

UTILIZATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN CONTEMPORARY NIGERIAN SOCIETY: PROSPECTS AND CHALLENGES

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Abstract

The ability of a digital computer, computer-controlled machine, or robot to carry out activities often performed by intelligent entities like humans is known as artificial intelligence (AI). The research being examined focuses on the significance, challenges, and practical applications of artificial intelligence in Nigeria. The historical significance of artificial intelligence in relation to Nigeria was covered in the research. The challenges facing artificial intelligence in Nigeria were specifically discussed, and some instances showing its potential that could improve the country's economy were also provided. In conclusion, the paper explored the potential of artificial intelligence in the technology sector generally and in Nigeria specifically. Some suggestions were made to promote the advancement of artificial intelligence in Nigeria based on the significance, challenges, and practical applications of artificial intelligence in the country. The article suggests that creative research and policy-making are required on the application of artificial

intelligence (AI) in workplace management, hiring of personnel, and monitoring.

Keywords: Artificial Intelligence, Challenges, Applications, Prospect, Technology

Introduction

Since all human behavior has been attributed to intelligence, intelligence has been regarded as one of the most significant human attributes. Humans are the most intelligent of all the animals that have been produced, claims Kumar (2018). Their ability to exert superior behavior on other animals by putting them under desired control is evidence of this. Human intelligence is demonstrated by the way that human behavior interacts with the natural world and the environment, leading to the natural selection of random mutations that increase intelligence. Mutations that allowed our ancestors to influence others' perceptions of the natural and human world are thought to have contributed to the evolution of sophisticated abstract thought in humans. There are several ways to describe intelligence, such as the ability to reason, comprehend, be self-aware, learn, have emotional knowledge, plan, be creative, and solve problems. More broadly, it may be defined as the capacity to take in or deduce information and retain it as knowledge that can be used to implement adaptive behaviors in a given setting.

The ability to retain, recall, and apply information is the definition of intelligence, which can be used to suggest that human intelligence is related to the ability of humans to do so. Intelligence gives humans the cognitive skills necessary to learn, form concepts, comprehend, apply logic, and reason, including the ability to recognize patterns, comprehend ideas, plan, solve problems, make decisions, retain information, and communicate through language. Given its correlation with several pertinent variables, such as the likelihood of an accident, obtaining better pay, etc., intelligence is one of the most valuable ideas in psychology. In general, psychologists see human intelligence as a collection of several different skills rather than a single characteristic. Most frequently, intelligence is examined in humans, although it has also been observed in non-human animals, plants, and, more recently, technology. Artificial intelligence (AI) is the term used to describe the study of machine intelligence. AI is frequently applied in computer systems via the use of programs and suitable electrical circuits (Smith, 2006). The idea that human intellect may be so accurately characterized that a machine can be created to mimic it is the foundation of artificial intelligence (AI). This brings up philosophical questions concerning the nature of the mind and the morality of creating artificial beings with human-like intelligence. These are topics that have been studied throughout history by myth, fiction, and philosophy (McCorduck, 2004). Artificial

Intelligence (AI) is also viewed by some as a threat to mankind if it develops unchecked. In contrast to other technological revolutions, some people think that artificial intelligence (AI) may increase the possibility of widespread unemployment. This suggests that the development of machines with human-like cognitive processes and traits- like reasoning, meaning-finding, generalization, and experience-based learning- misses something that artificial intelligence is working on.

Artificial intelligence (AI) research primarily focuses on the following aspects of intelligence: language usage, learning, reasoning, problem solving, perception, and planning. The concepts of Artificial Neural Networks (ANN), which mimic neurons or brain cells, frequently enable deep learning of Artificial Intelligence (AI). The inspiration for artificial neural networks came from biological phenomena. The neural net models enable more general learning by simulating the functions of the human brain using mathematical and computer science concepts. In an artificial neural network, neurons, or nodes, are constructed from code rather than biology in an attempt to mimic the functions of intricately linked brain cells. Three layers make up neural networks: an input layer, a hidden layer, and an output layer. Thousands or even millions of nodes can be found in these levels. For the input layer, information is supplied. A certain weight is assigned to inputs, and as they go through the network, linked nodes double

the connection's weight. According to Smith (2006), the information unit can basically go on to the next layer if it achieves a specific threshold. In order to learn from experience, machines compare neural network outputs and adjust thresholds, weights, and connections according to the differences between them.

