A Survey on Ethical Artificial Intelligence for Journalism: An Innovative Step Towards Digital Cities Infrastructure

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Abstract. Artificial intelligence (AI), it is the technology which uses algorithms, machine learning, and vast amounts of data. It enables machines to learn, reason, problem- solve, and make decisions like humans by machines, especially computer systems. These processes include learning, reasoning, problem-solving, perception, and language understanding. Making sure that AI systems behave morally, responsibly, and in alignment with human values is the goal of AI ethics i.e. Ethical AI. Journalism is the activity of collecting, verifying, and presenting news and information to the public through various media such as newspapers, television, radio, and digital platforms. Traditional journalism refers to the practice of gathering, verifying, and reporting news through established media channels such as newspapers, radio, and television. But when AI is introduced in the journalism domain it will have major positive and negative consequences. Moving towards the Digital cities, focus should be on AI in journalism and getting ready with the changing world of journalism. It will have a great impact on society as well as human beings' day-to-day life. This survey will give insights of Journalism in the AI era. During this journey the world will come across impacts, effectiveness and limitations that can be faced by each one as a reader, policymaker or journalist etc.

Keywords: Artificial Intelligence, AI ethics, Journalism, Traditional journalism, bias

1 Introduction

Journalism joins the audience with the world. It makes sure that people are aware of ongoing events. The events may be related to politics, cultural events or activities, current affairs and social issues, etc. The connectivity is established by various medias such as TV, social media platforms, magazines, newspapers, radio. The main aim of journalism is to supply accurate and timely information to audience. Newsroom is the platform where individuals can exchange their thoughts without having fear or judged by anyone. By this exchange accurate information is spread and correct decisions can be made.

Traditional journalism includes professional journalists. They should be aware of the ethics and rules that need to be followed. It may include fairness, equality and accuracy. News is created by a set of processes. It must follow some predefined sequential tasks.

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It involves data collection, data analysis on gathered data, research with different views, fact-checking, interviews with various stakeholders, and review with editorial board. When these processes have executed successfully, publication or broadcast is coming into picture. This journalism type focuses on reliability and deep reporting. It reduces time requirement to provide with the accurate information to the public. Traditional journalism was playing very important role in manipulating public opinion. It was responsible for making authorities responsible for information provided. The information delivered by traditional journalism was trustworthy because of systematic approach. After introduction of digital media, AI-driven journalism became popular.
After artificial intelligence (AI) was introduced, journalism has changed a lot in all aspects [1–4] Artificial intelligence (AI) techniques are integrated to get various fruitful results. The integration of AI is in multiple forms. In news creation it helps a lot. It analyzes audience views and comments or maybe feedbacks regarding any event. Various techniques are combined together to detect false or incorrect information. News writing and selection is one of the forms of AI integration. AI-driven journalism uses automation processes. It developed multiple algorithms to create news faster. While doing this it takes more data than traditional journalism. It relied on judgments given by human, creativity of them, and manual data collection [5, 6]
To identify many uses of artificial intelligence in today's newsrooms are major goals of this survey. It will also estimate how different technologies can influence newsroom's environment. It analyzes the level of AI-driven research and technology today. By this survey benefits and drawbacks can be easily identified. Due to AI 's adoption various concerns are raised such as bias, accountability, and openness. Further as an effect of these concerns technological, social, and ethical issues is generated [2, 6–10] It gives guidance for future initiatives in ethically sound and fruitful AI-enabled journalism. It is highlighting unexplored research topics and also focuses on areas in need of improvement.

1.1 Technologies Supporting AI-Enabled Journalism

1.1.1 Natural Language Processing (NLP)

NLP makes it possible for computers to understand human language. It will include activities such as sentiment analysis, machine translation, language production, and understanding. It allows cognitive systems to comprehend spoken and written language. Also, it will promote efficient communication between humans and these systems [9, 11, 12].

1.1.2 Machine Learning

Algorithms used in machine learning allow systems to improve over time. Also, it will help to learn from data, and make judgments or predictions without explicit programming. This component is necessary for cognitive processes machine learning algorithms are useful. It will bring out the change and adaption in return with new knowledge [1–4, 13].

