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The Adoption of Artificial Intelligence in Newsrooms in Kenya: a Multi-case Study

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Abstract

The deployment of Artificial Intelligence (AI) in newsrooms is gaining prominence worldwide, with the technology being used to enhance the processes of news gathering, packaging, and distribution. The study was guided by two research questions: what factors drive/hinder(s) the adoption of AI or lack of it in newsrooms in Kenya? Moreover, what opportunities do journalists feel are offered by adopting AI in newsrooms in Kenya? A qualitative research approach and descriptive research design were employed to investigate the adoption of AI in newsrooms in Kenya. British Broadcasting Corporation (BBC-Africa) and Radio Africa Group (RAG) media organizations were the target population. As a research strategy, a multi-case method was employed. The researchers conducted in-depth interviews with newsroom-based participants. A purposive sampling technique was used to select participants for the research. Collected data were analyzed

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thematically. The paper identified six factors driving the adoption of AI or lack of it: management buy-in, cost, technical skills, clarity of user case, perception, and company structure. Further, the study identified three challenges presented by adopting AI: lack of quality data, ethical concerns, and unpredictability of the technology's impact. The study concludes that AI offers excellent opportunities for newsrooms in Kenya to explore. Still, some obstacles need to be addressed before they can benefit fully from the technology. The study projects that human and automated journalism will become closely integrated in the future and recommends that newsrooms in Kenya prepare to embrace AI by laying the foundation for its adoption. Media schools should update curricula to prepare journalists to work with emerging technologies such as AI. Further research is needed to identify the specific skill sets required for Kenyan digital journalists to embrace AI fully. Scholars should investigate how AI can shape new business models given shrinking revenues in the media.

Keywords: Artificial Intelligence, Robot Journalism, Investigative Journalism, Data Journalism, News Media, Technology, and Machine Learning

Introduction

The future and survival of news media business models depend on a company's flexibility and adaptability to emerging technologies, mainly digital technologies and artificial intelligence (AI). The tremendous advancement in communication technologies and integration of artificial intelligence in recent years has dramatically affected the news journalism ecosystems. Traditional media houses have undergone significant reorganization and modifications of newsrooms operations, field and investigative operations, news gathering and writing, and news dissemination and customer engagement by integrating AI and digital technologies. There are three levels of AI integration in media houses depending on the automation of various tasks in the three stages of the news production process: research, production, and dissemination (Munoriyarwa et al., 2021). Further, Munoriyarwa et al. posit that the three levels are: (i) Holistic AI appropriation - where most of the news production functions have been delegated to AI with limited journalist functions, (ii) Technological appropriation - where technological hardware equipped with AI features is used in news gathering but editing and writing still used by humans, and (iii) Partial appropriation - where AI is used for specific functions at different levels of the news production process, and there is considerable human-AI interaction. Most media houses in developed countries have successfully transitioned to the full and partial appropriation of AI, while in developing countries, media houses

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are still struggling with integrating AI (Mutsvairo et al., 2020). Nonetheless, the technological breakthroughs in the last decade have ushered massive changes in the profession of journalism, the news-making process, and news business models. Scholars have looked at the long-term viability of traditional news media revenue models in the face of social media's expansion, market fragmentation, and a highly linked and fast-moving news sector (Dwivedi et al., 2021). Facebook, YouTube, Google, Twitter, and Instagram, as well as digital native news media platforms, have significantly impacted how news is gathered, presented, and distributed (Dowd, 2020; Harper, 2010). Indeed, in today's technology era, a news journalist competes with nearly everyone who owns a digital device and can share information. As aforementioned, the news media industry in the global north is miles and bounds ahead of the global south regarding research and the use of AI in newsrooms. However, with the technological advancement and rise of competing digital native news media, the local traditional and international traditional media houses with branches in the global south have had to "...reflect on the deeper meaning and mission of journalism, as well as the structure and ethics of the news industry in the era of AI…." (Hagendorff, 2020, p.57) within perpetually changing developing world contexts and embrace the integration of AI in news production systems albeit with varying degrees of success and challenges.