The Concept of Artificial intelligence (AI)

According to McCorduck (2004), artificial intelligence (AI), often known as machine intelligence, is the intelligence exhibited by machines as opposed to the natural intelligence exhibited by humans and other animals. This suggests that actions often performed by sentient entities like humans and animals may be programmed into robots. With the aid of digital electronics, this branch of computer science focuses on building intelligent machines that behave and act like people. The endeavor of creating systems with human-like cognitive processes and traits- like reasoning, meaning-finding, generalization, and experience-based learning- is commonly referred to by this phrase. Since the 1940s, when the digital computer was first developed, it has been shown that computers can be programmed to perform extremely complicated jobs, such as finding proofs for mathematical theorems and playing chess very well. For decades, researchers have been studying artificial intelligence (AI), which remains one of the most difficult topics in digital computing.

In spite of this, it is sweeping the globe due to its creative applications in every sector of the economy. In fact, it will be decades before artificially intelligent robots supersede all human intelligence. Artificial intelligence (AI) encompasses anything from computers that can really think to search algorithms that are used to address social issues. Actually, as a new technology in the surgical industry, intelligent robots are becoming more and more in demand. According to McGuire (2006), deep learning and natural language processing are key components of the majority of artificial intelligence (AI) examples that are now in the news, ranging from self-driving automobiles to computers that can play chess. Through the use of these technologies, computers may be trained to process vast volumes of data and identify patterns in order to do certain jobs. Developing technology that enables intelligent operation of computers and other things is the overarching research objective of artificial intelligence. There are several sub- problems within the larger issue of imitating (or producing) intelligence. These include certain characteristics or skills that scientists anticipate an intelligent system to have. Learning, thinking, problem-solving, perception, planning, and speech recognition are among the characteristics. It has been stated that these characteristics have drawn the greatest interest in artificial intelligence (AI) technology.

The Origin of Artificial Intelligence (AI)

The idea that an inanimate object can acquire intelligence is known as artificial intelligence, and it has been around for a while. All of it began in antiquity with stories, myths, and rumors of talented craftspeople building sentient or intelligent artificial entities. In fact, the ancient Greeks had myths about automatons, and Chinese and Egyptian engineers had built them. Today's artificial intelligence (AI) has its roots in the classical thinkers' attempts to describe the human mind as a symbolic system. However, the subject of artificial intelligence was not fully established until 1956, when John McCarthy coined the phrase during a conference at Dartmouth College in Hanover, New Hampshire (McGuire, 2006). The conference's attendees, notably MIT cognitive scientist Marvin Minsky, were extremely optimistic about artificial intelligence's future. In order to fulfill their goal of creating a computer with human-level intelligence in a generation, they were given millions of dollars. It eventually became evident that they had significantly underestimated the intricacy of the undertaking. But it wasn't so simple to create an artificially intelligent creature. The U.S. and British governments stopped sponsoring undirected artificial intelligence research in 1973 after many studies critiqued the field's progress, in response to James Lighthill's criticism and ongoing legislative pressure. The difficult years that followed, which lasted from 1974 to 1980, were eventually dubbed "AI winter" (Huang, 2006).

British government funding for the subject increased in the 1980s, in part to thwart Japanese advances (Yang, 2006). However, the investors had become discouraged by the lack of the required computer power (hardware) by the late 1980s and had once again abandoned the project. Another meaningful winter, triggered by experience, occurred from 1987 to 1993. But after that, research continued, and IBM's Deep Blue became the first computer to defeat a champion when it defeated Russian chess champion Garry Kasparov in 1997 (Lohr, 2016). In the early decades of the twenty-first century, when machine learning was effectively applied to several issues in academia and business due to the availability of sophisticated computer hardware, investment and interest in artificial intelligence surged.

