals increasingly looking to online social networks for news rather than conventional news sources (Tian, 2022). This shows the importance of social media in shaping how news is consumed.

The influence of technology on journalism has been the subject of a number of studies, many of which have focused on the considerable shifts that have occurred over the course of the most recent few years (Yujie et al., 2022). According to Alzubi (2022), the proliferation of new media, digital media, and AI has given journalists the ability to collect, evaluate, and disseminate news material in ways that are fresh and inventive. Data journalism, in specific, has been acknowledged as a key growth in the profession, with many journalists utilizing data to unearth stories that may have been overlooked by conventional techniques of reporting. This specific development has been identified as a significant advance in the area. Data journalism has been used to reveal patterns and trends in a range of sectors, like politics, economics, and health, amongst others (Appelgren et al., 2019). Data journalism has been used to uncover structures and trends in a number of different fields.

However, problems of accuracy and bias are raised when data journalism is considered. It is possible that data sets are lacking, erroneous, or biased, all of which may lead to incorrect or misleading findings. There is also the possibility that journalists would incorrectly interpret the data or will distort it in order to make it fit a narrative that they already have in their heads, which will result in a lack of impartiality (Appelgren, 2019). In addition, there is a worry over the privacy of data, since there is a possibility that journalists may obtain and analyze data that people would rather keep private (Ekstrom & Westlund, 2019).

Another notable advance in the industry is robot journalism, commonly referred to as automated journalism. According to Peiser (2019), this kind of journalism includes the use of algorithms and AI in order to produce news content.

According to Lermann Henestrosa et al. (2023), robot journalism has been used in the production of a variety of different sorts of material, including news stories, sports reports, and economic information. The use of AI and robotics in journalism has garnered plaudits for its efficacy and low cost, but it also raises worries about the function of journalists and the quality of news material. Some people believe that robot journalism does not have the human insight and analysis that is necessary for effective journalism, and they also believe that it may perpetuate prejudices and preconceptions (Mooshammer, 2022).

The change of journalism has also been significantly influenced by the rise of social media. According to Shearer and Mitchell (2021), an increasing number of consumers get their news via social media platforms rather than from conventional news sources. This has resulted in the democratization of the news, since it is now possible for anybody who has an account on a social media platform to post and distribute news material. However, due to the fact that social media platforms are often used in the dissemination of propaganda and false information (Pennycook & Rand, 2021; Madrid, 2023), it has also given rise to questions over the veracity and impartiality of the news.

According to the findings of the study conducted by Koivula and colleagues in the year 2020, this exemplifies the crucial role that collaboration between journalists and developers had in the development of these technologies. According to Deuze (2019), journalists and technologists need to work closely together to ensure that new technologies are developed with the needs of journalism in mind and that they adhere to the ethical standards of the profession. In order to do this, journalists need to work closely with engineers. On the other hand, technologists need to be aware of the specific needs and challenges that are connected with journalism, and they should work together with journalists to build technologies that are capable of meeting these criteria (Danzon-Chambaud, 2021).

Furthermore, this underlines the huge influence that technology has had on journalism, with new types of journalism such as data-driven and robot journalism becoming increasingly common in this era of the internet of things (Bailer et al., 2022). It is crucial for journalists to adapt to these changes in order to preserve the continuing relevance and integrity of the media profession (Aitamurto et al., 2019). While these new forms of journalism do provide a number of advantages, they also raise a number of obstacles and ethical issues. While these new forms of journalism do offer a number of benefits, they also raise a number of challenges and ethical concerns.

Recent research has also centered its attention on the effects that digital media has had on journalism. The proliferation of digital media has made it possible for journalists to communicate with a more diverse audience and to disseminate news material in novel and creative ways. However, it has also led to questions about the quality of news material, as well as the viability of the economic model for conventional news organizations (Alzubi, 2023; Bossio & Nelson 2021).

(Kenyon, 2022) One cause for concern is the rise of journalism that relies heavily on clickbait. The term "clickbait journalism" refers to the practice of creating news articles with the purpose of gaining clicks and making money, rather than

generating content that is factual and objective. According to Dickinson (2023), the headlines and articles that are utilized in clickbait are often false or sensationalized, which leads to a loss of confidence in the sources of the news and weakens the credibility of the profession. Clickbait is a kind of online advertising.