In a perpetually changing news ecosystem, embracing and integrating AI use alongside other emerging technologies in news media serves to increase profitability by increasing the efficiency of the news production process. Research has shown that traditional media houses that have been able to integrate and use AI-based news production solutions have reported improvements in producing accurate and objective news items (Pedrero-Esteban & Pérez-Escoda, 2021; Zayani, 2021). Media houses in the global south are also working to catch up with this development. There have been reports of increased use of AI in investigative and data journalism by utilizing machine learning, computer vision, speech recognition, planning, scheduling, optimization, and robotic technologies (Pedrero-Esteban & Pérez-Escoda, 2021; Zayani, 2021). Importantly, investigative and data journalists can use AI technologies like bots and drones with facial recognition to collect data and evidence from safe distances. When they have to tie the pieces of a story together to create interactive videos and infographics, they must use AI-based training programs for graphics, translations, transcription, and video editing.AI has thus been seen as a critical player in elevating the voice of the global south (Pedrero-Esteban & Pérez-Escoda, 2021; Zayani, 2021).

Studies have shown that even with digitalization and the rise of social media remains to be an essential part of public life (Bruhn et al., 2012), and the role of ethical and skilled journalism to provide factual, timely, and relevant news content is indispensable (Ward, 2018). However, digital

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innovations and social media have greatly influenced public social life, including news seeking and consumption behaviors. Indeed, a new news consumer has emerged (Mitchell et al., 2016), one that wants to and can access news in the most convenient times and ways. News items come in diverse forms; weblinks, images, videos, social media posts, written articles shared through social media, Chatting apps (WhatsApp, telegram, etc.), emails, News Apps, or text messages. In this context, family, friends, and people with large social media followings, often termed influencers and celebrities play a more significant role in influencing news consumption behaviors. Despite all these changes, the present-day news consumer still inclines toward traditional news media platforms for news credibility. It, therefore, has been an issue of the traditional news media to consciously integrate audience-focus technological advances that would assure the consumer reliable, credible, and timely news content (Anger, 2018).

Although the emergence of AI and social media has altered the news media landscape and consumption, ethical and professional journalism remains critical in providing reliable, timely, and relevant news information (Nwanyanwu & Nwanyanwu, 2021). From the early times of adoption of AI and the embracement of emerging technologies by media houses in the mid-2000s, the biggest fear in the industry was the future of journalism, given that machines could be programmed to execute any function as humans (Jamil, 2021; Miroshnichenko, 2018; Munoriyarwa et al., 2021; Mutsvairo et al., 2020). Additionally, ethical questions around biased algorithms, data protection, surveillance, and privacy concerns, hacking robots, and lack of clear policies and guidelines on the use, control, and regulation of AI use, especially in the global south, continue to present socio-political barriers to AI integration (Monti, 2019). Nonetheless, AI provides invaluable opportunities for multi-disciplinary collaborations between humans and machines and across different disciplines, including IT, data science, and journalism.

Besides the challenges mentioned above and fears of AI adoption, newsrooms in the African context are affected by other factors. Poor IT infrastructure and skilled technical personnel have limited its wide application in Africa. However, this seems to be changing with emerging digital and cloud-based technologies that have brought the costs down and availability of learning opportunities for people interested in AI and computational journalism (Chege, 2022a; Kothari & Cruikshank, 2022; Mabweazara & Mare, 2021). In Africa, some news organizations have employed AI in their operations to add value to the process of gathering news and disseminating content. Zimbabwe's Controvert Media has been using robots to generate news articles and publish them on the internet (Chronicle, 2017).

