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Representations of Artificial Intelligence in Pakistani Newspapers

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Abstract

The current study aimed to explore the representation of Artificial Intelligence (AI) in Pakistani newspapers. It also highlighted the perspectives and concerns about AI. To understand the importance of AI, researchers determined its prevalence in news coverage (op-ed articles), categorical and temporal sentiment analysis, and AI framing. Furthermore, risks and rewards regarding AI, AI coverage concerning business, politics, law and order, education, military and intelligence, healthcare as well as others were also checked. The methodology of the study was based on quantitative and qualitative content analysis. The sample of the study comprised columns of the three leading English dallies from January 2023 to January 2024. These included Dawn, Pakistan Today, and The Nation among the top Ten English dallies. Data was collected using a purposive sampling technique. The findings showed that Pakistani newspapers depicted optimistic to cautious sentiments towards the use of AI in our daily lives. The most prevalent frames were risk and rewards of AI, the role of AI in education, followed by the role of AI in the legal system.

***Keywords*:** artificial intelligence, current situation, future expectation, Pakistani media trends

Introduction

The use of Artificial Intelligence (AI) has grown in our lives drastically. The transformative potential of AI has raised several questions regarding its use and ethical implications in our lives (Dwivedi et al., 2023). However, it is a widespread perception that AI is going to have a significant impact on our society and could be responsible for development in the future (Kelley et al., 2021). The rise of AI could be the best or the worst thing for society and all mankind, but we are not enlightened yet about whether the best is coming or the worst (Sun et al., 2020). People have ambiguous perceptions regarding the usage of AI. On the one hand, they are excited about the dramatic change in their lives due to the integration of AI, while some of

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them are concerned about the dangers of its uncontrolled use (Said et al., 2023).

It seems that AI possesses tremendous power to transform the society. Moreover, it has made people from all walks of life a part of their lives including scientists, media professionals, and the general public (Gruetzemacher & Whittlestone, 2022). The news media plays an important role in influencing people's perceptions about day-to-day events taking place in the world, shedding light on which event is important and how to think about it (Bryant et al., 2002). This is why, it is imperative to learn how media tends to mold public opinion about AI. Despite the popularity of AI in every walk of life, there is very little data available as to what type of public opinion Pakistani media has about AI. Therefore, this study attempted to determine what kind of opinion Pakistani newspapers have regarding AI. For this purpose, researchers analyzed the columns from the opinion pages of three leading English newspapers- Dawn, The Nation, and Pakistan Today from 1st January 2023 to 31st January 2024 in Pakistan, Lahore. Based on an extensive literature review about AI, framing analysis, and qualitative and quantitative content analysis, this research analyzed the columns of major English newspapers in Pakistan. It was evaluated how Pakistani newspapers are debating on AI, what future consequences they are anticipating , and how AI represents and frames it to the public.

Objectives

The current study aimed to address the following objectives:

- To understand the portrayal of AI in Pakistani newspapers
- To understand the popular sentiments presented in the Pakistani newspapers about AI
- To find out leading frames presented in the Pakistani newspapers

Research Questions

Based on the extensive literature, following research questions were proposed:

- How do the quantity and frequency of the columns about AI vary temporally?
- What topics were more prevalent in Pakistani newspapers about AI?

- What were the most popular sentiments in Pakistani newspapers about AI?
- How AI is framed in leading newspapers in Pakistan?

Literature Review

Public Understanding of Artificial Intelligence

Media coverage of innovations drives public discourse (Weiss & Nemeczek, 2022). AI is everywhere in our lives now and it is the media that informs us about the ethical considerations and greater ramifications of using such technologies (Christodoulou & Iordanou, 2021). In the Pakistani context, the media is already providing people with fair and realistic coverage of AI, however, it is still shallow. Therefore, the media needs to work on the multifaceted approach and provide the public with correct information including fact sheets along with trusted web pages, especially from reliable sources, such as government agencies (Ouchchy et al., 2020). Moreover, the media needs to keep the public updated about AI-related research and government regulations which could provide awareness of the pros and cons of using new technologies (Ouchchy et al., 2020). In this growing age of AI, traditional media can play an important role to make people learn about novel technologies and shape people's point of view towards these technologies (Nielsen, 2012). Like traditional or legacy media, entertainment media could also be a valuable tool to teach people about innovations. Nader et al. (2022) also conducted a study in Australia, however, their target was entertainment media. They found that although, entertainment media provides information about AI, their portrayal is rather extreme both positively and negatively and the public cannot hold such extreme beliefs. Nader et al. (2022) further added that entertainment can still provide information to the public if they start portraying AI more realistically in fiction.

