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Article:	Investigating the Use of Artificial Intelligence in Journalism and its Impact on News Quality in Pakistan
Author(s):	Muhammad Rizwan MS Media Sciences, SZABIST University Islamabad Pakistan
	Dr. Wajid Zulqarnain Head of Department, Associate Professor, Media Sciences Department, SZABIST University Islamabad Pakistan
	Dr. Haroon Elahi Faculty Media Sciences Department, SZABIST Islamabad Pakistan
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Author(s) Note:	Muhammad Rizwan studied MS Media Sciences at SZABIST University Islamabad Pakistan Email: rq0815126@gmail.com
	Dr. Wajid Zulqarnain is serving as a Head of Department & Associate Professor at Media Sciences Department, SZABIST University Islamabad Pakistan
	Dr. Haroon Elahi is serving as a Faculty member at Media Sciences Department, SZABIST Islamabad Pakistan

ABSTRACT

Technology transfer entails the dissemination of innovative technology from one nation or organization to another. This process typically involves the exchange of knowledge and expertise rather than physical hardware, with the primary focus on effectively communicating the underlying mechanisms and designs. Successful technology transfer is contingent upon clear communication, which also facilitates persuading the original technology owner to share their innovations with other countries. Factors such as economic considerations and location feasibility also play a role in technology transfer. Pakistan has yet to fully integrate artificial intelligence (AI) into its media industry. Enhancing communication with countries that possess advanced AI technology, such as China and the United States, could potentially facilitate the introduction of AI-driven journalism in Pakistan. To improve international communication for technology transfer, this study will conduct in-depth interviews with experts in the field, analyzing their insights to develop optimal communication strategies. This research find out the several factors can be effectively contribute the usage of AI in journalism in Pakistan and enhance the news quality.

Keywords: AI, Jouranlism, Pakistan, Newsrooms, News Quality

Introduction

Technology is advancing in all fields rapidly, but one of the most reflective dimensions within the last decade has been the progress of Artificial Intelligence and it's being integrated with various fields. Journalism is one of those emerging fields that are adopting AI technology for various tasks that ease the work of journalists in one or another way. The gadgets and programs that utilize AI are the front players and are playing a developing role in its development, these may include different software that gathers raw data from different sources and convert it into well-structured news form. The advancement of AI in journalism has also led to debates about the role of journalists and the news they write if machines actively perform their tasks and take place in the future. Similarly, thinkers discuss AI journalism as a career and the level of public trust in media companies utilizing AI.

The Artificial Intelligence Strategy states, “Artificial intelligence refers to the ability of machines to perform tasks that normally require human intelligence. The simplicity of this definition confuses a lot of people since it is so clear. But in actuality, this definition is rather close to the ones employed by eminent academics and in a number of authoritative AI textbooks. The first thing to keep in mind about the term is that it covers a very wide range of topics, from developments in recent years to advancements in the 1940s with regard to early electronic computers. The definition of "artificial intelligence" is also subject to constant change. When something is new and interesting, people don't hesitate to call it “artificial intelligence. But once people are aware with the capabilities of particular AI techniques, they are frequently referred to as just "software." We will revisit the subject of how modern approaches to AI differ and why AI technology is at a turning point later in this piece. (Allen, 2020).

There are many different methods of developing artificial intelligence systems, and different methods work in different ways and have different advantages and disadvantages. Many of these techniques fall into two general categories, according to DARPA, a longstanding leader in the field of artificial intelligence research: (1) traditional knowledge and (2) automated learning. Although machine learning systems are relatively new, they have contributed significantly to advances in the capabilities of artificial intelligence in the last ten years. If you've heard of *Understanding Artificial Intelligence Technology* by Gregory K. Allen, Joint Defense Center for Artificial Intelligence some people or companies claim that their systems "use artificial intelligence," what they probably mean is that their systems use machine learning, which remains a problem long before their systems reach independent intelligence equal to or better than human intelligence in all categories. However, recent developments in machine learning are significant and have implications for nearly every industry, including defense and intelligence. The easiest way to understand machine learning systems (Allen, 2020).

Recent discussions about ethics and artificial intelligence systems have tended to prioritize issues that shape hypothetical general artificial intelligence systems in the distant future, such as the emergence of a “singularity” or the development of superintelligence that could pose an existential threat to humanity. (Clare and Barrocas, 2016).

Research Questions

1. What is the extent of AI usage in Pakistani news organizations and the type of tasks that AI is used for?

2. How does AI impact news quality in terms of accuracy, completeness, fairness, and timeliness?
3. What are the potential challenges and ethical considerations associated with using AI in journalism in Pakistan?