East Africa's Nation Media Group (NMG) uses its website's interactive bot named Nation Kiki (NMG, 2018) to engage followers through

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automated alerts and conversations. However, Kiki is no longer in use. The organization has also experimented with Augmented Reality (AR) - a prominent type of technology closely related to AI, which happened during the live unveiling of its new *Nation. Africa* platform (NMG, 2020). AR is an immersive technology in which digital elements such as images, sounds, and text are superimposed over real-life scenes (Houston, 2021). AR uses three-dimensional (3D) imagery to put one in the cinematographer's shoes. To experience it, the viewer needs to have a smartphone or an AR-enabled digital device (Pavlik, 2020). Beyond these two instances, it is unclear whether there is any more use of AI and AR in the media organization or other newsrooms in Kenya.

In this study thus, we sought to examine the barriers, facilitators, and opportunities of adopting AI and its use in the news in the African context. Specifically, we seek to answer two questions: (i) What factors drive or hinder(s) the adoption of AI or lack of it in newsrooms in Kenya? (ii) What opportunities do journalists feel are offered by adopting AI in newsrooms in Kenya?

Methodology

The study adopted a qualitative research approach. This approach helps gain fresh insights into a topic if little research is available (Akhtar, 2016). Qualitative research allowed the researchers to go beyond a surface-level comprehension of the problem to a deeper understanding. Further, it provided a chance to elicit the viewpoints and experiences of the participants, as well as get a better insight into the problem from the perspective of the study participants (Daymon & Holloway, 2010). The researchers adopted a descriptive research design. Babbie (2016) posits that descriptive research design attempts to collect data to describe phenomena, conditions, or populations methodically. It focuses on the research problem's what, when, where, and how rather than the why (Babbie, 2016). Therefore, this study's descriptive research design aided in describing the adoption of AI in newsrooms in Kenya, the factors that drive or hinders its adoption, and the opportunities journalists feel they are offered by adopting AI in the Kenyan newsrooms.

The target population for this study was personnel working in the digital departments of two media houses (BBC and RAG) in Kenya. The rationale is that AI is most likely employed in this segment. Further, the targeted media companies were chosen for the strength of their digital platforms, which include several websites and social media accounts, in addition to traditional journalistic content collecting, packaging, and publication models. The criteria for inclusion in the study were whether they have worked for at least one year as reporters (online writers, social media

journalists), sub-editors, editors (content/growth), graphic designers, and software engineers or web developers. Having this in mind, then, BBC has ten registered journalists in the "Nairobi Digital Hub" while RAG has 35 journalists (MCK, 2020). The two media enterprises' digital sections employ a total of 45 journalists. From this targeted population, 12 key interview informants were obtained (6 from BBC and six RAG). This formed the sample size of the study. Choosing an appropriate sample size in qualitative research has been a conceptual debate (Vasileiou et al., 2018). It is not straightforward, but for a diverse group such as the one targeted in this study, a sample size of between 12 to 20 is recommended (Daymon & Holloway, 2010).

Purposive sampling was utilized in the study to obtain the 12 key interview informants. Therefore, the researchers selected participants and sites to examine because they can help him/her better comprehend the research problem and core phenomena in the study (Creswell & Poth, 2018). In other words, the participants have knowledge, skills, expertise, and experience on the study problem.

The researchers employed a multi-case strategy and in-depth interviews with key informants to generate data. A case study is a methodological strategy that entails an in-depth examination of an expressly limited entity using various data gathering methods to comprehensively obtain information on how the entity runs or performs (Mills et al., 2010). Mills et al. further argue that case study research in which numerous instrumental bounded situations are selected to generate a more in-depth knowledge of the phenomenon than a single case can offer is a multiple-case study or collective case study. The study focused on two media houses operating in the same environment but with different outlooks and approaches. One of the media organizations under study has an international focus (BBC), while the other has a national outlook (RAG). Therefore, the multi-case method was suitable because it helped put the participants' experiences into perspective and helped the researchers understand the adoption of AI in the two distinct settings.