According to the findings of a study that was conducted in the year 2020 by Zhang et al., the establishment of a clickbait media ecosystem requires taking into account the algorithmic curation of social media structures. In spite of the reality that the practices of clickbait may not be sustainable in the long run, especially for legacy media websites, clickbait continues to be frequently employed. According to Lischka and Garz (2021), our perspective on the distribution of clickbait material is that it is a game of revision with an unknown threshold.

Concerns also surround the effect that digital media will have on the business models used by news organizations to generate income. Traditional news organizations have seen a large loss in advertising income as a result of the advent of digital media and the demise of print newspapers, which has led to budget cuts and layoffs (Grundy, 2022). This has also resulted in an increase in other business structures, such as paywalls and subscriptions, which have proven to be profitable for certain news organizations but have also generated concerns over access to information and the consequences on democracy (Vara-Miguel et al., 2021).

In addition, current research has investigated the use of AI in the field of journalism. According to Lewis et al. (2019), artificial intelligence has a chance to revolutionize the process of producing, analyzing, and disseminating news material. According to Campbell (2021), AI algorithms may be used to recognize trends and patterns in massive data sets, as well as to produce news material that is tailored to the tastes and interests of individual readers. Nevertheless, the use of AI in journalism raises issues about the function of journalists and the possibility of bias in news output. The development of artificial intelligence is having significant implications for both the media's and journalism's ethics. Journalists now have the opportunity to use cutting-edge tools that are driven by artificial intelligence, which enables them to locate and report on news more quickly and accurately. Because AI may help journalists understand more about their audience, they may be able to produce pieces that are more pertinent to their needs. (Frąckiewicz, 2023). However, According to (Meier et al., 2022) One interpretation of this finding is that the convergence between technology and journalism is a field that is undergoing continuous change and innovation. (Dwivedi et al., 2022) New technologies, such as based on data and robot journalism, provide numerous advantages; yet, they also create substantial problems and ethical considerations. As a result, it is essential for journalists, technologists, and other participants to work together to ensure that these new tools are developed and used in a manner that is compliant with ethical standards and that supports the continuing significance and credibility of the field of journalism (Quach et al., 2022).

RESEARCH METHODOLOGY

The paper takes an analytical and exploratory approach to its subject matter. When conducting research and drawing findings, we make use of a variety of themes, including digital transformation, technical improvements, and the behavior of

tourists. In addition, a complete literature analysis consisting of academic articles, industry reports, and news items was carried out by us in order to investigate the influence that these technological changes have had on journalism. The purpose of this research paper is to investigate the effects that the recent advances in technology have had on journalism, with a particular emphasis on data journalism and robot journalism. Drawing from a detailed analysis of the previous research. The integration of technology into every aspect of our life has had an effect on even the most minute aspects of this planet. Technology is increasingly being relied upon by vacationers for all of their information needs as well as decision making. Therefore, it is beneficial for the future of the sector to do research and analysis on the effects of this digitization. In addition to this, the purpose of the stakeholder model for digitalization is to provide a high-level overview of the elements that are playing a significant part in the digitalization of the sector.

FUNDINGS & RESULT

In the era of the internet of things (IoT), the purpose of this research paper is to analyze how new media, digital media, and AI have affected data and robot journalism. Based on the findings of the literature review, it seems that the rapid advancements in technology have made a significant impact on the field of journalism. These technologies have opened up new doors of opportunity for journalists to uncover stories and trends, however they have also prompted concerns around dependability, bias, and security. After completing an analysis of the relevant literature, it became clear that the expansion of data journalism is a big impact area that has to be addressed. Data journalism is the activity of utilizing data to find stories and trends that may have been missed by traditional techniques. This may be done in order to fill in gaps in previously published information. To make journalism better, this approach may be used. According to the findings of the study, data journalism has the potential to make the news media more accessible and relevant to customers while simultaneously providing journalists with new opportunities to uncover stories that wouldn't have been found if they had relied on traditional methods of inquiry (Alzubi, 2023c). The evaluation of the relevant literature, on the other hand, brings to light a number of the challenges that are associated with data journalism. Some of these problems include doubts about the veracity of the data sources, the danger of introducing bias into the analysis of the data, and the need that journalists maintain the knowledge, expertise, and resources necessary to effectively assess and interpret the data.

