



ABSTRACT

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. Artificial intelligence in the last two decades has greatly improved performance of the manufacturing and service systems in many countries and Nigeria should not be left behind. The impacts,

ARTIFICIAL INTELLIGENCE IN THE 21ST CENTURY: ITS IMPACTS, CHALLENGES, PRESENT AND FUTURE PREDICTIONS IN NIGERIA

**AHMAD, MUHAMMAD NAJEEB; &
AHMAD, JALALUDEEN BASHIR**

Department of Computer Science, the Polytechnic Bali,
Taraba State, Nigeria.

Corresponding Author:

muhammadnajeebahmad@gmail.com

DOI: <https://doi.org/10.70382/tijsrat.v07i9.035>

INTRODUCTION

At the turn of the 21st century, we have actually realized that computers are everywhere around us: in our home, in the office, at the bank, when travelling or in any working organization. The way we interact with these computers made us to realise the creation of intelligent machines that work and react like humans with the help of digital electronics. Intelligence has been considered as one of the most important quality of human beings because every human behaviour has actually been ascribed to intelligence. According to Kumar (2018), human beings are the most intelligent of all the created animals in the world. Intelligence is most often studied in humans but has also been observed in non-human animals, plants and of late studied in machines. This study of intelligence in machines is referred to as Artificial Intelligence (AI), which is commonly implemented in computer systems using



challenges, present and future predictions of Artificial intelligence in Nigeria is the focus of this paper. This paper had actually checked out the future forecasts for artificial intelligence in Nigeria and also based upon which prospective remedy will certainly be suggested to solve it within following decades.

Keywords: Artificial intelligence, simulation, mimic.

programs through appropriate electronic circuits (Smith, 2006). The components of Artificial Intelligence (AI) are: learning, reasoning, problem solving, perception, planning and using language.

Artificial Intelligence (AI) according to Nwakunor (2021), is the computer controlled robots that think intelligently like human beings. These robots are controlled electronically with the aid of the computer by mimicking the competences of the human mind.

Artificial intelligence is the study and also advancements of intelligent machines and also software program that can reason, find out, collect knowledge, communicate, adjust and also perceive the objects. John McCarthy created the term in 1956 as branch of computer technology concerned with making computer systems act like people. It collaborates with the help of artificial nerve cells (artificial neural network) and clinical theories. Major Artificial Intelligence locations are Professional Systems, Natural Language Processing, Speech Comprehending, Robotics as well as Sensory Systems, Computer System Vision and also Scene Recognition, Intelligent Computer System- Helped Instruction, Neural Computing.

This research is to intimate the audience on the impact, adoption and challenges of Artificial Intelligent in Nigeria. The qualitative research method was adopted as well as expository approach was used for this study. Information was sourced from online search engines which are solely articles, journals and international publications.

IMPACTS OF ARTIFICIAL INTELLIGENCE (AI) IN NIGERIA

In Nigeria today, AI is still in its infancy stage. Although there are some organizations that are into it, but the most challenge they faced is lack of support



or proper funding. Most of the developed nations have used artificial intelligence to grow every facet of their economy to become world power. Similarly, Artificial Intelligence can be used to play a major role in shaping the growth of core sectors in Nigerian economy. What is paramount is for Nigeria to quickly adopt the AI technology and commence experiments in many new things for a positive outcome and applications. Indeed, the applications of AI technology will be the finest technology to give a boost to core sectors and help Nigeria for a fastest digitization. Meanwhile, below are some of the applications of Artificial Intelligence in relate to Nigeria (Reagan, 2018).

Education

This is the most important sector in Nigeria that touches every life regardless of the age and location. AI technology can make education system smarter in Nigeria. This can be done by introducing self-teaching classrooms at every level of the education institution.

AI can virtually replace classroom learning and provide the exact similar experience. Students at home, including teachers can all [be connected through virtual reality](#). The software running the simulation can set a classroom and depict the character of the students and teachers as they so desire. With the application of AI, the technology can learn from experience, adjust to new inputs, and perform human-like tasks. AI can allow the system to understand the student's learning profile, thereby personalising a suitable lesson plan to ensure the student learns effectively.