In-depth interviews were used to help better understand the extent of the adoption of AI in newsrooms in Kenya and the opportunities presented by adopting the technology. Hammond and Wellington (2012) note that the interviewing technique allows for probing perspectives and clarifying issues from the participants. This is especially useful for a subject as new as AI in newsrooms in Kenya. Interviews with the key informants were conducted until they reached saturation point by the ninth interview. However, the researchers continued until the eleventh interview to triangulate and confirm the first-hand accounts of interactions with AI systems in newsrooms. Saturation has been widely accepted as a methodological principle when conducting qualitative research (Saunders et al., 2018). It occurs when a further collection of data is

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unnecessary since data is redundant, and any additional data may not lead to new themes (Given, 2016).

Data were recorded using the strategy of taking notes during the interviews. This made data analysis easier because the data was readily available and had already been sorted by the interviewer into relevant categories.

The data were analyzed using a thematic analysis technique. Data analysis is the systematic process of transcribing, compiling, coding, and publishing data so that it is understandable and available to the reader for purposes of interpretation and discussion. Address the research objectives involves assigning categories and grouping emergent topics into themes (Jwan & Ong'ondo, 2011). The following steps were included in the analysis (thematic) framework: (a) familiarisation, (b) coding and producing themes, (c) indexing and charting, and (d) mapping and interpretation. Following the analysis, the data was presented in the form of themes.

The Researchers complied with all necessary ethical research requirements. The study was conducted at BBC and RAG newsrooms within Nairobi County from June 2021 to February 2022.

Findings and Discussions

In this study, we aimed to understand the extent of the use of AI in newsrooms in Kenya, establish the factors that drive or hinder the adoption of AI in the newsrooms, and explore the opportunities that AI presents to news journalists in African contexts. In the study, we conducted in-depth interviews with 12 Key informants (journalists) drawn from two major media houses operating in Kenya. The media houses are - BBC-Africa and a locally owned Radio Africa Group. Between these two media houses, they run three television stations, seven radio stations, two newspapers, and four online news outlets. The TV stations are BBC international, Kiss TV, and East TV. BBC International is a 24-hour international news network broadcasting from Kenya and other African countries in Kenya. The Kenyan office usually covers the East, central, and horn of Africa. Kiss TV and East TV are owned by RAG and reach Kenyan urban youth and Asian communities, respectively (https://radioafricagroup.co.ke/tv-stations/). The BBC has BBC Radio and BBC Kiswahili radio stations, while the RAG runs five radio stations (Kiss 100, Classic 105, East FM, Radio Jambo, and Smooth FM). Kiss100 and Classic105, broadcast in English and targeted youths and the general population, respectively. East FM targets the Asian communities, Radio Jambo broadcasts in Kiswahili with a national listenership, and Smooth Fm targets affluent and successful women who are settled in life and focus heavily on family, health, and education (https://radioafricagroup.co.ke/radio-stations/). The BBC also has vibrant online broadcasting and interactive news

websites. RAG runs two newspapers; The Star newspaper, both online and print, and *Mpasho*, an online entertainment news outlet. Both media houses are also actively engaged in social media platforms for news outlets and audience engagement. The interviewees included reporters, editors, producers,

The use of AI in Kenyan Newsrooms

AI is gaining prominence in newsrooms in different parts of the world (De Sibandze, 2019). According to this study, newsrooms in Kenya are catching up by adopting the technology in varying degrees to meet different needs – from gathering news to packaging it to ensure that it is appealing to the users to publishing it in a manner that will attract audiences to their online platforms as has been the case in newsrooms in other countries in the world (Thurman et al., 2019). The study identified key factors that are either driving the implementation of AI or the lack of it in newsrooms in Kenya. These include management buy-in, cost, technical skills, clarity of user case, perception, and company structure. Further, the study identified three challenges presented by adopting AI: lack of quality data, ethical concerns, and unpredictability of the technology's impact. The study concludes that AI offers excellent opportunities for newsrooms in Kenya to explore. However, some obstacles must be addressed before they can fully benefit from the technology. The study projects that human and automated journalism will become closely integrated in the future and recommends that newsrooms in Kenya prepare to embrace AI by laying the foundation for its adoption.

