Adopting Artificial Intelligence to Journalistic Practices in Nigeria: Challenges and Way Forward

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Abstract

Artificial Intelligence (AI) has grown worldwide and is applied in different sectors to quicken production processes, increase productivity, ensure accuracy and ease in ways businesses are run. Journalism has benefited from AI as robots engage in journalistic processes, and produce results quickly in broadcast and print media types. Despite its popularity, application of AI to journalistic practice in Nigeria is scant as a consequence of various factors. This study is conceptual in nature and used qualitative methods to seek results. Expert views and opinions were used to provide information required for the study. It sought to find out challenges which can hinder successful application of AI to journalism practice in Nigeria. Media richness and technological determinism theories underpinned the study as they dealt with influence of communication technologies on production and impact on societies. AI is pertinent to journalism in order for newsrooms to remain competitive and facilitate job opportunities. Despite its advantages, AI poses different kinds of challenges which affect the newsroom. While some of these may be technical, others are structural and deal with governance. Further, there are professional and fundamental issues which include basic knowledge and practice which hinder growth and spread of application of AI to journalism in Nigeria and other sub-Saharan African countries. Therefore, recommendations were made which include the fact that there is need for a re-orientation of perceptions on the importance of AI by Governments and journalists themselves to ensure its use to engender productivity in the sector.

Keywords: Artificial Intelligence, journalism practice, knowledge & professionalism

Introduction

In a recent coverage on CNN, highlights of application of artificial intelligence, AI, in classrooms in Abu Dhabi, UAE was done. According to teachers and students interviewed, AI was used to ensure proper understanding of concepts which are taught in schools. And these applications are tailored to schools' curricula. 25,000 students at 57 public schools and in two private schools are beneficiary of this in UAE. According to the reporter, subjects such as maths, English and other core science subjects are the focus. According to the CEO of Alef Education, the start-ups which is carrying out this intervention, Geoffrey Alphonso,

said that "millions of data points were captured on a daily basis, which is practically difficult for human to process such data points" (Alkhalisi, 05 Mar, 2019). For students, this means that a concept can be repeated severally in a personalized manner to ensure that they can easily understand it. In another instance, an IBM computer, took on Harish Nataruyan, a grand finalist in the 2016, World Debating Championship, in a debate. Though the AI lost, Mr. Nataruyan observed that AI spoke with emotions, which appeals to humans. He further predicted that AI Technology is such that in a few years time, it will be competing with the best in any field (Julia Chatterley, CNN, 12/02/2019).

It was important to begin this chapter with these illustrations, with the aim to provide an insight into how AI works, and the wide range and scope within which it can be deployed. Developments concerning the invention and growth of AI had existed earlier as myths found in Greek and Roman mythologies, but with time, it was invented but not with the expectations had for it. Within our context in Nigeria, development and application of this technology is scant, and it is not popular either. Emergence of new media technologies has grown to its dominance and prominence in different spheres of society, and this is reflected in the use of the *Internet*as a hub on which various activities including governance, businesses, politics and entertainment are run. Growth and developments of ICTs further gave rise to social media applications which run on the *Internet* protocol such as *Facebook*, *Twitter*, *Instagram*, *Whatsapp*, Email and a host of online publications, media websites and coming into being of bloggers and citizen journalists who source, create and distribute contents of different genres for various communities on *cyberspace*.

Before the advent of information and communication technologies, attempts had been made to develop *Artificial Intelligence*. In the words of Lewis (2014), "the idea of inanimate objects becoming active and intelligent beings is as old as human history". There are Greek myths about robots, while attempts were made by the Egyptians and Chinese engineers to build up automations. The term Artificial intelligence was first coined by John McCarthy at New Hampshire in 1956. Smith, McGuire, Huang and Yang (2006) observe that, "the study of AI is as elusive as it is a large and nebulous subject which ranges from machines truly capable of thinking, to search algorithms used to play board games". The main advances have been those in search algorithms, machine learning algorithms and integrating statistical analysis into understanding the World at large (Smith, *et al* 2006).

Continuing, Smith, *et al* (2006) observe that *Expert Systems*, a subset of AI first emerged in the early 1950s when Rand-Carnegie developed the general problem solver, to deal with theorems proof, geometric problems and chess playing. In the 1960s and 1970s, *Expert Systems* were increasingly used in industrial applications. Some of the famous applications during the period include DENDRAL (a chemical structure analyzer), XCON (a computer hardware configuration system), MYCIN (a medical diagnosis system) and ACE (AT&T's cable maintenance system). PROLOG, as an alternative to LISP in logic programming was created in 1972 and designed to handle computational linguistics, especially natural language processing. At this point, AI was considered a direct threat to humans in various aspects, especially within the labour sphere. Citing Metaxiotis and colleague, Smith, *et al* (2006) observe that *Expert Systems* are the major focus when considering how important it is when both decision support that provides options and issues to decision makers especially where people can make decisions above their level knowledge and experience. Unlike humans, *Expert Systems* have the distinct advantage to store permanently knowledge and expertise and in most cases offers a consistent level of consultation.