1.1.3 Deep learning

It is a subfield of machine learning. It processes data and analyzes it. For analysis artificial neural networks are taken into consideration. It uses several layers of interconnected nodes called neurons to simulate in a similar manner how the human brain learns. Text, speech, and image data are examples of huge and complex data that deep learning excels at handling. Numerous current innovations, including voice assistants, self-driving cars, facial recognition, and language translation, are powered by it. Over the period, it learns better. It will become more accurate as it receives more data over time [1–4, 14, 15].

1.1.4 Generative AI (Gen AI)

Artificial intelligence that can produce original writing, images, music, and code is known as generative AI. It creates unique, human-like outputs. It is using sophisticated models, such as neural networks, to identify patterns in the data that already exist. Examples include ChatGPT for text, DALL·E for images, and tools that make videos or music. Gen AI is having numerous applications such as content creation, designing, education. It can also be used in problem-solving. Using it tasks can become faster and more creative [3, 4, 8, 15].

2 Objectives

The main objective of this survey is to provide a detailed analysis of how Artificial Intelligence (AI) is used to digitize and shape traditional journalism to modern journalism. This transformation can play a major role in digital cities infrastructure development. Also, it should provide content generation, translation, analysis of audience, content personalization, and news analysis along with it. It tries to describes various hurdles to integrate AI. It includes concerns about ethical values, opinions or biasness, transparency, removal of different jobs, and confidence in content generated.

by AI. The study also gives brief idea about research requirements in human–AI collaboration. More focus is given on fairness while doing it, with an emphasis on current AI-driven journalism platforms. It makes recommendations for ethical and human- centered AI models so that they can improve journalism's quality desirability and appropriateness.

Referring both new and established uses of artificial intelligence (AI) in journalism is the main objective of this survey. It evaluates use of AI tools at various stages in the journalistic process. The tools may be generative models, computer vision, machine learning, and natural language processing. These tools are used in integration or individual for different phases of journalistic process. The processes may contain basic news verification as one of the major tasks. Further it leads to content creation based on available data. Finally, audience engagement and translation is taken into consideration.

The survey uses procedures, techniques for businesses. These are the procedures which are used in newsroom. It analyzes scholarly journals containing AI. Now this will give

comprehensive overview of automation process. This complete analysis will describe actually how traditional journalism is changed to AI-driven journalism.
The effects are evaluated under different categories like ethical, social, professional. It can be considered as the scope of this survey. By assessing these issues are identified. The issues may be transparency, bias, accountability etc.
Digital and data-driven journalism are major areas to focus on. Many opportunities are made available by AI technology. The integration of these techniques is helpful in maintaining trust and credibility by audience.

3 Related Work

The survey started with the generalized domain as Journalism. By going through the research papers related to Journalism, basic gap identified as after AI inception in media industry a lot of changes have taken place in newsrooms. Further various benefits are identified as automated content generation, speed improvement, reduced time requirement for news article creation. So, survey papers regarding above benefits are searched. Along with this some more aspects are observed as Audience Analysis and Engagement, personalization etc. But in papers related to this some ethical and privacy related issues have come into picture. In all the above thing AI-driven systems are involved in processing for betterment of the system. Further in more detailed analysis it's cleared that for fact-checking, accountability, transparency, bias like issues human oversight is must. So, started searching for the papers containing human-AI collaboration. Throughout this complete survey all the above benefits and issues are analyzed in more detail for research purpose.
In some of the papers directly the authors have taken interviews, collected data by direct assessment through questionnaires, group discussions etc. In some they have used news datasets, APIs, directly taken it from news channels for further analysis. In summary all the aspects of news domain, its advantages and disadvantages are comprehensively analyzed.

