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Article:	**Artificial Intelligence (AI) In Pakistani Newsrooms: Examining the Adoption and Impact of Artificial Intelligence in Dawn, Jang, and Express Newspapers**
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ABSTRACT

Artificial intelligence (AI) stimulates creativity and increases the productivity of human beings. AI is playing an important role in different sectors of the media industry by producing, evaluating data sets, and generating content. Journalists can use AI to evaluate the worthiness of news and the impact of news that can help in accurate reporting. It examined the impact of and adoption of artificial intelligence in Pakistani newsrooms. The study used purposive sampling techniques to select 150 participants' journalists from the three prominent daily Newspapers of Pakistan: Dawn, Jang, and Express. The study's significant findings underscore the profound impact of AI technology on the media industry in Pakistan. The study recommends addressing the challenges related to AI adoption by ensuring government and organizational support. Finally, media practitioners and regulators should enhance awareness of AI benefits among all stakeholders in the media and communication sectors.

Keywords: Media, Communication, Artificial intelligence, Journalist, Newsroom.

Introduction

In modern times, John McCarthy, the father of artificial intelligence, will likely use the term "computational intelligence" instead of "artificial intelligence." As the father of artificial intelligence, McCarthy created the Lisp language, used for list processing. McCarthy's research on elaboration tolerance, machine creativity, machine free will, and some enhanced situation calculus techniques, the author takes a look at McCarthy's conception of Lisp. It marked the emergence of a groundbreaking technology at the time. Artificial intelligence has since been integrated across different sectors like finance, engineering, pharmacy, medicine, and, more recently, the media industry, to enhance journalistic functions and activities. Artificial intelligence significantly improves the profitability of businesses worldwide. It can sometimes perform tasks more methodically or efficiently than human intelligence.

Merrill Lynch, M.D. Bank of America, stated that artificial intelligence is the key technology poised to drive industrial growth. Crepto (2018) suggested, noting that since 1980, the automation of news production has paved the way for data-driven journalism. Artificial intelligence uses machines to analyze data, identify patterns, and disseminate findings in various media formats. Furthermore, data journalism, a modern and popular practice, assists journalists by utilizing AI technology to provide in-depth insights into news via data analysis processed through it, allowing for easier analysis. Today many countries, including Pakistan have embraced artificial intelligence technology in journalism. Although still emerging in many industries, AI's adoption in journalism has yielded positive outcomes and can be applied across different journalism genres.

AI is increasingly being utilized in journalism to induce significant changes within the industry (Galily, 2018). Omebring (2016) argues that artificial intelligence has become fundamental in transforming the landscape of journalism, including the skill sets of journalists. The way of content generation is changed in newsrooms due to using the technology of artificial intelligence. Prediction of user behavior solely depends on demographics, and pat interactions which are analyzed by artificial intelligence. Nowadays, AI is being used in Pakistani newsrooms to tailor news to their users based on their personalized feeds and interests. This technique is also being used by tech giants like Facebook, and Twitter based on AI algorithms of social media users.

Main Types of Artificial Intelligence

There are four types of AI which are the following.

1. Reactive AI: This is the basic type of AI that has no memory and is more task-oriented. It can only respond to certain stimuli; it cannot recall previous interactions.

2. Limited Memory AI: The type of AI that can predict future events but is unable to learn from past simulations due to limited memory and it has short storage of data. This type of technology has been beneficial in self-driving cars because it makes decisions in real time.

3. Theory of Mind AI: This type of AI is more advanced, establishing a bridge between current AI capacities to future possibilities. It is used to understand human thought, emotion and intelligence. Theory of mind devices may eventually be able to predict behavior and comprehend intentions, much like human beings.

4. Awareness AIs: This type of AI represents the highest level of artificial intelligence because of its capability to infuse the elements of consciousness and environmental understanding that

is being depicted in robots. The basic purpose of AI is to increase the resources and facilitating them to be conscious, self-aware, and capable of understanding the emotions of others.

AI (Artificial intelligence) in Newsrooms

In the 21st century, artificial intelligence (AI) is being used in different sectors and producing a significant impact on different professions worldwide. AI is also being used in journalism and media industry which has changed the whole picture of journalism. Artificial Intelligence is playing a key role in the newsrooms of developed countries. In different sectors of journalism, artificial intelligence is used to improve the reporting, content creation, authenticity, fact-checking, and distribution of newspapers to the readers. This technology is being used to gain accurate results in a short period at the organizational level. The editorial board is using this technology to create journalistic content for their editorial page. More than 75% of journalists use AI to produce media content accurately and high-quality content. The news that has been generated by AI technology and fact-checking by AI is more trustworthy for the general public and media. Using AI technology in the newsroom is more beneficial for both journalists and audience or readers because it enhances the quality and quantity of news.