According to Lewis (2014), the period between 1974 and 1980 is known as the 'AI winter'. This was the time that attention diverted to computing systems, emergence of IBM computers and advances in computer software and other related programmes. By the 1980s, the British Government started funding it once more to compete with efforts the Japanese are making towards the technology. Another AI winter was experienced from 1987 to 1993 which coincided with the collapse of the market for some of the early general-purpose computers and reduction in governments' funding. Academic research in AI came into lime light when IBM's Deep Blue became the first computer to beat a chess champion when it defeated Russian grand master, Gary Kasparov. In 2011, the computer giant's question-answering system, Watson won the Quiz Show, "Jeopardy" by eliminating the reigning champions at the time. Also in 2014, the talking computer, "chatbot", Eugene Goostman captured headlines for winning the Turing Test, a competition developed by a British mathematician and computer scientist, Alan Turingin 1950, as a way to assess whether a machine is intelligent or not (Lewis, 2014, https://towardsdatascience.com, retrieved on 06/04/3029)

In the field of journalism, or journalistic practice, *artificial intelligence* has begun to play a major role, especially in developed economies. Through AI, software stories are produced automatically by computers rather than human reporters. These programmes interpret, organize and present data in human readable forms. Artificial intelligence is formulaic in nature and applies to stories which are based on statistics and numerical figures. It has innovated and changed how media work is carried out by leaner staff. Robots are trained through development of algorithms which they interpret and write faster than humans, and produce scores of news stories simultaneously within few seconds. They fast track journalists' reporting, since robots can import data from various sources, recognize trends and patterns, and the use of Natural Language Processing put them into context and help to construct sophisticated sentences.

Machines can be programmed to learn variations in patterns over time and help reporters arrange, sort and produce contents at a great speed. They can systematize data, identify trends and spot a difference which could lead to a scoop, or analyze data to support investigations or fact check stories. These automated machines are fed data based on structured templates to reproduce same as contents which are produced either for print or broadcast media organizations. In automated journalism which is also known as robot journalism, news articles are generated by computer programmes. Further, automated news writing and distribution take place without human supervision.

Objectives of the Study

The main objective of this chapter is to provide an overview of how AI will influence journalistic practice in Nigeria. Others include the following:

i.   To determine if AI has been applied to journalistic practice at any time in Nigeria.
ii. To examine factors that will ensure successful application of AI to journalism practice in the Country.
iii. To provide insights into challenges that may likely hinder successful application of AI to journalism practice in Nigeria.

Methodology

Essentially this is a conceptual work, which intends to provide an overview of how AI can be successfully applied to news rooms, either in broadcast or print, of Nigeria. To achieve this, we are adopting a qualitative approach whereby we shall interrogate concepts and issues

related to AI, through the study and analysis of data derived from secondary data got from books, meta-analysis of related studies done on the field, interviews, personal observations and online materials. It is our objective to make calculated propositions from the work that will provide a fulcrum for other scholars and students interested in this emerging field to work from. Our attempt which is purely academic shall be objective, is further aimed to enrich scholarship in the implication of AI to journalism practice in Nigeria and other sub-Saharan nations.

Conceptual clarifications

Several concepts were used in this chapter which needs to be clarified given their significance to the study. A better understanding of these will further ensure clarity and insights of the perspective of the writers in their contributions. Among these concepts include:

Journalistic practice: Journalism deals with the gathering, writing or announcing, compiling, editing and distribution of news, stories of different kinds and formats, information to satisfy the information needs of different audience types, using different media types or genres. According to Hasan (2014), "the concept of journalism practice as an act of communication which based on asking the questions such as Who? What? How? Where? When? Why?". He further emphasized that journalism is "anything that contributes in gathering, selection, processing of news and current affairs for the press, radio, television, film, cable and internet". Further, it deals with collecting, analyzing, verifying or confirming, and presentation of news of current events, trends, issues and people. Practitioners of journalism are journalists. Citing McQuail, Hasan (2014) defined journalism as, paid writing for public media with reference to actual and ongoing events of public relevance. Related to this, Shukla (2000) defines mass media as social institutions responsible for serving the society by compiling, writing and distributing the news of the day". As to the practice of journalism, especially, as it obtains in Nigeria, Njoku and Njoku (2011) observe that the mass media in Nigeria have inadvertently positioned itself for a new dawn. "The use of state-of-the-art printers, transmitters, digitalization and computerization of the print and broadcast media …all bear eloquent testimony to the new dawn. Broadcasting has moved from its use of analogue and outdated equipment to the use of modernized and technology friendly equipment that the Information Superhighway demands" (p. 12).The implication is that

journalistic practice is ongoing and thriving in Nigeria. It has further been enhanced through addition of digital equipment to enhance production and reception of messages from the different media types.

Artificial Intelligence

As it has been noted earlier, man has always thought of how non-living objects can come to life, and this notion became reality with research and developments in robotics by institutions, funding nations and countries in the West. It was at a conference in New Hampshire in 1956 that John McCarthy coined the term *artificial intelligence*, to describe the emergent technology at the time. With growth and progress made in studies done in the area, AI has become applied to various sectors including financial, manufacturing, pharmaceuticals, engineering, medicine and other industries. Lately, media and journalism have adapted AI to carry out journalistic functions and tasks.

