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CHALLENGES AND PROSPECTS OF ARTIFICIAL INTELLIGENCE IN NIGERIAN JOURNALISM PRACTICE: A NARRATIVE REVIEW

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Abstract

The integration of artificial intelligence (AI) into Nigerian journalism practices presents both challenges and prospects for the industry. This paper explores the dynamic interplay between AI technologies and journalism in Nigeria, addressing key conceptual clarifications, theoretical frameworks, challenges, and prospects associated with AI utilization in the field. Drawing upon existing literature, the study examines the multifaceted nature of AI, ranging from its conceptual underpinnings to its practical applications in journalism. It utilizes the Technology-Organization-Environment (TOE) framework to analyze the factors influencing AI adoption within Nigerian newsrooms, considering technological, organizational, and environmental contexts. Identifying challenges such as infrastructural limitations, financial constraints, cultural resistance, and ethical considerations, the paper elucidates the complexities inherent in AI integration in Nigerian journalism. These challenges encompass issues of data quality, transparency, bias, and accountability, underscoring the

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need for responsible AI implementation and robust ethical frameworks. Additionally, the paper discusses the prospects offered by AI in enhancing journalistic efficiency, facilitating data-driven reporting, personalizing news delivery, and combating misinformation. By leveraging AI for fact-checking, multilingual reporting, predictive analytics, and automated content generation, Nigerian journalists can innovate and adapt to the evolving media landscape. Moreover, AI presents opportunities for improving audience engagement, storytelling, collaboration, and addressing bias and ethics concerns. Embracing AI in journalism also creates educational pathways for aspiring journalists, fostering skill development and innovation in the industry.

Keywords: Challenges, Prospects, Artificial Intelligence, Journalism, Nigeria

Introduction

Technology has been and continues to be a crucial factor influencing the practice of journalism. As outlined by Vaglis and Bratsas (2017), the dynamic shifts in journalism can be directly attributed to advancements in technology. Within this context, Artificial Intelligence (AI) technologies have emerged as an indispensable component, triggering significant transformations within the field of journalism (Galily 2018). Omebring (2016) views technology as an objective force driving changes in journalistic practices and skillsets. Modern media production now demands technology integration, leading to the question of how technology fits into news production. Mark et al (2017) emphasize that AI's role in reporting, content creation, distribution, and audience engagement is growing, with developments in crowdsourcing, brainstorming, and fact-checking tools aiding data collection and structuring. Automation has become pivotal for newsrooms to stay competitive in the industry.

Presently, as noted by Waleed and Mohamed (2019, p.43), readers can access articles entirely authored by non-human journalists. A prime example is the Washington Post's AI technology named "Heliograph," which supported their editorial team during the 2016 Summer Olympics in Rio. Subsequently, "Heliograph" generated around 850 articles, predominantly covering politics and sports. A 2018 Reuters report, "Media, Trends and Technology Expectations in 2018," based on a survey of various media outlets, conducted

by Newman (2018), reveals that nearly three-quarters of respondents utilize artificial intelligence in their production processes. Concurrently, projects are being developed to enhance AI's use for content improvement, more efficient marketing, cost-effectiveness, data validation automation, and swift data categorization.

Jung et al's study in 2017 titled "Intrusion of software robots into journalism: The public's and journalists' perceptions of news written by algorithms and human journalists" underscores that the audience tends to place more trust in news produced by software-driven algorithms than by human journalists. Zangana (2017) encapsulates the evolving relationship between technology and content creation within modern newsrooms, highlighting how programmers and journalists collaborate more closely, with journalists assuming programming roles and vice versa. It is light of the above that this study seeks to challenges and prospects of artificial intelligence in Nigerian Journalism Practice.