3.1 Automated News Generation

With the help of AI, news articles are generated at very fast speed. The articles may be like event-based articles, fact-based articles, reports of various types and updates regarding sports, finance etc. Due to these errors are reduced, speed is increased. Also, less human power is required. But while storytelling there are some issues. AI cannot totally replace humans as it cannot have some qualities like emotional factor, critical thinking and inventiveness. AI-generated news anchors which uses deepfake technology may have lost human touch to news articles and lifeless news. Machine learning and natural language processing are the techniques which can quickly identify fake news and contents. AI techniques fail to understand complex language, bias, privacy, and transparency concerns etc. The Accuracy-Fairness-Transparency (AFT) framework mentioned in" A data-centric approach for ethical and trustworthy AI in journalism "addresses above issues [16]. By Focusing on data quality rather than quantity will highlight major factor. The factors may be transparent reporting,

impartiality and truthfulness. Human oversight will make sure that the contents are justifiable and responsible. As AI driven systems are mainly dependent on data algorithms avail- able. Human intervention is a necessity for fact checking for the news produced by AI. Finally Automated News Generation by AI-driven systems can improve reporting. Simultaneously human validations should also be there for maintaining trust and accuracy [5, 16, 17].

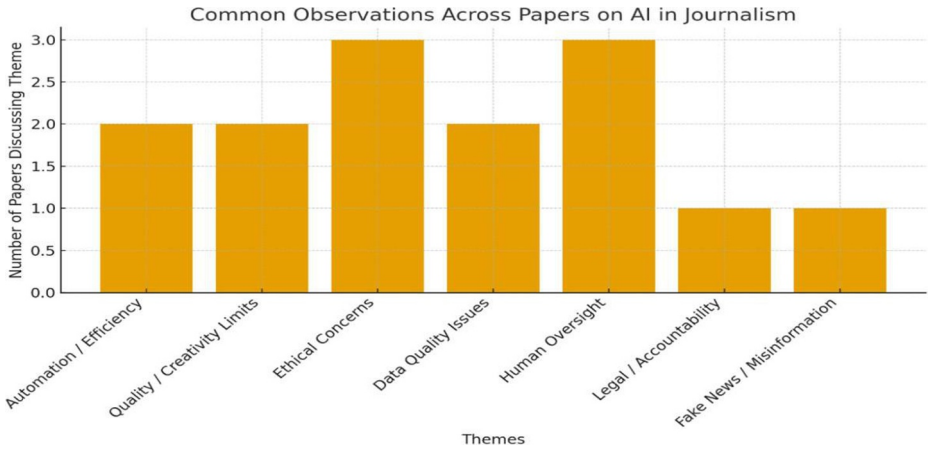

Fig. 1 Observations/issues across Automated News Generation with Human-AI collaboration

3.2 Content Personalization

Excessive use of ChatGPT, Gemini GPT and generative AI tools by journalists for content generation is happening after AI inception in news domain. It's useful in improving quality of news article, personalization of contents. It suggests narration in multimodal

form such as audio, text, video and other online platforms. Creativity and productivity are increased, but on the other hand, issues are raised. The issues include legal and ethical, deepfakes, privacy difficulties, copyright violations, bias in training data, and the heavy job loss. AI literacy is needed to sort these issues. By using accurate and fair rules, algorithms a trustworthy system can be built for journalism. [8, 14].