Introduction of this technology is significant as it has impacted on earnings and profitability of businesses. According to Sarbjit Nahal, the Managing Director of Bank of America, Merrill Lynch, artificial intelligence is set to be the largest driver of technology over the next decade, and in the process of this growth, many creative industries will be automated to some extent by AI, because their value chains work the same way. They each start with content creation or collection, move to processing and editing, and end with the distribution of such content. Immediately artificial intelligence gets the mechanics of one creative process, it can quickly be applied to another. By implication, the adoption of AI creates room for its spread within a sector, or related ones. Relating this to journalism, Crespo (2018) observed that instant news production can be seen as a continuation of the automation that started in the late 1980s which is gradually becoming the bedrock of data driven journalism. There is reliance on machines to breakdown data so as to seek patterns, and report same, using different media types. The implication of this is that data journalism practise is a growing field which currently assist empowers journalists through the application of *artificial intelligence* tools. These provide journalists with deep insights into breaking news, using data analysis which is achieved through machine learning that makes such analysis easier and accessible. Elaborating on this, *Washington Post* reported that robot reporters published 850 stories in a year, while in China, *Xinhua*, the state-run news agency debuted the World's first AI news anchor. Similarly, Reuters through its News Tracer system had broken over 50 major news stories. Vogt, a former head of innovation at Norwegian

News Agency, NTB, observed that automation has helped NTB deliver a much broader news service, reporting on lower tier matches that they never had the capacity to cover before. Continuing, David Caswell, a Fellow of Reynolds Journalism Institute of the University of Missouri reports that, "artificial intelligence offer big benefit which increase the scale, personalization and customization through speed and accuracy in reporting news beats". Some other advantages include the fact that algorithms help journalists make rough cuts of videos, recognize voice patterns, identify faces in a crowd and programmed to chat with readers (chatbots) and answer queries.

Automation in journalism has began to be applied in some countries, and in Africa, experimental practices in application of artificial intelligence has taken place in Namibia and South Africa. However, it is yet to become commonly used and entrenched in different sectors across industries in most African countries. As much as AI technology has had positive advantages in different industries, it has not been commonly deployed across Africa, and indeed in Nigeria,it is less so as a result of the exorbitance of its cost of production and maintenance. And again, media houses may not have the capacity to effectively add to the newsroom. Automated journalism or application of AI into journalistic practices has had positive results, and it can be adapted to suit needs of different genres of journalism.

Theoretical foundation

Further to the examination of these concepts which are central to the work, we shall examine theories which further stand as underpinnings for it. The theoretical foundations for the work are **Media richness** and **Technological determinism theories**.

Media richness theory: This theory is also known as information richness theory in 1981, according to Asemah, Nwammuo and Nkwam-Uwaoma (2017). It posits that media richness occurs when a communication medium can reproduce the information sent over to it. The theory was developed by Richard L. Daft and Robert H. Lengel in 1984, and it is used to rank and evaluate the richness of certain communication media, such as phone calls, video conferencing and email (Asemah, *et al*, 2017: 270). This theory holds that computers enhance communication in organization, but it has further expanded to include roles that computers play to ensure clarity, fidelity and richness of media used to communicate. It was further argued that the richer the medium used to transmit a message, the clearer and less

ambiguous the delivery. According to Asemah, *et al* (2017), "as technology has advanced, this theory is constantly being reviewed and retooled to fit in our modern, technology rich world we find ourselves in" (p. 270). Importance of this theory to this paper cannot be overemphasized. Robotics and its uses have become universal, and are applied to journalism. And one of its objectives is to ensure speed, accuracy and fidelity in production of news and their distribution, as a result, the notion guiding the theory are manifest in the use of AI in journalistic practices.

Utilization of artificial intelligence has further enriched information and communication received and disseminated by the media. Application of AI to media production increases acceptability and access of greater number of people to news, and at faster rates. As Asemah, *et al*, (2017) observed, "richer electronic media usually permit more types of information and feedback, enabling more comprehensive transmission and reception of messages and a better adaption of the message to the particular recipient". Relating this description to the use of AI in journalism is fitting taking into cognizance that through it (AI) there is an assurance of fidelity in news writing, reproduction and delivery in such a way that the audience member will receive the information with clarity, accuracy and understanding.

Technological determinism theory is premised on the term 'technological determinism' which was coined by Thorstein Veblen (1857 – 1929), an American sociologist and economist. However, it was Karl Marx who said that visible changes in productive technology have basic influence on human social relations and organizational structure, Karl Marx in Asemah, *et al* (2017) believed that "technological progress leads to newer ways of production in a society and this ultimately influences the cultural, political and economic aspects of a society, thereby inevitably changing society itself". This theory complements this work, as it deals with implications of robotic technology to growth and development of different sectors in societies. Technology is perceived as the plank upon which societies, including their cultures evolve. Technologies create newer ways of production, and impact the political, cultural and economic aspects of society.