Conceptual Clarification

Artificial Intelligence

The term Artificial Intelligence is one of the trending concepts in contemporary literature. In other words, Artificial Intelligence is a subject matter that scholars in different fields of endeavor are currently trying to harness it importance and applicability in their unique fields of endeavor. According to Manning (2022), Artificial Intelligence (AI), is a term coined by emeritus Stanford Professor John McCarthy in 1955, was defined by him as “the science and engineering of making intelligent machines”. Even though in the past, most research on AI prioritizes the ability of humans to program machines to act in an intelligent manner, such as playing chess, whereas in the present day, the emphasis is on the ability of machines to learn, at least in part, in a manner analogous to human beings (Manning 2022).

The term Artificial Intelligence is defined differently by different scholars. According to Pereira, Hadjielias, Christofi,, & Vrontis, (2023) Artificial intelligence has to do with a branch of computer/mathematical science that solely focuses on creating intelligent machines that have the potency to perform diverse task that requires human intelligence. These machines are built in such a way that they reason about information, perceive their environment and also learn from previous experiences. The sole purpose of Artificial Intelligence experts is to develop algorithms and models that can possible replicate and stimulate cognitive functions, such as problem solving (Hussain, 2023). The above suggest

that the goal of artificial intelligence (AI) experts is to enable machines to think like humans, but in a way that surpasses the human way of thinking (Misselhorn, 2018). The goal of AI is to empower machines with the ability to autonomously collect and process data from their environment in order to make decisions and solve problems, as well as to perform other tasks where human thought is required (Von krogh, 2018) AI is increasingly integrated into workflows to enhance task execution and productivity (Singh, 2018).

Artificial Intelligence (AI) finds application across a multitude of sectors in modern society. In advanced nations, AI is integrated into virtually all sectors, encompassing industries, manufacturing, education, banking, medicine, government, oil services, shipping, creative organizations, journalism, and various other fields. It plays a pivotal role in project design and modeling, often providing solutions that guide decision-making within organizations.

Hintze (2016) posits that sentient and intelligent machines are poised on the brink of realization. However, a White House report suggests that machines have yet to exhibit broadly applicable intelligence comparable to or surpassing human capabilities. Nevertheless, the report predicts that machines will increasingly outperform humans in various tasks. Hintze further highlights mainstream AI tools categorized as machine learning and deep learning, which excel in tasks like "Jeopardy" and even surpass human Go masters. These technologies are adept at handling vast volumes of data and performing complex calculations with remarkable speed. Notwithstanding these advancements, experts have identified four foundational types of AI:

1. **Reactive Machines:** Reactive machines represent the most basic form of artificial intelligence. They lack the capacity to form memories or draw upon past experiences to make current decisions. A classic illustration is Deep Blue, IBM's chess-playing supercomputer, which famously defeated international grandmaster Gary Kasparov in the late 1990s. In this form of intelligence, the computer interacts with the world directly, devoid of internal conceptualization. Intelligent machines of this kind lack comprehensive understanding of the world and lack specialized concepts for specific tasks. Innovations in Deep Blue's design aimed not at expanding its knowledge but rather at refining its decision-making by evaluating past outcomes.
2. **Limited Memory Machines:** Limited memory machines retain data for brief durations and can utilize it temporarily. However, they cannot accumulate this data as part of a broader experiential repository. Many autonomous cars employ limited

memory technology to monitor the speeds and trajectories of other vehicles. These observations are integrated into the autonomous car's pre-programmed representation of the world, encompassing lane markings, traffic signals, and other critical elements such as road curves. As Ray (2018) notes, these machines store transient information about the past, unlike human drivers who accumulate experiences over time.