Rapid Verification: It is an important tool of technology in the newsroom because it can verify any news rapidly as compared to human investigative journalism.

Trend Analysis: AI has a unique quality to analyze the data based on location, time, and date in a short period which helps in the detection of trends.

Comprehensive Analysis of News Story: AI technology has far-reaching effects on complex stories of the past because it can detect historical biases in data, unfolding complex truths that help journalists in making more efficient and accurate stories.

Literature Review

This chapter of the review examined the different aspects of the relationship between journalism and artificial intelligence. In the twenty-first century is big revolution took place in the advancement of technology due to artificial intelligence (AI). Many industries, including the media, are being reshaped due to the advancement of technology. In the media industry, AI can be used to collect the news and increase journalistic skills (Omebring, 2016; Galily, 2018). In the 21st century, artificial intelligence (AI), cannot be ignored because it is playing a key role in different professional of the world (Vaglis & Brtsas, 2017). Journalists can create a good quality of content by using AI in their newsroom and they can do valuable investigative reporting and research. Nowadays well-tech newsrooms use automation technology to update their subscriber. AI technology like Heliograph is used to examine the quality of journalism and it is the best example of AI used in newsrooms (Waheed & Mohammed, 2019).

Mark et al. (2017) concluded that AI is having an impact on reporting, editing, content creation, and distribution of news. AI technology is also used to check the facts. It is urgent for journalists to fully understand how to use artificial intelligence to tell stories pleasantly and efficiently. Journalists must use artificial intelligence technology to instill good ethical values.

Alajemba and James (2018) argue that newsrooms must invest more in the implementation of AI technology due to its global nature in media and communication. AI integration must be developed, in addition to financial resources. For this new technology to be used to its fullest potential and for editors and reporters to receive thorough training, this is also necessary (Kray, 2018). Journalists must receive not only technical but also critical thinking skills so they can evaluate the veracity and accuracy of content created by artificial

intelligence. Kray,(2018) suggested that it is the future technology software solution to global problems.

Research by Kent (2015, 2019) highlights that while AI can automate some routine tasks, like producing basic reports based on structured data, it does not completely replace the need for human journalists. While using AI for routine tasks, news organizations such as the Associated Press still rely on human journalists for investigative reporting, in-depth reporting, and analysis. Kent (2019) stated that Heliograf writes stories for the Washington Post and Swedish news publishers, while the media produces robots that write stories. According to Hintze (2016), artificial intelligence (AI) is surpassing traditional performance and creative levels to revolutionize the fields of journalism and other professions worldwide. Machine and deep learning are the main technologies fueling this revolution.

The AP is a prime example of the expanding field of "augmented journalism," in which artificial intelligence (AI) works in tandem with human journalists. This method automates processes like data analysis, trend identification, and even content creation by utilizing supervised and unsupervised processing, and word recognition systems. This allows reporters to devote more time to in-depth research and investigative reporting, which eventually results in more news being covered, more accurate news being delivered, and a greater variety of news stories being covered (Marconi, 2016).

According to Nsude (2019), AI has the potential to create new job opportunities in journalism, particularly high-paying positions that require specialized skills in interacting with AI tools. However, Marr (2017), pointed out different reasons and emphasizes the decline of local news industries as audiences migrate to online platforms. This shift has unfortunately resulted in job losses for local journalists, whose content struggles to compete with the immediacy and accessibility of online news sources. Artificial intelligence is greatly used in reporting through journalists' assistance in designing a digestible.

One of the primary strengths of AI in journalism is its ability to improve reporting accuracy and efficiency. This technology helps journalists create compelling narratives and structure data in an understandable format for audiences. He further suggested that there has been a change in newsroom roles through the use of automated editors (Marconi, 2016).

Latar,(2018) and Aljazairi,(2016) suggested that AI currently lacks the creativity and emotional intelligence of human journalists. AI struggles to analyze and respond to readers' emotional reactions, as well as track unexpected societal developments that require human intuition and social awareness. According to Latar (2018), artificial intelligence frequently fails to explain its decisions or the sources of its results.

According to Ombellet et al. (2016), maintaining reader trust requires a clear distinction between news that is generated by AI and news that is written by humans. Trust can be damaged and ethical questions are raised by opaque data collection and usage methods systems have the potential to reinforce human prejudices, producing unfair or discriminatory content (Osoba & Welser, 2017; Larson, 2017). AI depends on massive datasets, privacy issues are brought up by potentially invasive data collection methods (Wang & Siau, 2018).

Research Objectives

The primary objective of this study is to examine the impact of artificial intelligence on the media industry in Pakistan.