Marshall McLuhan in 1964 expanded the scope of technological determinism theory and focused on the effects and/or impacts ICTs have on users, organizations and society at large. The theory further states that media technology shapes how we as individuals in a society think, act and how society operates as it moves from one technological age to another. As Asemah, *et al* (2017) observe, "as technology is stabilized, its design tends to dictate

users' behaviours, consequently diminishing human agency" (p. 298). Citing Chandler (2000), Asemah, *et al* further observe that technology such as writing or print or television or the computer changes society to reflect the content and expositions of the technological trends. In its most extreme form, the entire form of society is seen as being determined by technology; new technologies transform society at every level. Adoption of AI in the news room has changed profoundly how it is carried out, including the speed with which news activities are done. Also, though fears of human journalists may seem real, given that robots are programmed to do their jobs, however it provides room for them pay attention to those activities which automatons cannot do. However, its growing popularity and adoption will impact how media shall work, change orientation of journalists, and reception of news by target consumers.

Types of Artificial Intelligence

AI is used in various ways and in different sectors of any economy in any society. In advanced countries, AI is adopted in most sectors including industries, manufacturing, education, banking, medicine, governments, oil servicing, shipping, creative organizations, journalism and in every imaginable way. It is used in project design and modeling. In organizations, decisions are reached as a result of solutions provided by AI or *expert systems* installed for such purposes.

According to Hintze (2016), sentient and intelligent machines are just on the horizon. But according to a White House report, it does not see machines exhibit broadly applicable intelligence comparable to, or exceeding that of humans. But the report stated that machines will reach and exceed human performance on more and more tasks. Continuing, Hintze noted that there mainstream AI tools, categorized as machine learning and deep learning. These technologies play 'Jeopardy' well, and beat human Go masters at the most complicated games ever invented. And they are able to handle huge amounts of data and make complex calculations very quickly.

However, there are four basic types of AI which have been recognized by experts, and these are: **Reactive Machines**, **Limited Memory**, **Theory of Mind** and **Self Awareness**.

Reactive Machines

Reactive machines are the most basic artificial intelligence basic system which is naturally reactive and don not have the ability to form its own memories or use its past experience to form current decisions. An example of this is Deep Blue, IBM's chess playing supercomputer that beat international grandmaster, Gary Kasparov in the late 1990s, is the perfect example of this type of machine. In this type of intelligence, the computer processes the world directly. It has no internal they concept of the world directly. Intelligent machines presently do not have any concept of the world, nor do they have limited or specialized ones for particular duties. Innovations in Deep Blue's design were not done to broaden the range of knowledge of things, but it was designed to narrow its view, to stop pursuing some potential future moves, based on how it rated their previous outcome.

Limited Memory Machines

This type of machines contains what the inventors describe as look into the past. It largely retain data for a short period of time. They can use data for a specific period of time, but they cannot add it to a library of their experiences. Many autonomous cars use limited memory technology to operate by using adaptable memory to observe other cars speed and direction. Such observations are added to the autonomous cars pre-programmed representations of the world, which also include lane marking, traffic lights and other important elements like curves in the road. According to Ray (2018), "they save data, such as the recent speed of nearby cars, the speed limit, and other information that can help them navigate roads effectively with minimal or no casualty."

Such information about the past is transient. They are not saved as a part of the car's library of experience from which it can learn from like human drivers do, when they store experiences gathered over the years behind the wheels.

Theory of Mind Machines

This could be considered as an important divide between the machines we have and the machines we intend to build in future. Humans do have thoughts, emotions, memories and mental models that drive their behaviour. In psychology this is called, theory of the mind. And this is why researchers of artificial intelligence call such machines by the name of the theory. Theory of the Mind researchers hopes to build computers which imitate our mental models by forming representations about the world and about other agents and entities in it.

One goal of these researchers is to build computers that relate to humans and perceive human intelligence and how individual emotions are impacted by events and the surrounding.

As humans form societies as a result of their emotional and psychological attributes, they achieve social interactions and relate one with another. It is assumed that if AI systems are to become more human, they will need to adjust their behaviour to suit their knowledge of thoughts, feelings and expectations which are seen in humans.

Self-Awareness Machines

Conception of self-awareness machines are of those types of robots used in science fiction movies. It is the final step in AI development when systems can form representations by themselves. At this point, machines would have a consciousness and understanding of themselves, and of their environment. According to Ray (2018), "AI enthusiasts believe them to be the ultimate goal of AI development." It is in a sense, an extension of the Theory of Mind machine possessed by Type 111 artificial intelligence. Consciousness is called self-awareness for the reason that like humans, conscious beings are aware of whom they are, know their internal states, and are able to predict feelings of others. However, without a theory of the mind awareness, we cannot make such an inference.