3. **Theory of Mind Machines:** The concept of theory of mind machines signifies a crucial division between existing machines and those envisioned for the future. Humans possess thoughts, emotions, memories, and mental models that shape their behavior, a phenomenon termed "theory of mind" in psychology. Researchers in artificial intelligence aspire to create machines that mimic these mental models, constructing representations of the world and comprehending the thoughts and emotions of other entities. Their goal is to design computers capable of relating to humans, discerning human intelligence, and understanding how individual emotions are influenced by external events and the surrounding environment. Human societies rely on emotional and psychological attributes to facilitate social interactions and relationships, and it is presumed that for AI systems to become more human-like, they must adapt their behavior to reflect an understanding of human thoughts, feelings, and expectations.
4. **Self-Awareness Machines:** The notion of self-awareness machines evokes images found in science fiction movies. It represents the ultimate stage in AI development when systems can autonomously construct representations of themselves and their surroundings. As Ray (2018) emphasizes, AI enthusiasts regard these machines as the ultimate goal of AI development. Self-aware machines, much like humans, possess self-awareness, comprehending their identity, internal states, and the ability to anticipate the feelings of others. Achieving genuine self-awareness necessitates a deep understanding of memory, learning, and decision-making based on past experiences. Whether machines can truly attain self-awareness remains a philosophical question. While the concept exists, it remains rooted in the realm of fantasy and science fiction, with practical realization seeming remote.

These diverse classifications of AI illustrate the evolving landscape of artificial intelligence, highlighting the potential and challenges inherent in the quest to create increasingly intelligent and sophisticated machines.

Theoretical Framework

The Technology-Organization-Environment (TOE) framework was propounded by Tornatzky and Fleisher in 1990 (Al Hadwer, et'al, 2021). The theory explains the factors impacting technology adoption and its likelihood. TOE delineates how a company's adoption and implementation of technological innovations are shaped by the technological, organizational, and environmental contexts (Tornatzky and Fleisher, 1990).

According to the theorists, the organizational context pertains to the firm's characteristics and resources, including size, centralization, formalization, managerial structure, human resources, slack resources, and employee linkages. On the other hand, the environmental context encompasses industry size and structure, competitors, macroeconomic conditions, and the regulatory environment (Tornatzky and Fleisher, 1990). These three components act as "both constraints and opportunities for technological innovation" (Tornatzky and Fleisher, 1990, p. 154), influencing how a firm perceives the necessity for, seeks, and embraces new technology.

In the context of the study, the technological aspect corresponds to the integration of artificial intelligence tools and practices within journalism. This includes the adoption of AI-driven technologies for news gathering, content creation, and dissemination by broadcast journalists in Nigeria. The internal technologies involve the tools used within the newsrooms, while external technologies encompass broader trends in AI implementation in the field of journalism globally.

The organizational context involves exploring how the characteristics and resources of broadcast organizations in Nigeria influence the adoption of AI in journalism. Factors such as the size of the broadcasting firms, their managerial structures, human resources, and the degree of formalization play a crucial role in determining the extent to which AI technologies are integrated into journalistic practices.

Examining the environmental context is vital for understanding the broader industry dynamics and external factors influencing the adoption of AI in journalism in Nigeria. This includes assessing the size and structure of the media industry in the state, the competitive landscape among media organizations, the macroeconomic conditions affecting the industry, and the regulatory environment governing journalism practices. Understanding these external factors is crucial for comprehending the challenges and opportunities that journalists and media organizations face in adopting AI technologies.

The TOE framework suggests that these three contexts, technological, organizational, and environmental, present both constraints and opportunities for technological innovation. In the case of the adoption of AI in journalism in Nigeria the study may uncover challenges faced by broadcast journalists, such as resource constraints, resistance to change, and ethical considerations related to AI implementation. Simultaneously, it may identify opportunities, such as improving efficiency in news production, enhancing content quality, and staying competitive in the evolving media landscape.

Challenges of Artificial Intelligence Utilization in Journalism in Nigeria

The utilization of artificial intelligence (AI) in the newsrooms of Nigeria is a subject of growing concern. It's often said that Nigeria may take at least eleven years to catch up with the global advancements in AI integration, as highlighted by experts (Olanrewaju, 2018; Ndiomewese, 2017). This lag in AI adoption can be attributed to various pressing challenges and barriers inherent in the Nigerian context.

One of the most fundamental challenges faced by newsrooms in Nigeria is the erratic supply of electricity (Nnamdi, & Nwanyanwu, 2021). The consistent power supply is critical for effectively powering the AI applications that are becoming increasingly essential in modern journalism. AI relies heavily on computational processes, and frequent power outages disrupt the seamless operation of AI tools, making them unreliable in a newsroom setting.