Another area of impact that was discovered as a result of the investigation into the aforementioned literature is the growing popularity of robot journalism. The process of writing news articles with the assistance of computer programs and artificial intelligence (AI) is referred to as "robot journalism." Despite the fact that some individuals feel that it is essential for outstanding journalism to have human knowledge and assessment, other people believe that this approach has the power to cut costs and boost efficiency in the generation of news, despite the fact that other people believe that it is essential for good journalism to have human understanding and evaluation (Alzubi, 2023b). Having said that, an analysis of the appropriate

literature reveals that there may potentially be significant concerns associated with robot journalism. Concerns have been expressed about the likelihood of bias in the decisions that are made by algorithms, the lack of transparency in the method by which algorithms are designed and implemented, as well as the risk of robot journalism fully substituting the need for others journalists.

The analysis of the corresponding literature also stresses the significance of social media in the development of journalism. Since the advent of social media, anybody with an internet connection may disseminate information and ideas to a global audience. This has greatly contributed to the democratization of the news. The existing literature, however, hints to further major concerns connected to the use of social media for journalism. The potential for the spread of false information, a lack of accountability for users, and the potential influence of social media on traditional media business models are all sources of worry. According to the literature review, the decline of print newspapers and the rise of digital media had a significant impact on the business models of traditional news organizations. This is true for revenue models. The rise of different revenue designs, such as contributions and memberships, has been identified as a potential solution to this problem, despite academic research showing there are numerous challenges associated with such models, such as the need to strike a balance between the need for revenue and the require for objectivity and independence in news reporting. This is now seen as a viable option for fixing the issue. The convergence of technology and journalism has had a profound effect on the industry as a whole, as is abundantly clear. These innovations have opened up exciting new possibilities for journalists to discover stories and reach out to new audiences, but they have also raised serious concerns about dependability, bias, and security. According to the findings, cooperation between journalists and technologists is necessary to ensure that these innovative tools are developed and used in ways that preserve the credibility and viability of the news media. Cooperation might be the key to success here. However, it has been suggested that journalists and technologists work together to build new ethical norms and standards for information and robot journalism, which would help to overcome these barriers. Rules governing the use of AI and algorithms to newsgathering, as well as data quality and transparency benchmarks, might be part of this. It has also been suggested that news organizations diversify their revenue streams and rely less on advertising by exploring other business models like memberships and bundles.

In conclusion, the analysis presented the Overview of the Literature shows not only the significant impact that technology has had on the news industry, but also some of the challenges and opportunities associated with the development of new media platforms. This may be ensured if journalists and engineers work together to establish new standards of ethics and best practices.

DISCUSSION

The introduction and literature review are analyzed to show how data journalism, robotic journalism, and social media have changed the journalism industry. There are growing worries about accuracy, prejudice, and privacy, even as these technologies have opened up new avenues for journalists to find stories and

reach new audiences. The necessity for journalists to acquire new knowledge and abilities is a significant topic of debate in relation to this study. Data journalism, which is on the increase, places a premium on journalists who are proficient in data analysis and visualization tools and can handle large, complicated datasets. To analyze and criticise the work produced by these systems, journalists need a deep familiarity of algorithmic decision making and AI. This study also contributes to the ongoing debate on how traditional media outlets might adapt to the digital era by creating sustainable new sources of income. As readership for hard copies of newspapers continues to fall, media outlets need innovative income streams to stay afloat. The literature suggests that subscription and membership models present significant challenges, such as striking a balance between the need for revenue and the need for independence and impartiality in news reporting. The literature also addresses worries regarding the influence of technology on the quality and veracity of news reporting, in addition to these difficulties. Concerns have been expressed concerning the capacity of technology to promote excellent journalism in light of the proliferation of false news and the possibility of bias in algorithmic decision making. The research, however, also shows that technology may promote improved journalism, for example, via the use of data analysis tools to find new stories and trends.