Literature Review

Artificial intelligence (AI) represents a major technological breakthrough with the potential to revolutionize various industries such as healthcare, finance, and transportation (Baloch et al., 2024 ; Brynjolfsson and Mitchell, 2017 ; Kshetri, 2018 ; Malik et al., 2019)). . As an interdisciplinary field, artificial intelligence combines computer science, mathematics, and engineering to create intelligent machines capable of performing tasks that typically require human intelligence, such as learning, problem solving, and decision-making (Russell and Norvig, 2010). The origins of artificial intelligence can be traced back to the 1950s, when computer scientists and mathematicians began developing algorithms and models to simulate human intelligence (Nelson, 1998). The first AI systems relied on rules. They used "if-then" statements to make choices (LeCun et al., 2015).

AI in journalism is its potential in the automation of processes for news gathering, writing, and editing, analysis of data for information that may inform news decisions. This paper considers the literature that reviews the current state of research on AI in journalism and the associated benefits and challenges (Baloch et al., 2024).

The main advantages of artificial intelligence in media are time-consuming and repetitive automation of activities. For example, AI could be set to monitor social media and news sources to detect breaking news, thereby saving journalists time and energy (Harcup, 2020). It can also automatically generate stories about sports scores or financial news, giving reporter's time to create more in-depth stories. (Dörr et al., 2020).

Realizing the whole potential of AI in journalism, whilst lessening those challenges, calls for cautious and crucial design of AI, with efforts towards transparency, ethics, and duty of AI systems. In the paper "The Future of Journalism: Artificial Intelligence and the Newsroom," Juho Vesa discusses the capability for artificial intelligence to routinely generate information and the ability effect on journalists and information organizations. Vesa believes that while AI could make information manufacturing extra powerful, it also brings along hazards for the nice and value of the information. He referred to how artificial intelligence algorithms, though able to generate articles, would not have any critical thinking, moral judgment, or humanistic perspective that good journalism requires. Vesa explained how AI could be used in the future to further bias and inequality if algorithms are not designed and tested with caution.

Agnieszka Kitkowska and Tomasz Kitkowski work on the role of artificial intelligence in journalism, more precisely within media products. According to the authors, it would be beneficial to see the possible benefits and challenges related to putting AI into newsrooms; nevertheless, journalists should treat AI as an improvement tool, not a replacement. They indicate that AI can perform tasks, such as the analysis of data and fact-checking repetitively, so more complex and creative tasks will be performed by journalists. The alertness provided by Kitkowska and Kitkowski tends to stand in the way of replacing human judgment or decision-making while using AI in news reporting (Kitkowska & Kitkowski, 2021).

Sanjay Kumar, Manish Kumar, and Rajendra argue about the challenges and ethical issues that surround the use of artificial intelligence in journalism. According to the authors, even though AI has the potential to enhance the efficiency and accuracy of news production, it gives rise to several concerns related to bias and liability and the place of human judgment in news reporting. They note that if AI algorithms are skilled on biased records units, then bias can also emerge as perpetuated; so news organizations have to ensure that their algorithms are obvious, responsible, and open to human scrutiny. Furthermore, they reiterated, it is vital that newshounds be alert and vigilant at the same time as running with AI equipment, and also be aware about the restrictions in them, and even biased results (Kumar, 2021).

These scholars add to the discourse on the opportunities and challenges of integrating AI into the AI of the newsroom including ethical questions in developing and implementing AI programs in the news media Their research is indeed leading that, although AI has many promising applications in journalism and news, it will be important for journalists and news organizations to boundaries Acknowledge that artificial intelligence is a useful tool to grow your business by becoming aware of potential ethical issues and what this technology can do.

Vesa (2020) informed that artificial intelligence is set to influence the future of media. The talk explains the various applications of artificial intelligence, from fact finding and data analysis to product development.. Vesa also delves into the challenges thrown up by artificial intelligence across the news industry with respect to bias and the quest for transparency and accountability.

Kitkowska and Kitkowski (2021) explore th potential of artificial intelligence in journalism, in particular, the use of "robojournalists" to create content, will be dealt with in this volume. In other words, the authors intend to convey the message that AI's ability and inability ought to be understood by journalists and news houses and used responsibly and ethically.

Avere (2020) explores the the impact that artificial intelligence is more likely to make a difference in journalism concerns AI applied for news gathering, content creation, and audience engagement. The authors discuss issues and concerns surrounding the use of artificial intelligence in journalism, including issues of bias, privacy, and human journalists losing their jobs.