Furthermore, there is a dearth of adequate infrastructure to support the integration of AI into newsrooms. AI systems require substantial computing power, storage, and network capabilities. Without the necessary infrastructure, implementing AI tools becomes a daunting task. The lack of investment in these critical areas hinders the progress of AI adoption. (Nnamdi, & Nwanyanwu, 2021)

Financial constraints are another significant roadblock to the incorporation of AI in Nigerian newsrooms. Purchasing and maintaining AI equipment, including hardware and software, can be expensive. For many media organizations in Nigeria, allocating the required funds for such investments is a significant challenge, especially given the already strained financial conditions they often operate under (Olanrewaju, 2018).

Cultural and socio-economic factors also play a substantial role in inhibiting the adoption of AI in newsrooms. These factors can encompass resistance to change, traditional work practices, and the perception that AI might replace human jobs. This resistance to change

can further slowdown the integration of AI tools into the journalistic process (Nnamdi, & Nwanyanwu, 2021).

The cost of internet connection poses yet another obstacle. AI often requires a high-speed and stable internet connection for data retrieval, analysis, and sharing (Ndiomewese (2017). In Nigeria, where internet infrastructure is still developing and access can be costly, this poses a significant challenge. Moreover, there is a shortage of skilled individuals who can effectively handle AI tools. The training of AI handlers is an expensive and time-consuming process, and it can be challenging to find professionals with the necessary expertise in AI and journalism.

Nigeria, like many other countries, has been slow in adopting technological innovations, as evidenced by its prolonged struggle to successfully implement a digital switch-over system. This inertia in adopting technological advancements contributes to the lag in AI adoption in the country (Olanrewaju, 2018). However, it is crucial to understand that AI is here to stay, and investment in the introduction, training, and retraining of editors and reporters is imperative. As AI tools find their way into newsrooms, journalists must equip themselves with the knowledge and skills needed to harness these new resources for storytelling. This involves not only understanding the ethical implications but also ensuring efficient use.

One significant step in this direction is the development and promotion of shared guidelines among journalists and technologists, focusing on the ethical use of data and the public disclosure of AI methodology. AI should be viewed as an opportunity to apply editorial values and standards to the early stages of new journalistic technology. It's important to acknowledge that AI tools, despite their automation, are created and programmed by humans (Ndiomewese, 2017). This human element introduces the potential for hidden biases in AI algorithms. These biases, often unconscious, can skew the information or analysis provided by AI systems. Therefore, there is a pressing need for concerted and continued efforts to fight hidden bias in AI. Journalists, in particular, have a crucial role to play in this regard.

Journalists should strive to insert transparency into their stories, explaining in familiar and non-technical terms how AI was used to aid in their reporting or production. This not only builds trust with the audience but also provides a window into the journalistic process, showcasing the responsible and ethical use of AI tools (Nnamdi, & Nwanyanwu, 2021).

As with any intricate system, errors can arise, and the ramifications of these errors within AI can be grave. This underscores the vital importance of maintaining human oversight and thoroughly scrutinizing the work of AI systems. Robots, unfortunately, cannot be held accountable for any blunders, as emphasized by various scholars who have delineated two distinct categories of challenges: Professional and Ethical Challenges.

Undermining Creativity: Creativity serves as the cornerstone of journalism, embodying human thought processes, encompassing imaginative writing, interpretation, and more. In this vein, Latar (2018, p. 24) observes that "AI algorithms cannot think beyond the preconceived framework set by their human algorithm designers; they lack the capacity to venture into novel and unforeseen conceptual realms." For example, AI algorithms remain unable to create the ambiance necessary to evoke readers' emotional responses, like laughter (Aljazairi, 2016), or to adeptly respond to scenes of accidents, conduct street interviews, or engage in investigative work. Consequently, analytical skills and creativity remain the principal strengths of journalists when contrasted with algorithms (Van Dalan, 2012).