Several problems confronting the global economy were successfully resolved by the use of faster computers, advanced machine learning techniques, and access to large volumes of data (sometimes known as "big data"). According to the McKinsey Global Institute's famous article, "Big data: The next frontier for innovation, competition, and productivity," "by 2009, nearly all sectors in the US economy had at least an average of 200 terabytes of stored data." A "frenzy" of interest in artificial intelligence was triggered by the fact that the market for hardware, software, and other items

connected to the technology had expanded to over \$8 billion by 2016. According to Hampton et al. (2013), big data applications began to expand into other domains as well, including economics and ecological model training. Thanks to advancements in deep learning, particularly deep convolutional neural networks and recurrent neural networks, artificial intelligence (AI) has progressed to image, video, text, and audio recognition.

Significance of Artificial Intelligence (AI) in Nigeria

Even though many tasks are now completed by machines (Artificial Intelligence), practically everything in Nigeria is done by hand. As a result, in emerging countries like Nigeria, artificial intelligence is crucial to the technological landscape. Nigeria must take into account the significance of artificial intelligence in order to improve it. An increased support for humans. Since practically all labor in Nigeria is done by hand by people, there are a number of economic risks because of low output and a lack of interest in technology. However, artificial intelligence (AI) technology is effective enough to decrease human labor in a number of areas, thereby enhancing technology and production. A lot of developed countries are using artificial intelligence to build machine slaves that regularly carry out different tasks in order to increase production in a variety of economic activities. Artificial intelligence (AI) will help

humans complete tasks more quickly and accurately. The primary goal of AI is to create error-free and efficient worlds. Many countries have begun implementing AI technology in recent years to reduce human labor and to achieve faster and more efficient results, but Nigeria has not yet given AI the attention it needs.

A Greater Advance in Technology

In the industrialized world, scientists are riding the wave of artificial intelligence (AI) in the hopes that machine intelligence could eventually outsmart humans. Scientists think that if AI reaches its full potential, it will completely transform the technological landscape, and Nigeria won't be an exception if it gives AI development more priority. AI will advance to a point where robots will service humans or take over all of their duties. Humans may achieve more and advance technology by concentrating their abilities on more challenging tasks.

Creation of Greater Peace and Safety for Humans

The science of artificial intelligence has many advantages, but as with all great inventions, there are risks. The exploitation of this technology for self-centered and stupid purposes, namely the loss of human life, is one of these hazards. Regretfully, given her unstable ethno-religious divisions, Nigeria could be a glaring victim. There is already a strong movement to regulate this on a national and

worldwide level in order to protect human safety and maintain world peace.

Artificial Intelligence (AI) Challenges in Nigeria

Even with its creative significance and rapid advancement, artificial intelligence technology has encountered some major obstacles, particularly in underdeveloped countries such as Nigeria. To advance artificial intelligence, Nigeria must work to overcome these obstacles. Below are some of the challenges.

Obstacles Based on Religion and Culture

The two most frequent obstacles to development in Nigeria are religious intolerance and cultural affiliation; as a result, artificial intelligence (AI) is not exempt. Although language may not be a major obstacle to Nigeria's advancement in artificial intelligence, people who belong to the same tribe tend to be biased when it comes to collaborating with different tribes, particularly when it comes to learning new things. Similarly, in Nigeria, there is a great deal of religious bigotry that might work against AI technology.

Artificial Intelligence (AI) Human Interface

The problem here is that humans lack the data science abilities necessary to maximize artificial intelligence's output. The sophisticated skills necessary to bridge the gap between Nigerians and AI technology are conspicuously lacking.

Issues with the software

Human technology is not flawless. Researchers may find a software or hardware crash to be extremely frustrating, particularly in Nigeria, where storage and retrieval systems are inadequate. As a result, human-performed software tasks may be challenging to track down. This type of issue can be demoralizing and frustrating.