Media Framing of Artificial Intelligence

Media started covering AI long ago, however, it has been spanning for more than four decades. Despite being covered in media, AI coverage has been intensive in the last five years. Sun et al. (2020) discussed in their study that the media defines AI as the viable solution to our daily life problems. These include health and the economy, which shows that AI is an emerging technology and may have a great impact on our daily lives in future.

Moreover, Chuan et al. (2019) found in their study that the American newspapers highlighted that AI works efficiently in business and technology and is quite beneficial. However, some societal issues need to be addressed regarding the AI. Emphasizing that AI may bring drastic changes in our lives, Sarısakaloğlu et al. (2021) conducted a study with a sample of two most circulated newspapers in Turkey in the year 2019. The study concluded that Turkish media framed AI as a supporter and assistance which is beneficial for the economic growth. Moreover, AI can eliminate human error and replace human labor, however, there are things that need to be considered regarding ethical concerns. Collectively, the study determined that AI has a positive tendency to change its users' lives.

Similarly, Cools et al. (2024) found in their study that automation and AI prominently work in artwork and education. They added that the integration of AI in education and artwork is more optimistic than pessimistic, however, the impacts of AI and ethical concerns are still enigmatic. To shed light on the sociotechnological future vision of AI, Köstler and Ossewaarde (2020) studied the framing of AI regarding the German Government policy documents in German newspapers. It was found that Germans are ready to embrace AI and being the largest economy in Europe, they are also planning to be the leader of AI in Europe. Framing of AI in the German newspapers shows that Germans are ready to learn as inspired from their past. They failed to benefit themselves from digital revolutions but they are not going to miss the AI revolution. Like other scholars, Wang et al. (2023) also conducted a research across different countries and at different times to contribute to the field of AI. It was determined that both utopian and dystopian narratives are there for AI. All the debates about hopes, fears, and priorities regarding AI are the reflection of national priorities.

Public Sentiments towards Artificial Intelligence

Concerns about AI pertaining to sociopolitical, socioeconomic, or education have many optimistic sentiments. However, Njuguna (2021) conducted a study on Samantha Sex robot and found that people felt that the sex robot invention is a complete moral absurdity. dehumanizing women, and destroyer of God made family bonding. He added that few people commented that sex robot is an effort of self-fulfilling prophecy and can incite the wrath of God which is nothing more than an apocalypse.

Theoretical Framework

The theoretical framework of the current study lies in the framing analysis of Goffman (1974). He defined that frames refer to an individual's efforts to influence one another through linguistic messages that normally define situations, their attributes, and also interpret structures and rules. Similarly, Gamson and Modigliani (1989) defined frames as "interpretive packages" that give meanings to the issues or it can be said that frames are the core idea of an issue. So, in the light of study conducted by Goffman (1974) and Gamson and Modigliani (1989), this study explored the linguistic messages and "interpretive packages" of columns written on AI in the leading English newspapers of Pakistan. The purpose was to get the idea that whether these interpretive packages are optimistic towards AI or not and what kind of sentiments they are shaping among public. For quantitative content analysis, the deductive approach of Entman (1993) was applied to select frames which says that frames in news can be identified through certain keywords, images, clusters of facts, phrases, or sources of information. However, qualitative content analysis is based on an inductive approach which says that tentative or operational definitions of the frames can be drawn for a specific study (Gamson, 1992).

Methodology

Researchers conducted the quantitative and qualitative content analysis of the articles/ columns from opinion pages of three leading English newspapers of Pakistan from 1st January 2023 to 31st January 2024. This time period was selected to acquire the most recent information about traditional media cultivating sentiments among public. In Pakistan, AI became popular in this time period. The population of the study comprised articles/columns from opinion pages of three leading English newspapers of Pakistan from 1st January 2023 to 31st January 2024. Researchers selected the sample through purposive sampling technique and picked every article written on AI. A total of 37 articles written on AI were obtained after screening. The unit of analysis of the study was the individual column.