The key informants interviewed in the study were well conversant with the term AI, recognizing it as the use of computer technologies to mimic human intelligence and perform human-like tasks without or with minimal human intervention. However, some interviewed journalists described how they use technology (AI) daily. Nevertheless, they do not recognize it as AI, highlighting a technological gap among practicing journalists. There is a disconnect between the increased AI use in producing and disseminating news while the news gathering still depends on traditional methods. Even among those who were well conversant with the use of AI, gaps in data mining and management expertise, programming, and proper integration of AI in journalism operations (from newsgathering to packaging and publishing of content) were highlighted as critical challenges. This also presented opportunities for media houses to pursue cross-collaboration between media houses, the AI, and the IT industries to improve the adoption and integration of AI in newsrooms.

When asked how AI had been used in the newsrooms, the responses from the key informants indicated that AI had been used in three main ways. One is in news gathering and content generation through identifying information trends to identify potential breaking news using flagging alerts,

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data analytics, and machine learning for investigative and business news. While the respondents noted that full integration of AI use in the newsroom is/has been a slow process, they also noted that this slow integration of AI has been speeding up in the recent past. Soon survival of the news media in Kenya, and software engineers like in other countries, will depend on how best the media houses can adapt to and integrate emerging technologies in the news production processes of research, production, and dissemination (Belair-Gagnon & Revers, 2018).

The use of flagging alerts and robotic journalists (bots) has been gaining use in the recent past, especially for scanning social media and other news platforms to map potential breaking news in contexts of conflicts and recently with limited movement due to COVID-19 restrictions (Carlson, 2015; Schapals & Porlezza, 2020). Eight of the study key informants noted that AI was used to identify topics or issues that audiences are talking about online. The information was then used to craft stories likely to attract audiences to the organization's website or social media platforms. One participant pointed out that some of the tools used to achieve this goal were not owned by the specific newsrooms, such as Google Trends, which analyses the popularity of issues being searched online by users in different regions. According to one participant, their organization used tools like Data Miner and Crowd Tangle to track online conversations, reactions to specific tweets, and the pieces of information making more impressions:

> *We use the tools to look at social chatter, what people think about which tweets, and which pieces of information have gotten much attention, and then try and pick that information and then relate it to news happening in the region.*

Since the sampled media houses work across different languages and target varying populations in terms of age, education, and socio-economic status, automation – auto-translation, auto writing, and auto design - has eased the recreation of one story for different languages and contexts without having the writers or designers to make multiple templates. As one of the participants noted:

> *To replicate the English version to Kiswahili, I need to run the plugin, which translates automatically. And then, you know, I just do a few edits design-wise because maybe some languages may have run over the text.*

The adoption of AI in news gathering has eased the process of news production itself. However, this has not made humans indispensable. Careful analysis and assessment of content clarity, quality, and biases are required

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with these emergent technologies (Carlson, 2015). For instance, some of the study participants for the BBC-Africa, which broadcasts in over 12 languages in the East and Horn of Africa, argued that human intervention was needed to check whether the auto-translation was successful because sometimes there could be hitches. They said that:

> *Most of our languages are wordier compared to English. So that requires the eye of the designer or the journalists. It is easier than when we had to translate content manually. However, we still have to develop language databases to help with translation. A challenge for us in Africa is that we don't have a database of the native languages we broadcast.*

This highlights a limitation of AI concerning languages and a long acknowledgment of inbuilt biases in AI technologies that easily reproduce racial, gender, and class biases. As Marconi (2020) notes, AI can make mistakes that originate from biased data that was used to train it, pointing out that the outcome of AI models is only as good as the input data. Reproduction of these biases in the news content may carry potential financial, legal, and social liabilities. However, factors determining the newsworthiness of specific contents are also deeply socio-political and difficult to encode in most AI technologies (Stray, 2019). Furthermore, this may explain why we saw only partial appropriation of AI – the use of AI for only specific purposes (Munoriyarwa et al., 2021) - in the media houses that were engaged in this study.