Lack of Monitoring: Journalism stands as a pivotal force upholding the societal fabric, exerting a significant influence on society. Thus, preserving journalism as a public good in the digital era is of utmost importance. As Latar (2018) contends, "AI algorithms cannot be expected to comprehend and monitor unforeseen and alarming developments; they lack the human capacity to establish connections based on previously unexperienced phenomena."

Bias: The most glaring challenge inherent in automated journalism pertains to the potential for biases to infiltrate AI systems, encompassing gender bias (Larson, 2017) and racial bias. In this context, AI algorithms remain susceptible to look human influence, thereby reflecting the values of their creators. Osoba and Welser (2017, p. 25) assert, "The risks of errors and bias in algorithms and AI will persist as long as artificial agents play an increasingly prominent role in our lives, devoid of regulation." Notably, in 2015, Google issued an apology after its Photos app algorithms erroneously tagged two individuals of African descent as gorillas, likely due to inadequate representation in the training dataset. Moreover, a 2016 investigation by ProPublica revealed that the COMPAS "AI-driven software," designed to assess criminal risk in the US, exhibited bias against individuals of

color, particularly Black offenders, despite more severe criminal histories among White offenders.

Transparency: Transparency, fundamentally, entails openness regarding data collection and usage, along with minimizing unnecessary data gathering. Notably, transparency is indispensable in cultivating reader trust, necessitating the sharing of underlying data for interactive engagement. Leppänen et al. (2017) define transparency as "trust in the system that transforms data into an article." Hence, publishers should distinctly delineate between content authored by human journalists and that composed by intelligent algorithms (Ombelet et al., 2016).

Fact-Checking: In this regard, readers ought to possess insights into the selection of raw data, the rationale behind data choices, verification processes, potential processing of reader personal data, and the mechanisms ensuring source credibility and objectivity.

Fairness: Fairness implies the avoidance of detrimental biases and stereotypes impacting people's lives. Consequently, AI presents a fundamental challenge for journalism, especially when data serves as a means of invading privacy, orchestrating social manipulation, and perpetuating oppression. In October 2018, the International Conference of Data Protection and Privacy Commissioners (ICDPPC) released the Declaration on Ethics and Protection in Artificial Intelligence, affirming the necessity to mitigate unlawful biases and discriminations resulting from AI data usage.

Data Utilization: Presently, ethical dilemmas surround data utilization concerning AI in automated journalism due to the lack of tailored laws and regulations. Wang and Siau (2018) contend that data security and privacy pose substantial risks not only for users but also for developers and governments. Addressing this concern, Monti (2019), in his study titled "Automated Journalism and Freedom of Information: Ethical and Juridical Problems Related to AI in the Press Field," emphasizes the ethical obligation to employ accurate, objective, and precise data.

Data Quality: An overarching concern stemming from the current implementation of AI in newsrooms centers on the quality of utilized data, potentially leading to misleading outcomes, encompassing data sources and accuracy. In this vein, the European Parliament (EP) endorsed a report on Robotics, outlining an Ethical Code of Conduct that underscores key principles, including safeguarding privacy and responsible data use.

Prospects of Artificial Intelligence Utilization in Journalism in Nigeria

In an age characterized by rapid technological advancements, the role of journalism in Nigeria stands at a crucial crossroads. The digital era has ushered in unprecedented challenges and opportunities, and at the heart of this transformation lies the potential of artificial intelligence (AI). As the Nigerian journalism landscape grapples with the demands of the modern world, it is essential to explore the prospects that AI utilization holds for the industry (Olanrewaju, 2018).

While the road ahead is not without obstacles, the integration of AI tools into newsrooms offers a myriad of possibilities that can redefine journalism in Nigeria (Nnamdi & Nwanyanwu, 2021). This discourse endeavors to unravel the promises that AI brings to the field of journalism within the Nigerian context. From efficiency enhancements and data-driven journalism to personalized news delivery and fact-checking, AI holds the key to a future where news reporting is not only accurate and informative but also engaging and tailored to the individual reader (OpenAI, 2023). According to OpenAI, (2023) Artificial Intelligence has the following opportunities to offer in contemporary journalism in Nigeria:

1. Enhanced Efficiency: The integration of AI tools into newsrooms can significantly enhance the efficiency of journalistic processes. AI can swiftly analyze vast datasets, identify patterns, and even draft preliminary reports. This automation allows journalists to focus more on investigative work and storytelling rather than routine, time-consuming tasks (OpenAI, 2023).