Operationalization

Each column was coded according to the keyframes defined in the articles. Coding was not mutually exclusive because more than one frame was discussed in the articles. Researchers coded the articles in eight frames: risks and rewards regarding AI, AI and climate, AI and politics, AI and

business, AI and law and order, AI in education, AI in military and intelligence, and AI in healthcare.

To code articles in positive, negative, and neutral sentiments researchers took clusters from the articles and placed them into positive, negative, and neutral categories. Researchers coded clusters created on the pre-decided keywords based on major frames. For temporal and categorical sentiment analysis of the columns, each frame was coded into positive, negative, and neutral categories. Keywords for sentiment analysis are as follows:

Positive Sentiments

Minimizing the knowledge gap, promoting quality education, not banning AI, helping lawyers solve cases, helping in healthcare, helping in promoting democracy, transparency, accountability, civic engagement, helping in business and economic growth, controlling cyberbullying, hate speech and misinformation, deal gender-base gaps, creating new jobs, and helping in military and intelligence.

Negative Sentiments

Brain drain, maximized knowledge gap, loss of quality education, loss of jobs, dehumanization, increase in cyber attacks, biological warfare, cyber warfare, autonomous warfare, decentralization in politics, anti democritization of societies, promoting hate speech and misinformation.

Neutral

If keywords of negative and positive sentiments are equal or promote unbiased and accurate use of AI, then the article is neutral.

Results and Discussion

RQ 1. How do the quantity and frequency of the columns about AI vary temporally?

A total of 37 columns in three English leading newspapers of Pakistan written on AI were screened. The frequency of the column in Dawn and Pakistan Today was 13 (35.1%). However, less coverage of AI was observed in The Nation, that is, 11 (29.7%) compared to Dawn and Pakistan Today as shown in Table 1.

Table 1

Frequencies of Columns Based on Newspapers

	Frequency	Percentage	Valid Percentage
Dawn	13	35.1%	35.1%
Pakistan Today	13	35.1%	35.1%
The Nation	11	29.7%	29.7%
Total	37	100	100

Overall, not enough columns were written on AI from January 2023 to January 2024 as shown in Table 2. To get more insight into the quantity and frequency of the columns written on AI among different newspapers temporally, researchers applied the chi-square test on both categorical variables. The results of the test showed that the *p*-value 0.630 was much greater than the significant level 0.05. This means that the quantity and frequency of the columns do not vary over time as shown in Tables 2 and 3.

Table 2

Temporal Comparison of the Columns and Newspapers

Newspaper	Month												Total
	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	July 23	Aug 23	Sep 23	Oct 23	Dec 23	Jan 24	
Dawn	1	1	0	3	1	1	1	1	1	1	1	1	13
Pakistan today	1	0	2	2	0	0	0	1	5	0	2	0	13
The Nation	1	2	1	1	2	0	1	1	1	0	0	1	11
Total	3	3	3	6	3	1	2	3	7	1	3	2	37