Complex algorithms

Huge amounts of data and complex algorithms are part of the technical side of AI, which can occasionally cause people to misunderstand its principles. It is challenging for many Nigerian academics to comprehend how AI technology works since they are totally ignorant of these algorithms and technologies. In addition, a large number of Nigerians avoid learning complex things.

Investment Decline

Another challenge with artificial intelligence in Nigeria is that not all managers or business owners are willing to invest in it. Setting up and implementing artificial intelligence requires a significant amount of money; thus, not all Nigerian organizations or business owners can afford it.

Artificial Intelligence (AI) Applications in Nigeria

In recent years, it has been known that machines are using cognitive intelligence to perform many more

intelligent tasks than humans and other animals do using natural intelligence (NI). The majority of developed countries have used artificial intelligence (AI) to expand every aspect of their economies and become global powers, and AI can also significantly influence the development of key sectors in the Nigerian economy. In the meantime, here are some examples of applications of artificial intelligence. It is important that Nigeria swiftly embraces artificial intelligence (AI) and start experimenting with many new things for a positive outcome and applications. In fact, artificial intelligence will be the best technology to support core sectors and assist Nigeria in its fastest digitization.

Education

Artificial intelligence technology can make Nigeria's education system smarter by introducing self-teaching classrooms at every level of the educational institution, where machines can be used to properly teach and answer on-the-spot questions in a universally accepted manner. In fact, 21st-century classrooms can be equipped with emerging technological solutions to deliver the best learning environment for students. It can also collaborate with virtual networks to create the ideal learning environment for both teachers and students. This is the most important sector in Nigeria that affects everyone's life, regardless of age or location.

Healthcare

In the Nigerian healthcare industry, artificial intelligence (AI) technology may undoubtedly provide better services. Without direct human input, medical data may be understood, and the appropriate conclusion can be drawn through the application of AI technology in the healthcare industry. It may be used for patient monitoring and care, customized medicine, medication development, diagnosis procedures, and treatment protocol creation.

Banking

Nigeria cannot be an exception to the global trend of banks and other financial institutions integrating AI technology into their systems, which can have a significant impact on the business and commerce of the country's banking sector. The application of AI technology in the banking sector can be used in payment efforts and reduce complex processes through simple chatbot conversations to continue operations without any hassles. Additionally, the banking sector in Nigeria can use AI technology in the field of intelligent virtual assistants to improve customer service.

Astronomy

Artificial intelligence's accuracy has been determined to be incalculable. Scientists have demonstrated that artificial intelligence computations can anticipate the long-term stability of circumlunar planets more

accurately than humans. This technology may thus be utilized to comprehend the functioning of our whole cosmos. This implementation could allow Nigeria to try its hand at space travel.

Construction

AI-based applications have broad potential in Nigeria's construction industry. To make lives safer, artificial intelligence (AI) could suggest the best safety features and create the best building designs. It has the ability to fix and comprehend complex languages. Consequently, artificial intelligence (AI) technology can increase engineers' productivity and enable them to produce high-quality work within the allotted time. The technology can also be helpful in examining the construction industry's operations and procedures.

Sports

Given its considerable potential, artificial intelligence (AI) technology has seen tremendous demand in the sports sector. Sportsmen and women may use this technology to enhance their experience and improve their performance, making sports more engaging. Using this technology would undoubtedly address a number of significant issues in Nigerian sports by fostering genuine competitiveness and ability amongst the nation's male and female athletes.

Agriculture

Nigeria's economy depends heavily on agriculture, and attempts are being made to alter the cultivation method to increase output. Artificial intelligence technology may be very beneficial. Timely planting, forecasting, fertilizer use, harvesting, and climate conditions are all things it can comprehend. Artificial Intelligence (AI) technology can be used to automate farming tasks and maximize agricultural productivity (McCorduck, 2004).