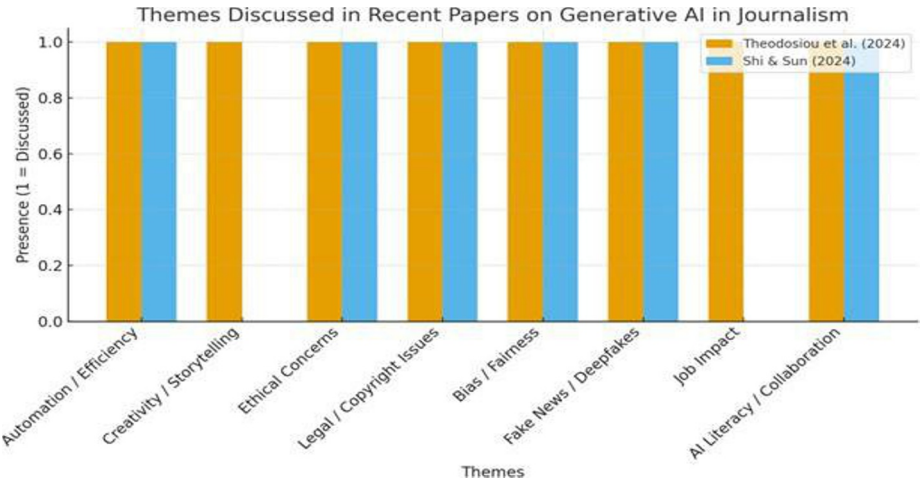

Fig. 2 Observations/issues across Automated News Generation with Human-AI collaboration

3.3 Data-Driven Investigative Journalism

AI can cover topics related to education sector, economic industry, technical development and multiple industrial areas. Journalists use AI to draw information from these fields for generation of news articles based on them. Tools like ChatGPT, Quill-Bot, Grammarly, Google Assistant are taken into consideration for writing and editing the news articles. AI improves various factors but again it raises issues simultaneously. Sometimes human intervention can also add issues like lack of creativity, unclear ownership, a lack of transparency, bias. This can lead into incorrect results, creation of misleading algorithms and wrong data generation. The article suggests improving algorithms, thoroughly cleaning data, and including a wide spectrum of people in AI research to make journalism more impartial and trustworthy [5, 7, 13, 18].

3.4 Audience Analysis and Engagement

AI in media has benefits like personalized suggestions and automation (chatbots, news-writing AI). Its application is constrained by significant ethical concerns. The primary sources of the issues are biased algorithm design and training data. It can amplify societal presumptions and reinforce stereotypes. Because of this it will result in unfair.

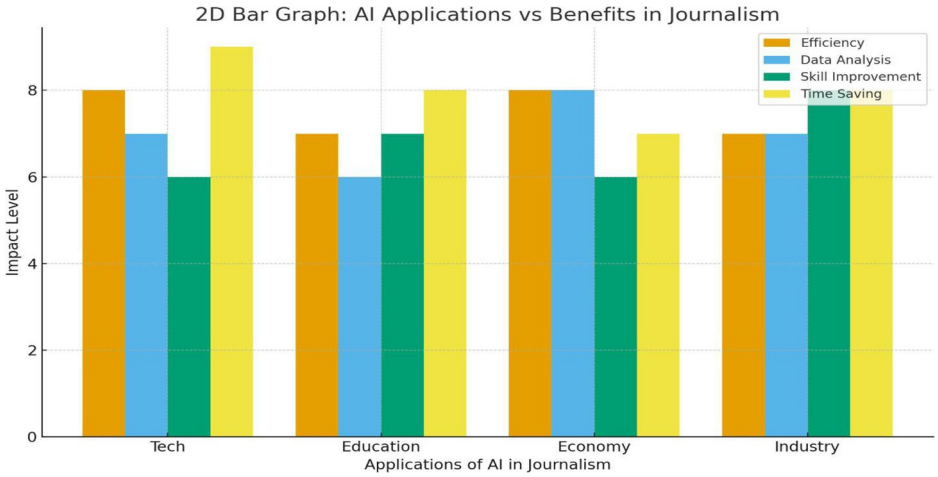

Fig. 3 Observations/issues across Data-Driven Investigative Journalism across different sectors

treatment. This lack of transparency is sometimes referred to as the" Black Box Problem,". It is difficult to identify the decisions made by AI and it will raise the risk of inaccurate reporting and information. Concerned about losing their employment and the" human touch," reporters are heavily in favor of timeliness and values. Some of the remedies that experts suggest to address the issue include better algorithms, better data preparation. It involves different people in development. So maintaining human oversight and responsibility through clear, legally binding frameworks is a necessity [1–4, 15].