Though a machine can operate as a person by preserving itself, predict its needs and demands while relating to others as an equal, it cannot truly be self aware, or 'conscious'. To achieve such a state, Hintze (2016) observes that it is pertinent that AI researchers to beam their research light on understanding memory, learning and the ability to base decisions on past experience. He further observes that this is crucial when AI researchers want to design or evolve machines that are more than exceptional at classifying what they see in front of them. To Ray however, the question of whether a machine can become truly self-aware, or 'conscious' is best left for philosophers. By implication therefore, while concepts of self-aware machines which can behave like humans, relate on past experiences and predict the future have been thought of, it is yet within the realm of fantasy or Sci-Fi movies which attribute human elements to machines and may not be achieved in the foreseeable future.

Need for Artificial Intelligence in Nigeria

The first to use the term artificial intelligence (AI) to denote machines that could think autonomously was John McCarthy (Darell, 2018). He further explains AI as getting a computer to do things which when done by people, are said to involve intelligence. Artificial Intelligence(AI) according to Techopodia asserts that it is an aspect of computer science that lay emphasis on creating intelligent machine that work, act and react like human (https://www.techopedia.com>definition).

On its own part SAS explains that AI makes it possible for machines to learn from experiences, adjust to new inputs and perform human like tasks (https://www.sas.com >insights>analytics). Furthermore Kraay, (2018) posits that AI will define the next generation of software solutions. He highlighted the definitions of AI such as the ability of a digital computer or computer – controlled robot to perform tasks commonly associated with intelligent beings. Artificial Intelligence (AI) refers to software technologies that make a robot or computer act and think like a human (https://marketbusinessnews.com>artificialintelligence).

There is great need for AI in developing countries, Nigeria inclusive. This is because of the anticipated industrial or digital revolution. Without AI, many scholars posit that it will be difficult to cope. Also, some scholars opine that AI can be used to improve many areas of life such as agriculture, security, healthcare, entertainment, education, business sectors, aviation, finance, transportation among others.

The term artificial intelligence sounds highly technical to many but this is what we use on daily basis. Examples of Artificial Intelligence (AI) in everyday life show that we are already using it on daily basis both online and offline (The Manifest, Sept 26, 2018). Some of the areas where AI are used include e-mail operations, smart replies in g-mail, nudging reminders in g-mail, media operations, chat bots, Facebook proactive detection, web searchers, Google predictive searchers, algorithm, product and music recommendations. Other areas include; smart phones, video games, security and surveillance, mobile banking, financial institutions, commercial airline flights and Uber applications (The Manifest, Sept 26 2018).

Both developed and developing countries have seen the need for the application of (AI). That is why many organizations particularly in developed countries today deploy (AI) for higher productivity. However, Alajemba and James, (2018) posit that though Nigeria as a country has seen the need for deployment of (AI) but it is still not part of technological life in Nigeria. Buttressing the need for artificial intelligence, Mamudu and Mustaph (2017).

Nsude (2019) opines that robots are actually creating new, high paying jobs that require skill acquisition and replacing low skill workers. The scholars cited examples in manufacturing where robots perform mental tasks such as raw material sorting, transporting and stocking while humans focus on higher skilled work. The International Federation of Robotics (IFR, 2017) buttresses the fact that robot increases productivity and competitiveness thereby leading to increased demand and creation of new job opportunities.

Jim (nd) summarizes the importance of artificial intelligence in the following ways:

(i).   AI automates repetitive learning and discovery through data and also performs frequent high-volume computerized tasks reliably and without fatigue. However human inquiry is still essential to set up the system and ask the right questions.

(ii).   AI adds intelligence to existing products. In most cases, AI will not be sold as an individual application. Rather, products already in use will be improved with AI capabilities. For instance, Siri was added as a feature to a new generation of Apple products.

(iii). AI adopts through progressive learning algorithms to let the data do the programming. The algorithm becomes a classifier or a predictor so the algorithm can teach itself what product to recommend next online.

(4).   AI analyzes more and deeper data using neural networks that have many hidden layers. A few years ago, it was impossible to build a fraud detection system but it is possible today with incredible computer power and big data. The more the data, the more accurate they become.

(5).   AI achieves incredible accuracy through deep neural network, which was previously impossible. Today AI technique from deep learning, image classification and object recognition can now be used to find cancer on MRLs with the same accuracy as highly trained radiologists.

(6).   AI gets the most out of data. When algorithms are self-learning, the data itself can become intellectual property. The answers are in the data; you just have to apply AI to get them out. If one has the best data in a competitive industry, even if everyone is applying similar techniques, the best data will win.

However, it is pertinent to note that there are certain tasks that artificial intelligence cannot perform, so there is great need for human – AI partnership.

Application of AI to Journalistic Practices in Nigeria

Journalistic practices is not a set of rules but a guide that encourages all who engage in journalism to take responsibility for information they provide regardless of medium (Society of Professional Journalists, 2014 https://www.spj.org>ethicscode).

The work of journalism is creative, it's about curiosity, it's about storytelling, it's about digging and holding government accountable, its critical thinking, its judgment and that is where we want our journalists spending their energy Gibbs (nd).With the deployment of AI, stories are produced automatically by computer instead of human reporters.