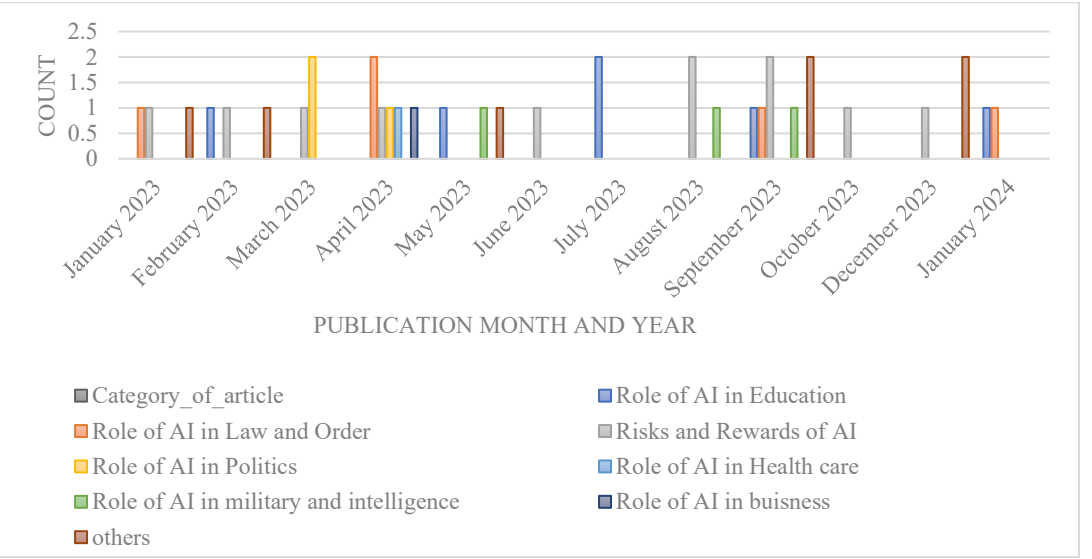
Table 3

Temporall Analysis of the Difference in Quantity and Frequency of Columns

Sample Size = 37	Pearson chi-square Value	*p*-value
37	19.245	0.630

Figure 1

Quantity and Frequency of Prevalent Frames



RQ 2. What topics were more prevalent in Pakistani newspapers about AI?

Results showed that there were 16.2% articles about the role of AI in education, 13.5% were about the role of AI in maintaining law and order, 29.7% were about the risks and rewards of using AI in our daily lives, and 8.1% were about the role of AI in politics. Furthermore, 2.7% columns explained how Ai can facilitate people in healthcare, 10.8% columns were about the role AI could play in military and intelligence, 2.7% emphasized the importance of AI in business world, and 16.2% columns were about other random topics. However, they were about AI as shown in Table 2. Qualitative analysis of these frames is as follows:

Table 4

Prevalent Frames about AI

Frames of Articles	Education	Law and Order	Risks and Rewards	Politics	Healthcare	Military and Intelligence	Business	others	Total
f	6	5	11	3	1	4	1	6	37
%	16.2	13.5	29.7	8.1	2.7	10.8	2.7	16.2	100.0

RQ 3. What were the most popular sentiments in Pakistani newspapers about AI?

Overall sentiments of news articles towards generative AI across different newspapers were found neutral. Data was coded into positive, negative, and neutral sentiments. After coding articles according to the above mentioned positive, negative, and neutral categories, it was found that the most popular sentiments in Pakistani newspapers about AI were neutral (Fig. 2, Table 5). Through analysis, it was determined that generative AI is not detrimental to society but proper regulations are needed. Categories were not mutually exclusive, that is why neutral means Pakistani newspapers are setting the frames for the society from optimistic to cautious. Since data was nominal, researcher applied the chi-square test to verify whether there was a significant difference among the sentimental categories or not. Test results showed that there was no significant difference in the coverage of articles of different newspapers towards different sentiments as p=0.095 which is greater than 0.05 (Table 6). However, there was a significant difference among the sentiments of categories of the news articles, as p=.010 for df=144 which is <.05 (Fig. 3, Table 7,8). It means that newspapers' coverage was alike in the context of quantity but it differed with the way they treated the frames in their articles.

Table 5

Sentiment Analysis of Articles

		Dawn	Pakistan Today	The Nation	Total
Sentiments	Positive	6	5	1	12
	Negative	2	5	2	09
	Neutral	5	3	8	16
Total		13	13	11	37