Prospect of Artificial Intelligence (AI) in the World of Technology

For many years, the idea of artificial intelligence (AI) has been a captivating theme in science fiction. This kind of "deep learning" enables robots to analyze information on their own at a very advanced level, enabling them to carry out intricate tasks like facial recognition. By utilizing neural networks, which replicate the functions of actual neurons, scientists have achieved advances in "machine learning." A lot of experts believed that the world's progress in AI technology had finally stabilized. The development of AI is, however, accelerating due to "big data," which opens up additional prospects for the future. Some potential applications of AI technology are as follows.

Automated Transportation

Although there are now self-driving automobiles, for safety reasons, a driver must be present at the wheel.

Even with these intriguing advancements, the broad use of driverless vehicles will require some time for public approval. But the U.S. Department of Transportation was compelled to publish guidelines to regulate varying degrees of automation when Google started testing a self-driving car in 2012. Other self-driving modes of transportation, such as trains and buses, are anticipated to appear shortly.

Taking Over Dangerous Jobs

Some of the most dangerous occupations, such as defusing bombs, are already being replaced by machines. These devices, which are technically drones rather than robots yet, are utilized as the physical equivalent of defusing explosives but need human control instead of artificial intelligence. Regardless of their categorization, they have been taking over one of the world's most hazardous tasks and saving thousands of lives. We'll probably see more AI integration as technology advances to support these devices. AI integration is also being reexamined for other occupations. Robots will soon replace welding, which is notorious for generating harmful chemicals, extreme heat, and deafening noise.

Cyborg Technology

Our bodies and brains are one of the primary limitations of being human. It is held by researchers that humans will eventually be able to improve many of their innate abilities and augment themselves with computers. There may be more useful reasons for

some of these potential cyborg improvements, even though many would be included for convenience. People who have lost limbs, for example, will soon be able to use AI to give them more control over their lives because the brain can communicate with a robotic limb. This type of cyborg technology would greatly lessen the daily limitations that amputees face.

Robots as Medical Personnel

In the medical field today, humans assist robots in performing procedures or provide patient care. Nevertheless, it is thought that in the future, completely autonomous surgical robots that are capable of making their own judgments would be able to operate on their own without the assistance of surgeons or medical professionals.

Effective Domestic Support

The increased demand for home workers worldwide is a result of the difficulties that many people face in their daily lives. Due to this, it has become harder and more expensive to get housekeepers to handle their care. At this point, AI will soon be able to replace this necessity. In the near future, home robots may take the role of housekeepers, assisting those in need with daily duties so they may remain in their homes as long as possible. Robots that serve as house guards or other security staff in houses will also be able to reproduce it (McCorduck, 2004).

Conclusion

An important component of intelligence is the capacity for logical reasoning, which has long been a primary area of focus in artificial intelligence (AI). Artificial intelligence (AI), which enables machines to learn from experience, adapt to new inputs, and perform tasks similar to those of humans, has revolutionized almost every field it has touched. If AI is purposefully prioritized in Nigeria, its revolutionary potential could have enormous benefits for the country's economy and society. The vast majority of AI instances that are currently in the news, such as self-driving cars and chess-playing computers, mainly rely on deep learning and natural language processing. In Nigeria, these technologies allow computers to be trained to perform particular tasks by processing vast amounts of data and identifying patterns in the data.

Recommendations

The following suggestions are offered to further the development of artificial intelligence in Nigeria, taking into account its significance, challenges, and applications: (i) New research and policymaking are required regarding the use of AI technology in workplace management, personnel monitoring, and hiring; (ii) Standards should be established to track the origin of various AI developments and the use of training data sets throughout their life cycle.

(iv) Organizations, universities, conferences, and other AI technology stakeholders should guarantee that women and minority groups participate in AI research and development. (v) The AI industry should hire experts from disciplines other than computer science and engineering and make sure they have good managers to AI development and usage. (iii) Appropriate processes to mitigate AI and unbiased strategies beyond a narrowly technical approach.

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