The major issues that might hinder effective e-education in Nigeria are connectivity – some locations don't have good internet connection, power shortage – insufficient electric supply.

Healthcare

Treatment, prevention and diagnosis of health conditions can be effectively achieved with the application of AI technology in Nigeria. Machine learning, through the use of statistical techniques, allows computer systems the ability to learn with data received, thereby making decisions with little to no human intervention.

In Nigeria, with information from AI, Doctors are able to assess risks, make better decisions, and give patients more effective medications. Complex medical



procedures such as kidney transplant, heart transplant which most Nigerians would otherwise prefer to fly abroad for, can be rest assured with the application of AI in Nigeria.

Banking

Banks and other financial institutions all over the world have begun adopting the AI technology into their systems and Nigeria cannot be an exception. It can create a huge impact on the business and commerce of the banking industry in Nigeria. The implementation of the AI technology in the banking industries can be used in the payment efforts and reduced complex process through simple chatbots conversation to continue the operations without any hassles. The virtual assistant can also be used to improve their customer services.

Agriculture

Agriculture is one of the core sectors of the Nigerian economy and efforts are been made to modify the cultivation process in order to yield more production. AI technology could be of immense help. It can understand a timely planting, getting predictions, using fertilizers, harvesting and climate conditions. Automation of farming activities is possible with the implementation of the AI technology and maximum output from agriculture can be achieved.

Astronomy

It has been ascertained that the accuracy of artificial intelligence is immeasurable. Researchers have shown that calculations carried out by artificial intelligence can make more accurate predictions than humans concerning the long term stability of circumlunar planets. Hence, this technology can be used in understanding our entire universe and how it works. This implementation could give Nigeria the ability to make an attempt into space.

Sports

Artificial intelligence in sports is emerging all over the industry, covering post-game analysis, in-game activity and even the fan experience. Some of the most exciting AI use cases in sports are: AI Referee (Referees, meanwhile now use Video Assistant Technology(VAR) in football to help them make more precise judgements regarding the big decisions, such as penalties, free kicks, and red



cards), personalized training and diet plans, player performance, ticketing and automated sports journalism. The implementation of this technology is certainly going to solve many major changes in the sports world of Nigeria by bringing true capacity and competition among sports men and women in the country.

Digital Personal Assistant

It can help organise meetings, answer questions by searching online, make recommendations, give directions, add events to calendar, send text messages, e-mails and notifications, language translation, initiate voice friendly notifications and tips.

Voice Interaction can enable easy interaction so you don't have to always tap your phone to initiate a task request. All you need do is speak to it, and it acknowledges your voice then performs the task. When privacy is demanded, a password can be set so that anyone does not access your data to perform unauthorized tasks. Advancements in the technology would permit more features peculiar to a real life personal assistant.

Autonomous Vehicles

An autonomous vehicle is essentially a self-driving car, engineered to move with little or no human effort. The vehicle, to an extent, can be able to operate itself without the need for a driver. AI technology found in an autonomous car gives it the ability to sense its surroundings and make intelligent decisions as to where to move, when to stop, and what to do in case of an emergency. Self-driving cars will solve a lot of transportation problems in Nigeria. Accidents on the highway will be reduced as these cars are able to adjust to the required speed and keep up with the changing surroundings. GPS technology, being integrated to the cars will allow them to take the best and safe routes.

Connected vehicle technology will allow cars to communicate, thereby limiting collisions. Although for this to take place, the cars must be on a Network such as 5G. The inherent danger in this is Car hacking, whereby the car is being manipulated by someone elsewhere.

The connectivity of self-driving cars can be manipulated by criminals to create gridlocks and accidents. Even if Nigeria was to implement connected cars, it will be reserved for the wealthy or those that can subscribe to 5G data plans to have their cars connected.



ADOPTION OF ARTIFICIAL INTELLIGENCE (AI) IN NIGERIA

The Nigerian Government is set to establish the center for AI and robotics under the National Informational Technology Development Agency (NITDA) which is anticipated to focus on Emerging Technologies in various areas such as research and development, communication security and networking. Furthermore, there is an ongoing private sector driven Robotic and AI Technology Hub and Research Centre called Robotics and Artificial Intelligence Nigeria (RAIN) that carries out physical and virtual classes, build intelligent machines, train, and certify youth on ultra-modern courses in automation, robotics, 3D printing, CNC machining, artificial intelligence (AI), data science, and machine learning (Ifejesu,2021).