Table 6

Chi-square for Sentiment Analysis of Articles

Sample size= N	Pearson chi-square	df	p-value
37	7.917	4	0.96

Figure 2

Sentiment Analysis of Articles across Newspapers

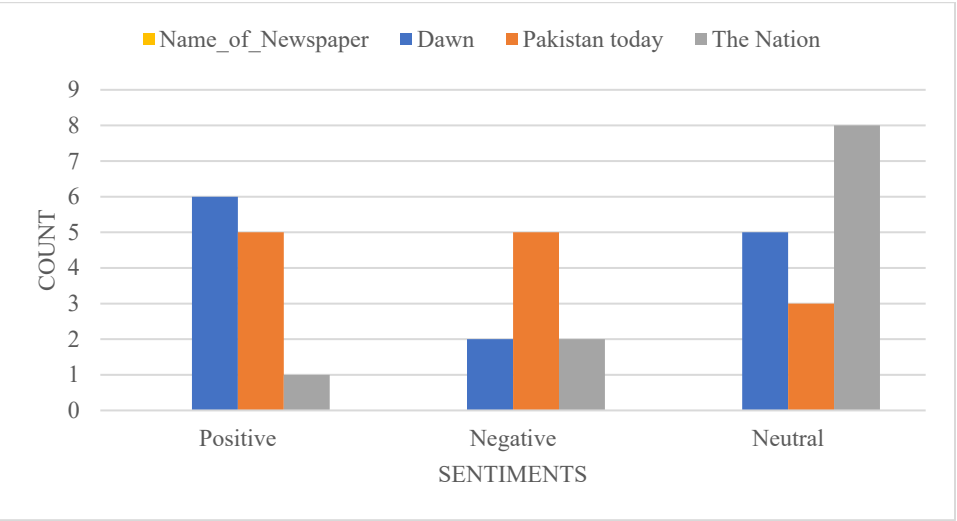


Table 7

Sentiment Analysis of Prevalent Frames

Prevalent Frames	Sentiments			Total
	Positive	Negative	Neutral	
Education	2	0	4	6
Law and Order	4	0	1	5
Risks and Rewards of AI	2	6	3	11
Politics	0	0	3	3
Healthcare	1	0	0	1
Military and Intelligence	0	0	4	4
Business	0	1	0	1
Other	3	2	1	6
Total	12	9	16	37

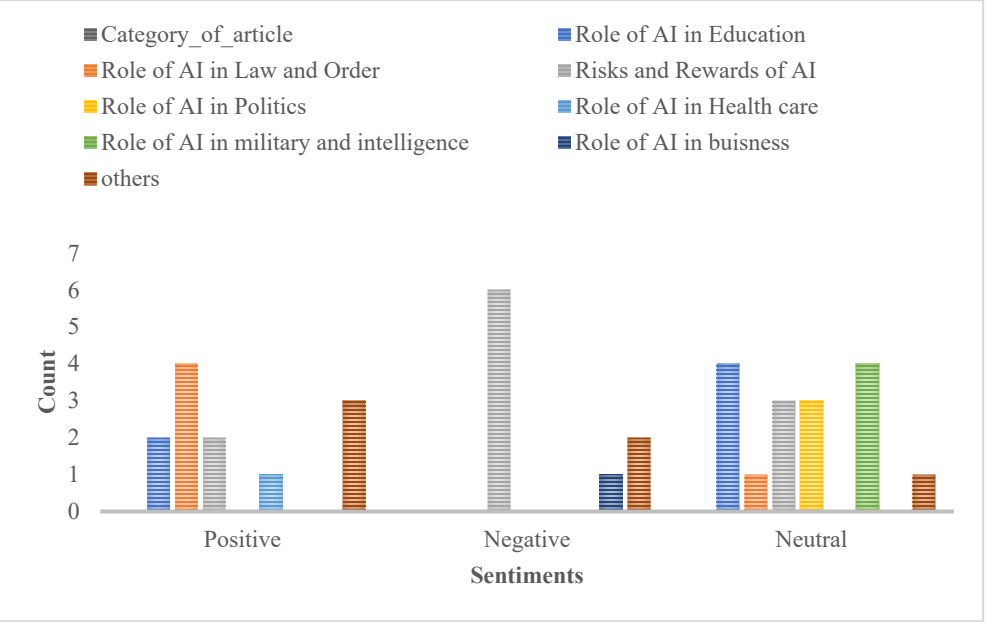
Table 8

Sentiment Analysis of Prevalent Frames

Sample size =*N*	Pearson chi-square	*df*	*p*-value
37	29.152	14	0.01

Figure 3

Sentiment Analysis of Prevalent Frames



RQ 4. How is AI framed in leading newspapers in Pakistan?