The creation of new ethical principles and best practices is one approach to addressing problems brought on by the convergence of technology and media. Guidelines for the use of algorithms and AI in the news industry and the establishment of standards for data quality and openness are two possible outcomes of such an endeavor. Furthermore, it is recommended that news organizations put an emphasis on openness and accountability in their use of technology to win over consumers and allay their fears of bias and inaccuracy. The dialogue, though, shows how intricate and diverse the convergence of technology and journalism really is. While these innovations have allowed journalists to expand their coverage and reach, they have also presented them with new issues in terms of objectivity, prejudice, and privacy. Journalists and technologists can guarantee that emerging technologies are created and utilized in ways that uphold the profession's relevance and integrity by collaborating to develop new skills, income models, and ethical principles.

CONCLUSION

The convergence of technology and journalism has had a profound effect on the industry in a variety of ways, the most notable of which are the proliferation of data journalism, robot journalism, and social media. Although these technologies have presented journalists with new chances to unearth stories and communicate with new audiences, they have also given rise to substantial issues around accuracy, bias, and privacy. Journalists and news organizations alike need to work on developing new skills, as well as alternative business models and codes of ethics. This involves the creation of rules for the use of AI and algorithms in the production of news as well as the establishment of standards for the quality and openness of data. In order to earn the audience's confidence, news organizations need to make openness and accountability in their use of technology a top priority. The influence

of technology on the field of journalism is a continuing process, and new technological developments and difficulties appear on a daily basis. For this reason, it is very necessary for news organizations and journalists to have a flexible mindset and an openness to new concepts and procedures. Together, journalists and technologists have the ability to assure that technology will be created and utilized in ways that promote high-quality journalism and the continuing relevance of the profession in the digital era. This may be accomplished by working together. In the end, the capacity of the journalism profession to capitalize on the possibilities and overcome the obstacles given by technological advancement will determine the field's trajectory going forward. By acting in this manner, journalists and news organizations have the ability to assure that they will, in the years to come, continue to play an essential role in educating audiences and engaging them. Aside from the primary inferences that can be formed from the research, there are a few more significant factors that should be taken into consideration in relation to the junction of technology and journalism.

To begin, the proliferation of user-generated content and social media platforms has had a huge influence on the ways in which people make and consume news. Many people now rely on social media platforms as a major source of news, and as a result, news organizations have been forced to adjust their practices in order to accommodate this new reality. One way in which they have done so is by connecting with audiences on social media platforms and by integrating social media information into their reporting. Nevertheless, the usage of social media raises issues over the propagation of false information and the effect of social media algorithms on the consumption of news. Even in the setting of social media, it is essential for journalists and news organizations to be aware of these issues and to take measures to guarantee that their reporting is accurate and trustworthy. As a result, it is essential for these individuals and organizations to be aware of these challenges. Second, the research demonstrates the potential of technology to enable new types of media, such as immersive journalism and virtual reality news. These technologies have the ability to deliver a more immersive and interactive experience for the audience, which will boost their engagement with the news items that are being presented. However, the creation and usage of these technologies also present significant ethical and practical problems pertaining to access, inclusiveness, and accuracy. As a result, it is essential for journalists and technologists to collaborate in order to guarantee that these new technologies are created and deployed in ways that promote the production of high-quality news as well as a wide variety of voices and points of view. Additionally, the convergence of technology and journalism brings to light the significance of education and literacy in regards to various forms of media. It is crucial for audiences to acquire the skills and knowledge necessary to critically analyze and comprehend the information they come across in order to keep up with the ever shifting ways in which technology shapes the production and consumption of news. As a result, it is essential for educators, journalists, and technologists to collaborate in order to establish programs of media literacy that support educated and involved citizens in this age of digital technology. This involves making materials for journalism and media literacy that are of a high quality available to audiences of all ages and fostering

the ability to think critically and analyze information among audiences of all ages. To summarize, the convergence of technology and journalism brings possibilities as well as obstacles for the journalistic profession. Journalists and news organizations may guarantee that they will continue to play an important role in educating audiences and engaging readers by collaborating on the development of new skills, income models, and ethical principles. This will allow them to prepare for the digital era.

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