2. Data-Driven Journalism: AI can empower journalists with the ability to gather, process, and visualize data on an unprecedented scale. This, in turn, enables data-driven journalism, where insights, trends, and stories can be extracted from complex datasets. AI algorithms can quickly identify correlations, anomalies, and emerging issues, facilitating more informed reporting (OpenAI, 2023).

3. Personalized News Delivery: AI can play a vital role in creating personalized news experiences for readers. By analyzing a user's preferences and behavior, AI can recommend content tailored to individual interests. This not only enhances the reader's experience but also encourages increased engagement with news outlets.

4. Fact-Checking and Verification: Fake news and misinformation are significant concerns in the digital age. AI can be employed for real-time fact-checking and content verification. By cross-referencing information against trusted sources and databases, AI

algorithms can swiftly identify inaccuracies and flag potential misinformation (OpenAI, 2023).

5. Multilingual Reporting: In a diverse country like Nigeria with numerous languages and dialects, AI-powered translation tools can aid in breaking down language barriers. This can broaden the audience reach of Nigerian news outlets, enabling them to communicate effectively with a more diverse demographic.

6. Predictive Analytics: AI-driven predictive analytics can be invaluable in anticipating trends and events. This can be especially useful for investigative reporting and crisis management. By analyzing historical data and real-time information, AI can help journalists forecast developments and prepare accordingly (OpenAI, 2023).

7. Automated Content Generation: While it may raise concerns about job displacement, AI can automate the creation of routine content such as financial reports, weather updates, and sports summaries. This allows human journalists to concentrate on more in-depth, investigative, and analytical reporting.

8. Improved Audience Engagement: AI-powered chatbots and virtual assistants can enhance audience engagement. These chatbots can answer user queries, guide them through news content, and even facilitate real-time interaction during live events or broadcasts.

9. AI-Enhanced Storytelling: Journalists can use AI tools to create more engaging and immersive storytelling experiences. This includes the use of AI-driven data visualization, interactive graphics, and augmented reality elements to make news stories more captivating and informative.

10. Collaboration and Innovation: AI can foster collaboration between journalists and technologists. Working together, they can develop AI solutions customized for the unique challenges of Nigerian journalism. This collaboration can lead to the creation of innovative tools and approaches to storytelling (OpenAI, 2023).

11. Addressing Bias and Ethics: Nigerian journalists, as they embrace AI, have the opportunity to address issues of bias and ethics. By actively working to minimize hidden biases in AI algorithms and maintaining ethical standards in reporting, they can contribute to the responsible use of AI in journalism (OpenAI, 2023).

12. Educational Opportunities: The adoption of AI in newsrooms creates educational opportunities for aspiring journalists. Training and retraining programs can be developed to equip the next generation of Nigerian journalists with the skills to navigate AI tools effectively (OpenAI, 2023).

Conclusion

In conclusion, the findings of this study highlight the challenges and prospects inherent in the integration of artificial intelligence (AI) into Nigerian journalism. While infrastructural limitations, financial constraints, and cultural resistance pose significant hurdles, AI offers transformative potential for enhancing journalistic efficiency, combating misinformation, and fostering audience engagement. By embracing responsible AI implementation and robust ethical frameworks, Nigerian journalists can navigate these challenges and capitalize on the opportunities presented by AI. Moreover, AI opens avenues for innovation, collaboration, and educational advancement within the industry. Moving forward, concerted efforts to address biases, ensure transparency, and uphold ethical standards are imperative to realizing the full potential of AI in Nigerian journalism, ultimately enriching storytelling and nurturing informed public discourse in the digital era.

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