The findings added in this section were taken from a total of 37 screened opinion articles. The section is divided into 8 different themes and these themes are based on the most prevalent topics discussed in opinion articles. Risks and rewards regarding AI were one of the top prevalent topics in the articles followed by the role of AI in education, law and order, politics, military and intelligence, business, and healthcare. Furthermore, most of the articles were just informing about AI without supporting any kind of sentiments.

Role of AI in Education

The overall response of authors towards AI in the education system remained neutral (Table 5). It was found that AI has the potential to transform the educational system through inclusive learning, teacher empowerment, enhancing human skills, accelerating students' holistic development, and navigating uncertainty. Challenges posed by ChatGpt and job insecurity created among teachers are the major challenges. Findings suggested that there are potential benefits of AI in education. However,

some implementations are needed, such as mitigating biases ensuring privacy and data security of users, transparency, and developers need to ensure the ethical use of AI. Similar results were compiled by Zhai et al. (2021) in their study. They wrote in their study that AI proposed challenges to the education system due to its unethical and irresponsible use. However, AI can strengthen the educational foundations if educators and engineers promise to responsible collaborative research.

Role of AI in Law and Order

Considering the impact of AI on the legal system of the country, it was found that similar to education, authors are also optimistic about the integration of AI in law and order. Pakistani media is attempting to develop a positive behavior towards AI in the legal system (Table 5). With the help of AI, decision-making processes can be faster. Furthermore, predictive analytics of AI may help judges to make informed decisions. AI could work as a legal assistant to deal with a large amount of data, identify patterns in data, and play the role of mediator or arbitrator. AI as an arbitrator can reduce human error and may make processes more transparent and efficient. Rissland et al. (2003) stated that law and AI have a fruitful synergy. Furthermore, AI not only helps the judicial system by creating programs that produce legal judgments but also works on case-based reasoning (CBR) system which provides law community with the most streamed results for legal judgments.

However, ethical considerations, such as human values and bias are critical while using AI in the legal process. Although, the authors recommended that with cautious use and human oversight, these issues can be dealth with. Moreover, help can be taken from AI to speed up the legal process.

AI and Business

There are not enough articles about the role of AI in the business world. Only one out of 37 articles have been written on business and AI (Table 5). Although, quantity wasn't enough, it was found that half of the businessmen were using AI to manage fraud and cybersecurity (51%), for website trafficking issues, to write content for their websites, to craft international communication, to improve customer relationships (56%), inventory management, and optimizing emails. However, very few businessmen showed concerns about overdependence on technology. Chui et al. (2018)

also said that if entrepreneurs and business would believe, AI may be in every product we buy and use and its application to solve business problems is growing rapidly.

AI in Military and Intelligence

Coverage regarding AI's role in military and intelligence was found to be less than education and legal systems but greater than business (Table 5). Overall, coverage was found optimistic to cautious. For the first time in history, America has launched the world's first 3D-printed rocket using AI which raised many questions. 3D printing driven by AI can enhance indigenous manufacturing capabilities and whether the material used in nuclear weapons can be manufactured additively using AI (Mir, 2023). Apart from this, AI may help military and intelligence with automation routine tasks, surveillance through AI-driven drones, and defending against cyber-attacks. However, the use of AI in warfare has raised many concerns. Along with ethical dilemmas, the power of AI is interwoven with geopolitical rivalries. In November 2020, an Iranian nuclear scientist was killed using an AI-augmented rifle mentioned by Eqbal (2023). That is why when AI provides immense potential, its deployment in military and intelligence cannot be denied. However, it must be done considering ethical dilemmas, transparency, and international cooperation.

AI and Politics

The role of AI in politics and maintaining democracy is crucial. Wherever opportunities are found, ethical concerns are also there. Therefore, deploying AI to maintain democracy raises ethical and transparency concerns but collectively coverage goes from optimistic to cautious (Table 5). The critical analysis of articles highlighted that the use of AI in politics may help deal with a large amount of data for informed decisions, predict or prevent elections from any kind of interference, and enhance civic engagement. Although transparency and accountability can be questioned, fake news may spread propaganda, hate speech, and deepfake. Moreover, AI generated fake pictures and videos could spoil politicians' repute, the poll can be manipulated, such as Cambridge data mining scandal, and potential impact on public opinion could make people not to share their opinions. Opportunities and challenges are equal but responsible deployment can help maintain democracy. Kane (2019) endorsed the results in his study and stated that AI-based tools may help

politicians during election campaigns. American President Donald Trump's 2016 presidential campaign, the Brexit referendum, and the UK leave campaigns were notably the successful campaigns in which technology was used. Critics also mentioned that they used unethical means in these campaigns so, the ethical use of AI is too complex.