AI has also been instrumental in driving management, efficient interrogation, and integration of data-driven analyses and visual storytelling in newsrooms (Mutsvairo et al., 2020). In this study, data visualization and presentation appeared as the other key use of AI in newsrooms in Kenya. In this case, the respondents described how they could develop single graphic templates that are used to automatically replicate, revise and repost visual contents based on prevailing news ecosystems. For instance, during the COVID-19 pandemic, both BBC and RAG utilized in-house developed and open-source software to gather local, regional, and global updates on infection and death rates, automatically conduct statistical and thematic analysis, and create user-friendly visual infographics.

We also established that AI is used in news dissemination to enhance online audiences' engagement and interaction with content. Firstly, AI was employed to automate sharing and scheduling of content on social media. Both media houses used bots that automatically picked stories from the system and shared them on social media platforms such as Twitter, Instagram, and Facebook. According to one participant from the BBC-Africa, the tool uses an algorithm to check the traffic on the organization's main website. It picks the

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most popular stories for sharing on social media. This ensures that the most relevant stories are shared to push for more online reach and attract more traffic. Secondly, AI is used to develop user-generated social media content to piece together details of how an event unfolded as reported online by eyewitnesses. As one respondent noted, this has been interesting to watch as a reporter, whereby the news consumers have been drawn in as active participants in the news-making process. However, it has necessitated the need to employ more scrutiny and verification of these contents for validity and reliability in the age of misinformation and fake news (Rashidian et al., 2019). Beyond just improving the customer experience, AI has also been used to evaluate the performance of news consumption, especially on online platforms. This was a response to changing audience consumption habits in recent years, making online engagement a key parameter for measuring newsroom performance. Before digital disruption occurred, newsrooms would measure performances by the number of newspaper copies sold and the number of people listening to the radio or watching television. However, competition for reach in the online space has made it increasingly crucial for newsroom operators in Kenya to use tools that can help in attracting traffic to their online content, retain audiences on the page, and increase their ability to share with others on social media. The use of machine learning in this context has been used in other countries to crunch large datasets on consumer trends and online behavior to evaluate user engagement and content performance and inform strategies to improve content quality.

Barriers and facilitators of adoption and use of AI in Kenyan media houses

The research identified several factors driving the adoption of AI or lack of it in newsrooms in Kenya. According to the study key informants, management buy-in (willingness of the leadership of a news organization to adopt AI) plays a massive role in determining the adoption of AI in the newsrooms. For organizations with competing priorities, sometimes AI may not be seen as a worthwhile investment primarily due to initial investment costs in terms of infrastructure, training of staff, and required reorganization of news operations. In the current precarious economic climate:

> *You find people (leadership) worried about other things right now, like being concerned about the day-to-day running and ensuring that everything works within the organization.*

One of the respondents, on the extent of adoption of AI in the newsroom, has also been influenced by the AI skepticism from mid-level management (editors and producers) who noted:

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> *They are afraid that AI will replace skilled humans with invaluable experience in journalism. But we also must acknowledge that ethical and practical issues are yet to be fully addressed before fully integrating automated news-making.*

This cynicism is not new, and similar sentiments have been seen in studies in South Africa (Munoriyarwa et al., 2021) and Nigeria (Guanah et al., 2020; Nwanyanwu & Nwanyanwu, 2021). However, where company structure, leadership, and culture are open to innovation and trying novel technologies, the implementation of AI has been successful and eased the work of journalists and other production team members. For instance, automating and scheduling dissemination of news have helped tackle the challenges of limited human resources and ensured that news is delivered timely, their performance is monitored, and using robot journalists, the headlines can be edited automatically to improve users' experience.