M.A., Tariq F. and Khattak H. (2021) study's aimed at establishing the adoption of artificial intelligence within Pakistan's media industry. The research also tried to find out the knowledge and attitude of journalists and media persons about AI journalism. As per research, although the majority of the participants were familiar with artificial intelligence concerning journalism in general, they usually lacked proper knowledge about this technology and its probable applications in journalism. At best, the adoption of AI in the Pakistan media industry is very rudimentary. Most of the media companies currently use AI to perform very basic tasks, like content curation or social media management. The authors conclude that Pakistan needs awareness and training in AI journalism to be increased, suggesting media organizations partner with AI startups and academic institutions to AI newsrooms and other innovative solution development (M.A., Tariq, F. and Khattak, H., 2021).

Salim H. and Kiani S.A. (2021) analyze of the In this backdrop, the role of artificial intelligence in journalism in Pakistan was scrutinized. The probable advantages of AI journalism were explored, which included speedy news production and personalized news content through cost-effective means of news production. The challenges faced by AI adoption

in the country due to a lack of skilled AI professionals were discussed as there exists a general lack of awareness among the journalists and media experts. In view of the critical review of the relevant literature, the authors argue that though AI journalism in Pakistan is at a nascent stage of development, the potential it has for the media industry in the country is huge. It was also recommended that media companies in Pakistan invest in AI technology and work with AI start-ups and universities to find sophisticated solutions for effective and audience coverage they are deeply involved (Salim, H. and Kiani, S.A. 2021).

Salim H. and Arif M. (2021) referred towards literature review on Artificial Intelligence and Journalism in Pakistan. Some of the mentioned benefits that are expected include speed up news production, produce personalized news content, and reduce the cost of news production. The review also centered on the challenges opposing the implementation of AI within the country due to the lack of awareness of the media and its experiences in the Artificial Intelligence News. The researchers concluded that even though AI journalism in Pakistan is still at a development stage, there is a high potential for its future application in the media industry. They proposed that media organizations should collaborate with AI startups and academic institutions to develop AI-enabled journalism, which will enable a significant improvement in the quality of journalism products. Journalism provides innovative solutions to reach and grow audiences (Salim H. and Arif M., 2021).

Evan T.R. and Awan M. (2021) presented a study about the role of artificial intelligence in Pakistani media. They did a content analysis of news bulletins from Pakistani news channels to find out the extent to which artificial intelligence technology is used in news production. The study has shown that while AI technologies are fast finding their place in news production in Pakistan, they are mostly applied to quite simple tasks like curation of content and management of social media platforms. The researcher suggested that Pakistani media organizations make investments in AI technology and work with AI startups and academia to develop innovative solutions that will enhance news content so that consumer interest becomes sticky. They also stressed on the need to train journalists and media professionals in the use of AI technology and develop the requisite skills that are needed to bring out the potential within themselves in the sphere of journalism (Awan, T.R. and Awan, M., 2021).

Theoretical Framework

The theory of innovation proved to be the best option that fulfills the aims and objectives of this study. Diffusion is described as such by (Rogers, 2003):

“It is the method through which an innovation is disseminated over time among the individuals within a social system through certain routes..”(Rogers, 2003)

The terms used in that definition are explained in this section.

“It is a concept, activity, or product that a person or other element of adoption perceives as unique..”(Rogers, 2003)

In analyzing the transmission of innovations, Rogers stresses the perception of newness rather than whether an innovation is actually innovative.

Communication channels are used to spread innovations.

“I is a way for two people to communicate with one another.”(Rogers, 2003)

There are many distinct types of communication channels, and each one may have unique characteristics about how quickly ideas spread through it. However, Rogers first and mainly distinguishes between two different sorts of channels: interpersonal channels and mass

media channels. Messages from a sender to several recipients are transmitted by mass media, including news, instructional content, and TV shows. On the other hand, interpersonal channels exist between people and permit back-and-forth communication.

While social networks play a larger role over time as individuals look to their peers for feedback and evaluations of innovations, mainstream media are still crucial for generating early awareness of innovations.

Time, which regulates the sequence of events, is a key factor in the spread of innovations. The process of diffusion develops throughout time. Time is therefore important when examining how a person or other adoption unit progressively modifies their condition/state and outward conduct. Time is a crucial factor for classifying adopters into distinct groups or figuring out how quickly an innovation is being adopted, or how many people embrace it (Rogers, 2003).

Diffusion study differs between two basic topologies for social systems. Through values, norms, roles, and hierarchies, the social structure affects dispersion. Additionally, the communication structure controls how information may move through the social system, for example, by establishing linkages for communication between people. Both structures are of interest to diffusion researchers due to their effects on the diffusion process (Rogers, 2003).