1. To explore how journalists in Pakistan perceive artificial intelligence as an enhancement in reporting practices.
2. To determine the role of artificial intelligence in the media industry in Pakistan.
3. To investigate the role of artificial intelligence in the field of journalism in Pakistan.

Hypotheses

There are the following hypotheses:

H 1: Pakistani Journalists perceive artificial intelligence as an enhancement tool for reporting.

H 2: Artificial intelligence plays a significant role in the media industry of Pakistan.

H 3: Artificial intelligence contributes to various sectors of journalism, in Pakistan.

Theoretical Framework

The technological determinism theory is an appropriate theoretical framework for this investigation. American sociologist Thorstein Veblen developed this theory between 1857 and 1929. Karl Max claimed that obvious changes in productive technology have an impact on organizational structure and social relations of human beings. Technology advancement, according to Karl Max and Asemah et al. (2017), assures novel methods of production in society, which impacts its cultural, political, and economic aspects and, ultimately, transforms it. This theory is significant because it addresses how the advancement and growth of robotic technology will affect various societal sectors. Technological innovation is a novel approach to production that has an indirect impact on societal political, cultural, and economic aspects. Technological determinism theory was expanded by Marshall Mcluhan in 1964, who concentrated on the implications of information and communication technology for individuals, groups, and society. This theory also highlights how media technology affects people's thoughts and behaviors in a technologically driven society. Writing, printing, television, and computer technology, on the other hand, are changing society through the production of high-quality content and analysis of emerging technological trends. The application of this theory to Pakistani media is appropriate In short, this theory becomes an invaluable tool for unraveling the various layers IA uses in the media of Pakistan. By applying this theory, the study can delve into the specific area employed by the Pakistani media.

Methodology

Research methodology provides a scientific and systematic method to solve a research problem. This method is particularly effective in evaluating the impact of artificial intelligence on different sectors of journalism within Pakistan's media landscape.

Population

The population for this study are employees of three of Pakistan's leading newspapers, Daily Dawn, Daily Jang, and Daly Express. These newspapers were selected because they have a significant influence and wide reach of subscribers. These three Pakistani newspapers were selected because these newspapers having a huge circulation and are being read by most people.

Sampling Technique

There were a total of 150 employees who were selected by using a convenience sampling technique and this method was selected due to its practicality. All data was collected by using a questionnaire. There were 50 questionnaires equally distributed among the Dawn, Jang, and Express newspaper journalists. Overall, 123 out of the 150 questionnaires were properly filled in and returned, representing an overall return rate of approximately 82%. out of the 150 questionnaires, 123 were correctly completed and returned, resulting in an

approximate 82% return rate. The returned questionnaires were analyzed by using statistical tools to determine frequencies, percentages, and correlations between variables.

The following table presents the analysis of the questionnaires collected from Dawn newspaper in Pakistan:

Table 1: Data Collected from Dawn Newspaper

PARTICIPANTS	FREQUENCY	PERCENT (%)
RETURNED	45	90
NOT RETURNED	5	10
Total	**50**	**100**

The response rates to a survey conducted inside a Dawn newspaper to determine the level of artificial intelligence (AI) technology adoption in journalism are summarized in the table. In particular, the table reveals that 45 of the 50 participants that were sent successfully returned, yielding a 90% response rate. However, the 10% non-response rate, while small, may represent a segment of the workforce whose perspectives and insights are missing from the survey findings.

Table 2: Data Collected from Jang Newspaper

PARTICIPANTS	FREQUENCY	PERCENT (%)
RETURNED	40	80
NOT RETURNED	10	20
Total	**50**	**100**

This table shows the distribution and response rates of the questionnaires distributed to employees of Jang newspaper, a prominent media house in Pakistan. According to the table, 40 percent of the total participants distributed were returned. This equates to an 80% return rate, which is quite significant and generally indicates a high level of engagement among the participants. A return rate this high indicates that the majority of respondents were motivated by the subject matter.

Table 3: Data Collected from Express Newspaper

PARTICIPANTS	FREQUENCY	PERCENTAGE (%)
RETURNED	38	76
NOT RETURNED	12	24
Total	**50**	**100**

The table shows the response rates for a survey distributed to 50 participants of Express journalists. A total of 38 participants returned the questionnaire, for a 76% response rate. This is a relatively high response rate, indicating that the vast majority of participants were interested enough to complete and return the survey. On the other hand, 12 questionnaires were not returned, as indicated by the table; this represents a 24% non-response rate.