3.5 Ethical and Editorial Decision Support

Bias, transparency, accountability, and job displacement are ethical concerns with AI in journalism. Biases from training data may be carried by AI systems. It may result in inaccurate or biased reporting. Trust issues and inaccuracy of data is caused due to less awareness regarding selection of news with the help of AI. The things become complex when mistakes or misinformation are generated by automated tools or techniques. So, at the end it's difficult to identify whom should be held accountable for mistakes. Whether it can be a journalist, developer or the system. It can break trust of audience. So basically, audience are more interested in news written by human. Enhancing automation in various steps can act as a threat for editorial employment, can decrease human overview [9, 11, 12, 15, 16, 19–22].

4 Applications of AI in Journalism

AI has transformed modern journalism by improving efficiency throughout different stages of news production. In content creation AI-driven tools can generate contents.

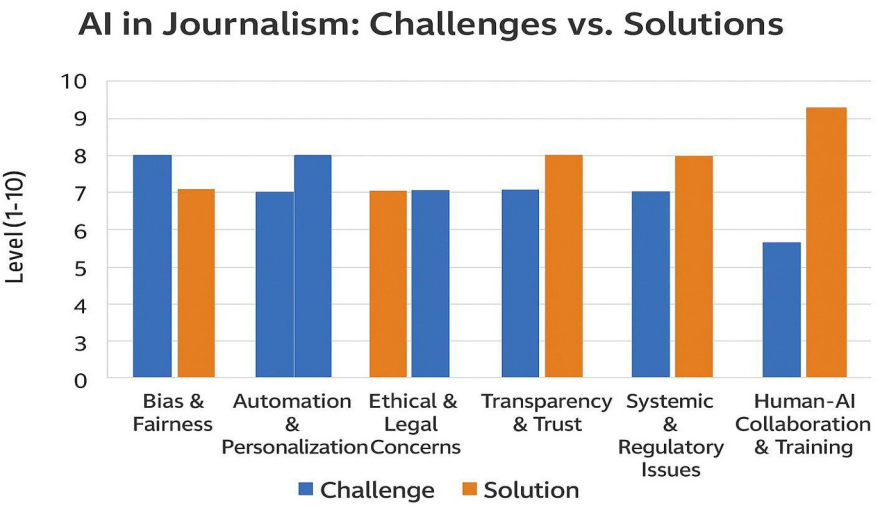

Fig. 4 Observations/issues across Audience Analysis and Engagement

such as reports of various sectors. For these tools like GPT, wordsmith etc. can be taken into consideration. As content generation is done by automation, journalists can mainly focus on creation of investigative and analytical stories. Personalized content delivery is another aspect where readers get news content as per their interest. It is implemented with the help of AI techniques and algorithms. It may contain topic modeling and collaborative filtering. AI plays a major role in establishing accuracy and accessibility. Automated fact-checking tools can automate tasks like information verification, misinformation detection, while computer vision aids in identifying deepfakes. Multilingual audiences can be benefitted by Machine translation and text-to-speech technologies.AI-powered visualization tools convert complex datasets into interactive graphics. It helps editors and readers in interpretation of trends with more clear aspect.

5 Ethical and Social Considerations

In journalism, AI's efficiency and creativity is beneficial. Simultaneously some major ethical concerns are raised which often require consideration. AI works on societal considerations or data biases, which in turn results in biased and manipulation reports. Responsibility or credibility is another issue in case of misinformation or mistakes which caused by AI. Transparency or openness is the right of a reader. They should have a clear idea of complete news content. Contents can be further influenced by AI technologies. Increasing automation raises concerns about job loss for editing

professionals. So, the ethical and transparent use of AI should be ensured in newsrooms. It requires the development of robust ethical frameworks and policies.

6 Conclusion

AI-driven systems undermine public trust due to inaccurate models, biased results, reduced performance and most importantly poor data quality. Data quality is hampered because of trusting open or user-generated sources, inadequate data cleaning, annotation issues and subjectivity. Limitations are present in writing opinion-based or investigative stories, complex language understanding, following privacy and ethical concerns while using AI. In summary AI-driven systems can help in the news domain for speed, accuracy, less expenses, but Human-AI collaboration is essential for accuracy, transparency, accountability, unbiases, etc. By combination of both, a very useful and innovative system can be built, which can enhance overall newsroom performance.

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