In line with numerous benefits of AI, (Kent, 2015) observe that many news organizations today have made it a routine to use artificial intelligence to write news. Some of the news organizations include: –

The Associated Press in the US, leader in using robot news writing generates sports and business stories that appear in thousands of publications (Kent, 2019). Also, a system called Heliograf writes stories for the Washington Post and the Swedish local news publisher M. Amedia produces robot – written stories (Kent, 2019).

Marr (2017) explains that the local news industries in the UK and globally have been in a state of decline for the past decade. The reason according to him is that readers have switched to internet and social media for news and advertisers spend their money elsewhere. This development led local news journalists to lose their jobs and worst still local news not given attention.

It was at this point that leading UK news agency – Press Association (PA) posits that AI can fill the gap left by redundant reporters and shuttered local newspaper offices. The outcome was the creation of 30,000 localized news reports every month (Marr, 2017).

The technology relied on the Natural Language Generation (NLG) which has been instrumental to the progress that has been made in recent years. The secret behind the success is that it is faster to teach infallible machines to understand and communicate in our human language than teaching slow, fallible humans to communicate with computers in their language, a typical example is learning computer code. Marr(2017) explains further, that this is the technology behind iphones Siri and Amazon's Alexa as well as 'chatbots' which are increasingly taking on customer service role instead of answering questions, their job is to write news stories based on the data it is fed.

Artificial Intelligence and Human Interaction in Journalistic Practices

There is great need for AI and humans to work harmoniously in the interest of the entire society. Stressing the need for humans and machines to work together, Marconi, (2016) says that "AI might aid in the reporting process but journalists will always need to put the pieces together and construct a digestible, creative narrative." He further posits that "AI cannot fulfil its apparent promise without the diligent management and care of the journalists learning how to put these new technologies into practice".
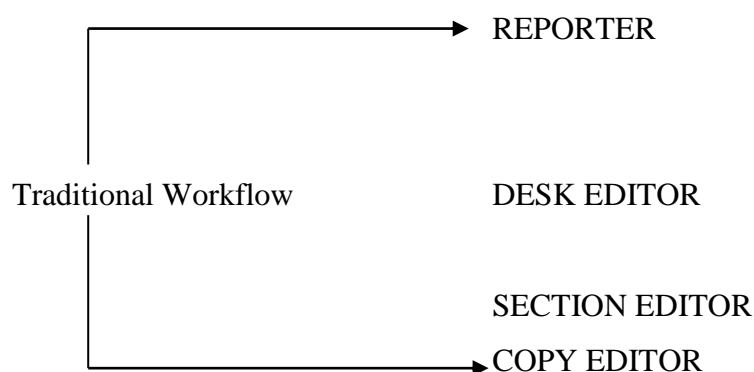
Highlighting the benefits of AI in journalism, Marconi, (2016) posits that the challenges within today's media which the traditional news methodology has not yet resolved is that the news market has been oversupplied and the implication is that journalists should do more and better. Buttressing his point, he opines that "News organisations need more volume to support the growing demand for information, but journalists also need to build differentiation into their content, thereby distinguishing their reporting from growing competition. AI can accomplish both of these goals.

By integrating Automated Insights' platform, AP were able to automate their quarterly earnings reports generating more than 3,000 stories per quarter compared to just 300 previously, and errors were greatly reduced. Also Frances Marconi, (2016) a strategy manager who has over seen the introduction of AI technologies since the beginning said that far from making journalists obsolete, the kinds of automation promised by AI could free them up to focus on the aspects of journalism which matter most. Marconi, (2016) calls it a 'new era' of augment journalism which he insists still makes the work of journalists more accurate and effective than before.
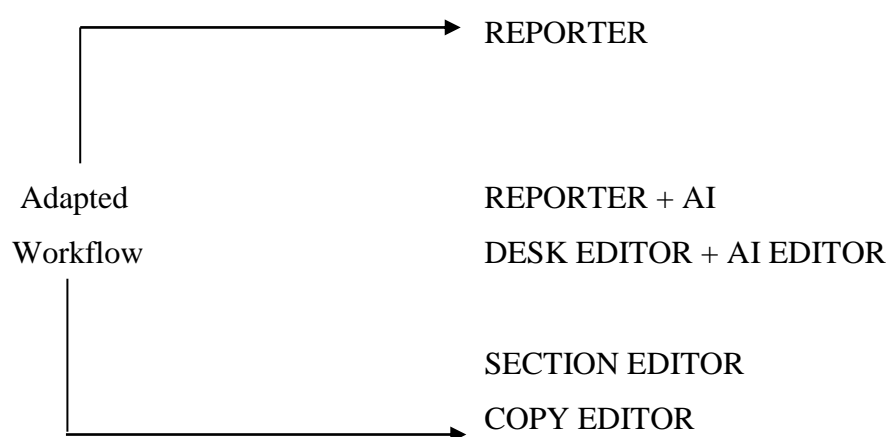
Changing structure of the News Room

Marconi, (2016) argues that implementing any new system will disrupt the existing workflow of the newsroom. He further posits that AI could completely transform the newsroom and the work of journalist demanding new technical skills among journalist and the need for new better work flows. The changes will be gradual and should be kept in mind particularly now that we are anticipating digital revolution. Marconi, (2016) says that News room roles like 'Automation Editor and 'Computational Journalist are emerging alongside an increased interest in digital and data journalism courses. This implies that in no distant future it will not be enough for journalists to simply conduct profile interviews and complete 750 – words write ups.