The cost of developing, implementing, and managing AI also emerged as an important factor influencing AI adoption. As a senior manager at RAG noted, the initial cost of setting up the IT infrastructure, training and hiring the right talent, and required reorganization of the newsrooms is quite high, and the companies have to make a cost-benefit analysis to assess the feasibility of and sustainability of its use against other competing interests. For the case of BBC, adoption of the AI seemed easier since technology and skills transfer from the parent company was more accessible, while for some of the media outlets under RAG:

> *First, you must consider the return on investment in this thing? … One of the things that I have seen from my organization as an obstacle is the cost factor.*

Indeed as (Munoriyarwa et al., 2021) noted in their study on the use of AI in South African newsrooms, media houses with well-endowed international parent companies were able to adapt and integrate a holistic use of AI than local media houses. Thus, it is unsurprising that the BBC - Africa had diverse, successful use of AI in the newsrooms compared to RAG.

The availability of people with the right technical skills to develop and manage AI systems emerged as a key factor driving the adoption of AI systems. This was because different AI models will require different skill sets. The study participants highlighted an existing gap between developers and most newsroom staff. To this end, most journalists have limited technical skills to create AI models, yet they form the most significant percentage of newsroom employees. One participant gave a glimpse of how their team is structured to factor in talent with the right technical skills:

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> *This organization is a bit more equipped… our visual journalism team includes four members, three of whom are not journalists but a software developer, a social media visual artist, and the User Experience, User Interface (UX/UI) expert.*

Moreover, the talent with the right skill is in demand from other industries and not just the media, and some of those organizations have the capacity and budget to pay for the right talent. One participant narrated a particular experience with hiring a developer for their newsroom:

> *When our developer left, it took almost three years to have them replaced. And then when we got a new one, they were poached by a competitor just after four months.*

This is not only a challenge that media houses face but since the expansion of remote working, even non-media local companies and tech start-ups are competing with international companies that can offer remarkably high salaries to local talent with options for remote working (Roussi, 2021).

Finally, the study participants highlighted the need for deliberate cross-collaboration between the management, tech specialists, and journalists to promote the adoption of AI. According to one of the study participants, this would ensure all team members with diverse backgrounds and roles in the news-making process are well informed of the needs and working of the others. This will enhance creativity and skills transfer. This co-learning should extend to senior management. Njoki Chege notes in her column on the Nation Daily that retooling and reskilling editors mean nothing if senior leadership and boards do not appreciate the value of AI (Chege, 2022b).

The perception of individual journalists on the impact of AI on their jobs was also identified as a factor that can drive the implementation of AI or lack of it in newsrooms in Kenya. Most participants interviewed for this study said the digital disruption witnessed in recent years had prompted them to think beyond their traditional roles and focus on what more they could offer. This means they are more open to adopting new technologies in their work. Brokensha (2020), and Kim and Kim (2018) note that most journalists view AI as more of a friend rather than a foe and that adoption of the technology will make their work easier and help improve the quality of their reporting (Guanah et al., 2020). Some participants stated that AI could mean job losses in some sectors in the newsroom, which is in line with the argument by Lindén (2017), who observes that certain roles in the newsroom could be eliminated by large-scale application of AI. The roles that face elimination by the deployment of AI include entry-level journalism jobs such as interpreting company financial reports, interviewing the authorities, and making reports after watching sports

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competitions. However, as some jobs face the threat of extinction, other jobs are also created. This finding supports Miroshnichenko's (2018) view that other jobs that were non-existent before would be created by adopting the technology (AI) in newsrooms. These roles include software engineers, data miners, analysts, and coders. This study found that some of these roles have already been created in newsrooms in Kenya that are keen on adopting AI. Some interviewees were data analysts, while others were software and web developers.