Methodology

Keeping in view the objectives of this research and after exploring the related literature on this topic and also keeping the inductive approach in mind, the most suitable method of data was Qualitative. The data was collected through semi-structured interviews by the researcher. Purposive Sampling strategy was applied.

In this research following people from different areas, relevant to the research aim, were selected for interviews: five Newsroom Journalists of Pakistan and five researchers of Artificial Intelligence in different universities.

Findings and Discussions:

After conducting indepth interviews of the selected sample it has been found that AI is new for journalists and its usage has not become common so far. As Mohsin Nawaz (Director News ABN Channel) said that currently there is no such use of AI in our newsrooms but the latest software is quite attractive and can be utilized in the future. The Voice apps of AI are very helpful for our field as a lot of time is consumed in it. China and India are working a lot on this and now even they have launched AI news anchors also. Similarly, the post-production work will become much easier with the induction of AI in our newsrooms.

The second respondent Khurram who has been News Assignment Editor for Dawn News and Samaa TV said that first and most urgent task is raising awareness about the utilization of AI in the news rooms. Journalists even don't understand the term AI, it's utilization in Newsrooms is a faraway thing. He said that media houses and educationalists should step forward to collaborate with different institutions to arrange multiple workshops for the journalists so that they are aware of its applications. The third respondent, Taimoor, elaborated on how AI could affect newsrooms, in particular those in Pakistan. It showcases how AI can make news content better and more relevant, but at the same time its usage must be responsible and ethical. He pointed to the successful cases of AI implementation in news organizations around the world like BBC News Lab's Juicer and Reuters' Lynx Insight. The participants recommended that to ensure responsible use of AI, there should be human

oversight, development of policies and guidelines, making sure a team exists consisting of data engineers, scientists, and AI experts. He further suggested that journalists acquire the basics of machine learning and artificial intelligence, learn new updates, and acquire skills relevant to using artificial intelligence technology effectively. The fourth interviewee, Waleed, said that the use of artificial intelligence in newsrooms would bring great impact upon the quality and perception of the news content in Pakistan. Artificial intelligence algorithms can auto-generate news and can even check its authenticity. This can be done to solve a wide-ranging problem of fake news in the country. Checking journalistic accuracy, ensuring inclusivity, and responsible use of data by removing bias from the process of its production can ensure responsible and ethical use of AI. Society cannot close its eyes before the effect of AI, nor can it wish for a new form of public debate that aligns AI technologies with public values and underpins regulatory systems that protect citizens while encouraging innovation. For instance, India's media industry is one of the strongest examples of newsrooms that can succeed in adopting AI to innovate news production, improve accuracy, and engage bigger audiences. In an interview, the impact of artificial intelligence on Pakistani newsrooms was discussed with Assad. Assad is of the view that through artificial intelligence technology, quality and relevance pertaining to Pakistani news content can be enhanced by automating tasks like translation, searching for relevant information, and video editing. He also admitted to the fact that AI cannot fully automate newsrooms, and on the other hand, AI can mislead if some wrong data is collected.

It is to be ensured by Pakistani news organizations that a limit is placed on its use, clearly identifying where AI is used, assurance on privacy and data security, and further validation and balancing AI systems. In this regard, Assad has pointed toward the successful use of AI in newsrooms, like that of the Washington Post's Heliograf and the BBC's AI tool, which suggests news items to users based on their activities. Journalists and newsrooms need basic knowledge of AI, how to collect, process, and clean data for its use, and also knowledge of the impact and limitations of AI.

Technical difficulties and limitations in the implementation of AI use in Pakistani newsrooms are related to financial resources, data availability, and cleansing and, most importantly, the need for a continuously available team of experts to analyze system performance. Assad is optimistic about the future of AI adoption and usage in Pakistani newsrooms because of increasing awareness and interest in AI and technological advancement. In an interview, Shammass shared his thoughts on the adoption of artificial intelligence in Pakistani newsrooms. He added that AI-based fact-checking tools could avail the steps for the fact-checking of any information to the reporters, and hence they will be better placed at efficiently detecting any misinformation or fake news. However, AI integration should complement human judgment and expertise rather than completely replacing it. Ethically using AI in newsrooms would require the establishment of clear ethical guidelines for principles and standards of practice for using AI. Mechanisms should be adopted to eliminate bias and guarantee diverse news coverage. Consider also laws and regulations relating to data protection, privacy, intellectual property, and content moderation.

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