Diagram:

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                        ┌─────────────────────►  REPORTER
                        │
                        │
Traditional Workflow    │              DESK EDITOR
                        │
                        │              SECTION EDITOR
                        └─────────────►  COPY EDITOR
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The New Structure

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                        ┌─────────────────────►  REPORTER
                        │
                        │
 Adapted                │              REPORTER + AI
 Workflow               │              DESK EDITOR + AI EDITOR
                        │
                        │              SECTION EDITOR
                        └─────────────►  COPY EDITOR
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Source: Marconi, (2016).

In the report entitled 'The Future of Augmented Journalism, Associated Press identified a number of technologies with clear applications within the newsroom. They include: unsupervised and supervised machine learning, natural language generation and processing, speech recognition, speech to text, and machine vision. All these augment the work of journalists. The report points out that AP are using AI to increase their data analysis, identify patterns, trends and actionable insights from multiple sources see things that naked eye cannot see; text into audio and video; understand sentiment; analyze scenes for objects, faces text or colours and more. This report reveals that there are greater speed, accuracy, scale and diversity of coverage.

Challenges of Artificial Intelligence in Journalism

Three important areas that AI is changing the practice of journalism include automating routing reporting, providing faster insight and lowering barriers to entry (www.weforum.org).

(i).   **Automating routing reporting:** This is the use of AI to rapidly expand coverage. AI in this context can save the time of journalists in news coverage particularly in the area of conducting interviews with real people.

(ii).   **Providing faster insight:** AI can automatically react to real time data with the outlines of a story. Without the deployment of AI quarterly reports of an organization which takes a very long time can be done under a few minutes by artificial intelligence.

(iii). **Lowering barriers to entry:** AI can reduce the human element in the content creation process. AI allows journalists to create short videos from text in seconds or collect information from on – the – ground sources.

Despite the numerous benefits of AI in journalism, it is pertinent to X-ray the challenges which should be addressed in the interest of both journalism profession and the society at large.

Hall (n.d) summarizes the challenges of AI in journalism in seven concrete ways

Technical challenges

(i).   **Availability of data:** Machine learning is facilitated by sufficient data to enable it pick on patterns, learn from them and optimize the system accordingly. All requires large amounts of data to know what the correct response ought to be. Without the availability of data, the ability of AI is limited.

(ii).   **Understanding unstructured data:** It is difficult for AI to work with unstructured data. Tabulated results of sports games or earning data for instance can be easily translated into articles by using standardized templates, but if AI is to become more wide spread in the creative economy, it will definitely need to harness and synthesize unstructured data, which make up most of the data available today.

(iii). **Lack of self awareness:** AI does not have the ability to explain its output. For instance why it wrote what it did and how it got there.

(iv).   **Verifying authenticity:** AI cannot distinguish whether the input it receives is accurate or not. If it receives false input, the output will equally be influenced negatively.

Governance challenges

(v). **Redefining copyright and fair use:** New technologies have frequently challenged copyright laws in the creative industries. Machine learning potentially posses a new conflict, because it involves AI learning from human – created expressive works for example, a data set of articles, paintings, or music that tend to have rights owners and generating its own output. This questions the legal interpretation of 'fair use', where copyrighted material is used to produce new and 'transformative' content without permissive or payment of royalties.

(vi). **Ensuring corporate accountability:** Since AI cannot be held legally accountable so human accountability should be entrenched in all stages of the content value chain.

(vii). **Exacerbating asymmetrical power:** The new trend in the contemporary society is that the biggest newsrooms are building their own AI but smaller outlets may not be able to build theirs because of high cost and technical expertise. The implication is that they would be forced to license proprietary content.

Other challenges of deployment of AI in developing countries such as Nigeria include:

(i). Lack of political will and interest by our leaders

(ii). Epileptic power supply

(iii). Lack of training for the journalists

(iv). Lack of AI knowledge

(v). Ignorance on the part of many because AI is still looked at as being highly technical and is the business of technical people. Others look at it as 'white man's witchcraft'.

Despite the challenges of the deployment of AI in journalism, the benefits outweigh their losses. Buttressing this assertion, Sanya (2018) posits that Artificial Intelligence should be maximized to improve both broadcasting and journalism and not necessarily render people jobless.

Conclusion

This chapter concludes that deployment of AI to journalism has numerous benefits that would take journalistic practices to a greater height in Nigeria. However, some challenges were analyzed and should be addressed for successful deployment of AI to journalistic practices in Nigeria. Such challenges include – automating routine reporting, providing faster insight, lowering barriers to entry, availability of data, understanding unstructured data, lack of self awareness. Others are verifying authenticity, redefining copy right, ensuring corporate accountability, exacerbating asymmetrical power, lack of political will and interest, epileptic

power supply, lack of training for journalists, lack of AI knowledge and ignorance. Nigeria as a country is still at a teething stage in the area of AI generally, so there is need to act urgently in anticipation of digital revolution.