Opportunities

Despite the challenges posed by adopting AI in newsrooms in Kenya, the study also established that there are opportunities for exploration presented by the technology (AI). These opportunities are data mining and management, journalism operations from newsgathering to packaging and publishing content, and partnerships for collaborations between media houses and other organizations. Gadzala (2018) posits that the deployment of AI in the African context will depend on certain factors being put in place by the implementors:

> *Opportunities for AI in Africa remain confined to a handful of countries where critical factors for success are quickly coming together to bypass outstanding challenges and bottlenecks. These factors are converging more gradually or not at all in other African countries. Despite enthusiasm about AI being able to help African countries "leapfrog" their economic development, progress in certain areas in data availability and privacy; skills and training; in digital infrastructure must first happen before AI can be meaningfully mastered and deployed.*

This study established a gap in finding quality data to train AI models locally compared to western countries. This comes when the west is looking to countries such as Kenya to help them refine data for their AI systems. Kshetri (2020) notes that big companies in the west, such as Amazon, Microsoft, and others, are turning to develop countries such as India, the Philippines, and Kenya for data labeling to improve training for their AI models to enhance shopper's online experience and improve on technology for self-driving cars. News organizations in Kenya can jump on this opportunity to label and digitize data to implement AI for themselves and sell the data to external bodies at a profit. This study suggests that newsrooms in Kenya are well positioned to fill the gap in the lack of quality data since they have large volumes of data that can only be found in such organizations, and they can earn extra income through it.

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The areas in which newsrooms in Kenya are deploying AI are few compared to how the technology is being deployed in other newsrooms located in different parts of the world. AI has been deployed to transcribe video-to-text (Norton, 2017) and deal with misinformation (Biswal & Gouda, 2020), areas where AI is yet to be deployed in Kenyan newsrooms as established by this study. AI has also been used to personalize content in newsrooms in twelve European countries, including Germany, the Netherlands, and Finland, where algorithms are being used to deliver 'tailor-made' content to users (Bodó, 2019). A robot has been deployed to read the news in China (Baraniuk, 2018), while in Zimbabwe, AI has been used to automatically generate news articles (Chronicle, 2017). Although the circumstances in newsrooms in those other parts of the world may be different from the Kenyan context, how AI has been applied indicates many potential areas where newsrooms in Kenya can explore AI. Most journalists interviewed indicated that the translation of stories, text, and videos from English to local languages or even local languages to English can come in handy in how fast the journalists write and publish stories online. The study's findings are consistent with research conducted in Pakistani newsrooms that journalists were optimistic that AI could transform the practice of journalism (Jamil, 2021). The study identified tracking social media posts and other sources for breaking or developing news stories and trending topics as a potential area where AI can be applied. The information gathered can develop news stories that resonate well with the audience and increase engagement on the channel's digital platforms.

Conclusion

The study confirms that newsrooms in Kenya are catching up with their counterparts in other parts of the world by deploying AI to enhance their news processes: from news gathering to content packaging and distribution. The deployment of AI indicates some acceptance of the technology in the newsrooms. The research forms a basis for understanding how AI has been adopted in newsrooms in Kenya and can be used to draw comparisons on the deployment of the technology in the media sector in other developing countries.

The study concludes that AI offers great opportunities for newsrooms in Kenya to explore as they navigate the disruption brought about by digital platforms in consuming content and income-generating models. However, some obstacles need to be addressed for the media organizations to benefit fully from AI. These obstacles include the cost of the technology, the lack of quality data to train AI models, and the lack of technical skills to implement and maintain the systems.

The study projects that human and automated journalism will become closely integrated in the future. Under the present circumstances, as highlighted in this study, AI may not be a threat to existing journalism roles in the newsroom due to the likely challenges that its implementation may face. This position could change as AI deployment factors become more favorable in the coming years. Adoption of the technology will be witnessed in more ways in the country's media landscape to varying degrees of success. Therefore, journalists in Kenya need to acknowledge how AI is changing the division of labor in media in other parts of the world and adequately prepare to respond when that happens. Journalists who do routine tasks which are likely to be taken up by AI can equip themselves to handle the change by gaining new skill sets and getting accustomed to roles that AI algorithms cannot perform, such as investigative reporting, in-depth analysis, interpreting data, and explaining the reasons behind certain occurrences in the society

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