Companies currently offering AI solutions in Nigeria:

- i. **AirSmat:** which provides AI-enabled software to businesses for drone data management.
- ii. **Kudi AI:** which provides an AI enabled chatbot to assist in the transfer of remittances to family and friends in Nigeria.
- iii. **Data Science Nigeria:** a foundation working to deliver research which can be transformed to business use applications. It conducts AI and Machine Learning boot camps and competitions.
- iv. **Robotics and Artificial Intelligence Nigeria,** which provides training in AI, ML and robotics development and automation.

FUTURE PREDICTIONS OF ARTIFICIAL INTELLIGENCE IN NIGERIA

Are robots going to take over our Future of Work in Nigeria?

The invention of artificial intelligence (AI) and its adoption in the workplace is not to substitute humans but to complement tasks with minimum error, less cost and within a short time. However, the use of AI in the workplace had displaced some workers on one hand and created more jobs on the others. A lot of jobs will be erased and changed. However, new jobs will be created. The new jobs will require more skills to cope with AI requirement. Some of AI technologies that are yet to be fully implemented in Nigeria are:

- i. **Automated transportation :** Self-driving cars already exist, though the vehicles are currently required to have a driver present at the wheel for safety. Despite these interesting developments, it will take a while for a public acceptance to bring automated cars into widespread use. But when



Google began the testing of a self-driving car in 2012, the U.S. Department of Transportation was forced to release policies to control different levels of automation. It is believed that other self-driving transportation means like buses and train will soon emerge.

- ii. **Cyborg technology:** AI will soon be used for people with amputated limbs, as the brain will be able to communicate with a robotic limb in order to give patients more control.
- iii. **Taking over dangerous jobs :** Taking over some of the most hazardous jobs like bomb defusing”. These machines aren’t quite robots yet, but are technically drones, being used as the physical counterpart for defusing bombs, but requiring a human to control them, rather than using AI. Whatever their classification, they have been saving thousands of lives by taking over one of the most dangerous jobs in the world. As technology improves, we will likely see more AI integration to help these machines function. Other jobs are also being reconsidered for AI integration. Welding which is well known for producing toxic substances, intense heat, and ear splitting noise will also be replaced by robots soon in the future.
- iv. **Robot as friends :** Presently most robots are still emotionless and it is difficult to picture a robot you could relate to emotionally. However, a company in Japan has made the first big steps toward a robot companion; one that can understand and feel emotions of human. Developed in 2014 and was called Pepper. About 1000 pieces of Pepper the companion robot was produced and all were sold in the year 2015. The robot was programmed to read human emotions, develop its own emotions, and help its human friends stay happy. More sophisticated friendly robots are sure to be developed soon.
- v. **Robot as medical doctors :** Presently in the medical field, robots are assisted by humans to carry out surgeries or treat patients. However, it is been believed that autonomous surgical robots can be used in the future to perform surgeries on their own without the help of surgeons and medical doctors in the future can be a fully autonomous robots that can make their own decisions.
- vi. **Improved house servants :** For many persons, everyday life is a struggle, hence the high demand for house servants all over the world. As a result, hiring house servants to manage their care is becoming scarce and



expensive. AI is at a stage where replacing this need isn't too far off. Home robots could soon replace house servants who will persons of needs with everyday tasks and allow them to stay comfortably in their homes for as long as possible. It will also be replicated to house guard robots who will perform the services of a gate man or security personnel at homes.

CHALLENGES OF ARTIFICIAL INTELLIGENCE (AI) IN NIGERIA

Despite the innovative importance and growth of artificial intelligence technology, it is indeed being faced with some significant challenges especially in developing nation like Nigeria. Nigeria as a nation must endeavour to overcome these challenges in order to improve artificial intelligence. Some of the challenges are seen below (Reagan, 2018):

Complex algorithms

The technical side of AI involves some huge data and complex algorithm; sometimes making users not to grasp AI concepts. A lot of researchers in Nigeria are completely unaware of these algorithms and technology, hence finds it difficult to understand the functioning of AI technology. Besides, many Nigerians tend to stay away from some complicated learning.