Way forward

Based on the conclusion, the following recommendations are postulated:

i.   The technical challenges such as availability of data and understanding unstructured data should be adequately addressed because without data AI cannot function.

ii. There is need to develop and implement mechanisms to ensure the authenticity of articles that are shared online. These could include metadata and trackbacks for fact and sources.

iii. The government should show interest in the need for deployment of AI in Nigeria. This interest should be demonstrated by establishing an agency for AI in Nigeria. Also such interest should be further demonstrated by providing regular power supply in Nigeria.

iv. Journalists should create awareness on the benefits of AI in journalism. Such awareness might capture the interest of the government and make them invest on AI in different areas. Also, the general public will be enlightened to know that AI is for everybody and not only the technical people. Furthermore, they should also know that AI is not the white man's witchcraft but emerging technology that will benefit all.

v.   Journalists and the general public should be trained in order to acquire knowledge of AI. This implies experts organizing conferences, symposia, discussions, seminars among others.

vi. There should be proper understanding of the importance of human – machine partnership by journalists in deploying AI to journalism.

References

Alkhalisi, Z. (March 5, 2019), 'Abu Dhabi Startup is using AI to transform how kids learn', cnn.com, retrieved 09/04/2019

Asemah, E. S, Nwammuo, A. N & Nkwam-Uwaoma, A. O. A (2017), Theories and Models of Communication, Jos: MATKOL Press

Bradley, R. (2018). Artificial Intelligence in your everyday life. The Manifest of Sept. 26, 2018 https://medium.com/othe-manifest/16-examples-of-artificial-intelligence-ai-in-your-everyday-life-655b2eba49de

Crespo, M. (November 27, 2018), How artificial intelligence is transforming journalism, (n.d)

Dossett, J. (November2018), 'A Look Ahead: Where Artificial Intelligence may take Journalism in 2019,' https://mediablog.prnewswire.com, retrieved on 29/01/2019

Gibbs, L. (nd). News Partnership https://www.journalismfestival.com/speaker/lisa-gibbs

Goodnight, G. (nd). Learn more about SAS for Artificial Intelligence – www.SAS.com/en-us/insight

Hall, S. (2018). Seven challenges for AI in journalism. (https://www.weforum.org>2018/10>ca

Hasan, S. (2014), Mass Communication: Principles and Concepts, New Delhi: CBS Publishers
And Distributors Pvt. Ltd

Hintze, A. (November 14, 2016), 'Understanding the Four Types of Artificial Intelligence,' https://wwwgovtech.com, retrieved on 16/04/2019

Huang, K. And Yu, Y. (2019). The Extension or control of Human' A case study based on China Xinhua Zhiyun's 'Media Brain'. A presentation at Colloquium (OMTECDEV) in Bordeaux, France. From 14th – 15th, 2019.

Kent, T. (2019). An Ethical Checklist for Robot Journalism (https://medium.com/@tjrkent/an-ethicalchecklist-for-robot-journalism-IF4dcbd7be2.

Kraay, V. T. (2018). Artificial Intelligence to Identify the next generation of software solution. (https://azure.microsoft.com.en-us/blog/author/thvankra/?cdn=disable.

Lewis, T. (December 4 2014), 'History of AI – Towards Data Science,' https://towardsdatascience.com, retrieved on 06/04/2019

Marconi, F. (2016). What artificial intelligence can do for journalists and newsroom (https://www.linkedin.com>francescompm.

Njoku, N. L & Njoku, G. O. (2011), History of the Nigerian Mass Media, ed., Nworgu, K. O. Understanding Mass Communication: Concepts and Applications (3 – 13), Owerri: Ultimate Books

Ray, S. (August 11, 2018), Four Types of AI, https://codeburst.io>four-types-of-ai-bc, retrieved
     on 16/04/2019

Ronderos, M. T. (n.d), Artificial Intelligence demands genuine journalism, https:blog.wan-ifra.org, retrieved on 29/01/2019

Sanya, R. (2018). Artificial Intelligence to Improve Broadcasting and Journalism (https://www.channelstr.com/2018/02/27/artificial-intelligencewill-improve-broadcasting-not-create-unemployment-sanya/

Shukla, A. K. (2000), Mass Communication and Journalism, New Delhi: ANMOL PUBLICATIONS PVT. LTD

Smith, C, McGuire, B, Huang, T & Yang, G. (2006), 'The History of Artificial Intelligence,' University of Washington, https://courses.cs.washington.edu> retrieved on 06/04/2019

Society of Professional Journalists (2014) https://www.spj.org>ethicscode

Stefan, H. (January 15, 2018), 'Can you tell if this was written by a robot? 7 Challenges For AI in Journalism', World Economic Forum, https://www.weforum.org, retrieved on 29/01/2019

West, D. M. (2018). A Blueprint for the Future of AI (Https://www.brookings.Edu/series/a/blueprint-for-the-future-of-ai/page/2/

www.weforum.org

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