Table 4: Total Collected Questionnaires

PARTICIPANTS	FREQUENCY	PERCENTAGE (%)
RETURNED	123	82
NOT RETURNED	27	18
Total	**150**	**100**

The table shows the respondents rate of a survey distributed which is distributed among 150 participants from three main newspapers in Pakistan. According to the data, 123 questionnaires were returned, representing an 82% response rate. This is a relatively high return rate, indicating strong participant engagement. Such a high level of participation suggests that the survey was relevant and interesting to the majority of respondents, lending significant credibility to the data gathered. The table shows that 27 questionnaires, or 18% of the total, were not returned.

Results and Discussion

The study's main focus was to determine the impact of AI in newsrooms. The analysis focused on the impacts and adoption of artificial intelligence in newsrooms. The findings of the study revealed a significant relationship. Test results from data collected in Pakistan's newspapers show variation in respondents' perceptions of the impact of artificial intelligence (AI) on the media industries. These findings highlight that, while AI's impact is widely acknowledged, its implementation and perceived benefits differ across organizations and individuals in the sector.

H 1: **Pakistani Journalists perceive artificial intelligence as an enhancement tool for reporting.**

Table 5:

HYPOTHESIS-1	Newspaper	Statistics	F	Sig. Value (F)	T	Sig. Value (T)	Decision
Pakistani Journalists perceive artificial intelligence as an enhancement tool for reporting	Dawn - 45	1.87	0.518	0.314	1.29	0.015	**Approved**
	Jang - 40	2.13					
	Express - 38	2.90					

This research examined the perceptions of Pakistani journalists about artificial intelligence (AI) as a source to improve their reporting techniques. According to the findings, reporters for Pakistan's newspapers, daily Dawn, Jang, and Express, approved that artificial intelligence (AI) has a bearing on improving reporting. The statistical significance (1.87% for Dawn, 2.13 for Jang, and 2.90 for Express) and its significance values (all above 0.05) show that there is no significant difference in the opinions of journalists about the utilization of AI in all these newspapers. According to this hypothesis, Pakistani journalists consider artificial intelligence to be a useful tool for their reporting, and based on results the hypothesis is accepted.

H 2: Artificial intelligence plays a significant role in the media industry of Pakistan.

Table 6:

HYPOTHESIS-2	Newspaper	Statistics	F	Sig. Value (F)	T	Sig. Value (T)	Decision
Artificial intelligence plays a significant role in the media industry of Pakistan	Dawn - 45	1.96	2.241	0.215	0.144	0.031	**Approved**
	Jang - 40	3.52					
	Express - 38	2.04					

According to the findings, most of the journalists in these newspapers consider AI has a significant impact on the media industry. The two statistical tests used in the investigation form the basis of this conclusion. The perceptions of AI's role among journalists from each newspaper differed significantly. There may not be a statistically significant difference in these perceptions between the newspapers, according to the statistic (which ranges from 1.96 to 3.52) and its corresponding significance values (all above 0.05). The extremely low significance values (all below 0.05) of the T-statistics, 0.144, provide compelling evidence to accept the hypothesis.

H 3: Artificial intelligence contributes to journalism, in Pakistan

Table 6:

HYPOTHESIS-3	Newspaper	Statistics	F	Sig. Value (F)	T	Sig. Value (T)	Decision
A I technology contributes to journalism in Pakistan	Dawn – 45	3.55	0.98	0.442	1.982	0.001	**Approved**
	Jang – 40	2.09					
	Express – 38	2.91					

This study examined the perceptions of Pakistani journalists about artificial intelligence's (AI) value to the media. The results indicate that most of the journalists working in these newspapers are users of AI and it is important to their industry. Two statistical tests used in the analysis support this conclusion. The significance values (all above 0.05) and statistics (ranging from 2.09 to 3.55) suggest that there may not be a statistically significant difference in the opinions of journalists from each newspaper about the utilization of AI in newspapers. The hypothesis, that AI plays part in Pakistani journalism, is strongly approved by the T-statistics and their significance values. All three hypotheses were approved, and it was concluded that artificial intelligence has a significant impact on the media industries of Pakistan.

Conclusion

Overall, the findings indicate that AI is rapidly changing the Pakistani media environment. As journalists recognize its benefits, AI is expected to play an increasingly important role in news production and consumption. The study concluded that while the adoption of artificial intelligence benefits the media and industry in Pakistan, numerous challenges must be addressed to ensure the technology's successful deployment in the field of journalism. Journalists and media outlets should adopt and embrace this technology as a transformative change in the digital world of the twenty-first century to improve journalism activities and operations.

Recommendations

The following recommendations have been made based on the results.

(1)The government and media industry should address the obstacles that the media industry faces in adopting AI.

(2) The authenticity of news or articles can be verified through the use of metadata and tracking black techniques to control fake news.

(3) The government should provide financial support to artificial intelligence organization.

(4) The advantages of AI for all parties involved in media and communication must be made known by practitioners and media regulators.

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