AI and Healthcare

Only one article was written throughout the year on the role of AI in healthcare and sentiments were positive. Analysis showed that AI is helpful in providing information that leads towards better disease management, increases drug safety, and speeds up disease diagnosis and screening. Reddy et al. (2020) also mentioned that the efficacy of AI is to improvet healthcare and it is evident that it would be a part of routine clinical care in the future. Healthcare is profound and AI is nothing more than an opportunity to take benefits from it. Challenges are there, as people have not started trusting AI-driven treatments yet. Every 1 in 4 patients avoid such treatments but a balanced approach can facilitate human beings with maximum benefits.

Risks and Rewards of AI

Rewards of AI

The best reward given by AI to the academicians including teachers, students, and writers is the efficiency and productivity in writing. AI provides proofreading, grammar checks, and translations which help people deal with foreign languages. AI provides ideas to the writers. Moreover, it connects people globally. Economic opportunities have increased due to AI since it has the potential to increase productivity. Furthermore, its ability to predict financial crises has increased the profits of banks and other industries. Due to AI, people have easy access to information due to which they can make informed decisions. This makes them informed citizens which is the strong foundation of democracy. Artificial horizon has become an important tool in aviation and navigation.

Risks of AI

The biggest concern of AI is that it does not have emotions like human beings which makes it difficult for AI to show empathy while creating content. Information provided by AI is based on the data we deliver. Sometimes inaccuracy in the data or limited data may spread misinformation which could result in major consequences. By introducing

new skills in the market, such as Machine Learning (ML), AI has created many new job categories. Moreover, it has already replaced many previous jobs and rendered many people jobless. AI provides information which is already available on the Internet due to which the originality of the text could be questionable.

Where access to information makes people more informed, it also creates privacy issues simultaneously, increasing cybersecurity threats. Furthermore, other risks due to AI include dehumanization, catastrophic risks, surpassing the human mind, religious unrest due to misinformation, political distress due to deepfake, and autonomous warfare due to AI-driven weapons.

AI and Climate

Analysis shows that AI aid in climate change may help limit storms, wildfires, and droughts. This contributes to building designs that are energy efficient, cutting the greenhouse effect, energy optimization, power generation, and disaster predictions to limit them. Kaack et al. (2022) introduced a framework to understand the effects of ML on GHQ emission. Using this framework, a better policy may be suggested to understand the effects of ML on climate mitigation. AI Addresses both contributions and challenges in climate change but responsible and strategic implementation may have outcomes.

Conclusion

Researchers found that generative AI is not detrimental to society, however, people may take advantage of it with proper policy regulation. As it has already been mentioned that categories are not mutually exclusive, and in this study "neutral" means Pakistani newspapers are setting the frames for the society from optimistic to cautious. Risk and rewards regarding AI were one of the top prevalent topics in the articles followed by the role of AI in education, law and order, politics, military and intelligence, business, and healthcare. Most of the articles were just informing about AI without taking sides towards any kind of sentiments. There was a significant difference among the sentiments of the prevalent frames of the news articles, as p=.010 for df=144 which was <.05. However, there was no significant difference among the sentiments of prevalent frames of articles.

Limitations

The current study observed the following limitations:

- This was a pilot study therefore, the results cannot be generalized for legacy media overall.
- Categories for sentiment analysis and prevalent frames were not mutually exclusive.
- Study was based on only newspapers. For better outcomes, other broadcast media and social media must be added.

Author Contribution

Sadia Abbas: conceptualization, methodology, formal analysis, investigation, resources, data curation, writing – original draft, writing – review & editing, visualization, project administration. **Ayesha Ashfaq:** methodology, investigation, writing – review & editing, supervision.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

Data supporting the findings of this study will be made available by the corresponding author upon request.

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