AI human interface

The challenge here is the shortage of data science skills within humans to get maximum output from artificial intelligence. There is a clear shortage of advanced skills that will interface between Nigerians and AI technology.

Decline of investment

Another challenge of artificial intelligence in Nigeria is that not all business owners or managers are willing to invest in it. The funds required to set up and implement Artificial Intelligence is very high, thus not every business owner or organization in Nigeria can invest in it.

Software malfunction

No technology of human is perfect. A case of software or hardware crash could be highly frustrating to researchers especially in Nigeria where storage and retrieval systems are poor. Hence, software tasks performed by humans can be difficult to trace. This kind of problem can be frustrating and discouraging.



Cultural and religious barriers

Cultural affiliation and religion bigotry are the two most common barriers to development in Nigeria; hence AI technology is not spared. Language might not be a much challenge to artificial intelligence progress in Nigeria, but persons of the same tribal affiliation are usually biased in working cooperatively with other tribes especially in knowledge acquisition. Similarly, there is so much religious intolerance that can seriously militate against AI technology in Nigeria.

CONCLUSION

Artificial Intelligent is one of the most discussed, researched and current Emerging Technology with inspiring and advantageous use cases growing on a regular basis. However, Nigeria is at its early stage into adopting the AI due lack of government support, less investment from private sector and inadequate volume of data collection. As stated in this paper, in the near future AI will improve human intelligence by re-educating of humanity to understand the technology's mechanisms and consequences. The use of AI systems will revolutionize many industries in the future and might change the future as we know it. This paper has figure out some recommendations and way out that if followed appropriately, Nigeria in the coming would be fully into AI space adoptions.

RECOMMENDATIONS

Considering the impacts, challenges and applications surrounding artificial intelligence in Nigeria, and in order to keep up with the continuous challenges and solutions concerning AI. the following recommendations are given to enhance its development. This paper recommends the following possible strategies in combating Nigeria in Adopting AI technologies like other developed countries;

- i. The Nigerian government should ensure proper implementation of AI technologies and should be monitored regularly.
- ii. The Nigerian government should partner with the private sector to implement digital verification signature in order to have “big data”.
- iii. Data Science Nigeria (DSN) should organize more programs to train the youth on the effective use of AI, to stabilize security in Nigeria.
- iv. AI course should be included in all Nigerian institutions of learning and should be monitored to ensure practical teaching of the course at all levels so that every graduate can operate the peripherals.



- v. To increase the awareness and adoption of AI, Companies, universities, conferences and other stakeholders in AI technology should ensure the participation of women and minority groups in AI research and development.
- vi. The Government should render support and collaboration to center for Robotics and AI upon its launch, in order to carry out a holistic needs and challenges review, as well as the creation of a White paper on Robotics and AI for Nigeria.

REFERENCES

- Adejo, A.A, Alhaji & Misau, A.Y. (2021). Application of Artificial intelligence in academic libraries in nigeria: *Library Philosophy and Practice (e-journal) (e-journal)*.6639 Retrieved from <https://digitalcommons.unl.edu/libphilprac/6639>.
- Big data and the future of ecology: *Frontiers in Ecology and the Environment*. 11 (3): 156– 162.
- Hampton S.E, Strasser C.A, Tewksbury J.J, Gram W.K, Budden A.E, Batcheller A.L, Duke C.S, Porter J.H (2013).
- Huang, T (2006). AI Winter and its lessons. Washington: *History of Computing CSEP 590A*.
- Ifejesu, Ogunleye.(2021). *Artificial intelligent for economic development In nigeria*, p 11
- John, V. (2020). Application of Artificial Intelligence (AI) in Nigeria. *Geeky Nigeria* Retrieved from <https://geeky.com.ng/applications-of-artificial-intelligence-ai-in-nigeria/>.
- Kumar, M (2018). Is human being the most intelligent and wise among living beings.
- Lohr, S (2016). IBM is counting on its bet on watson, and paying big money for it. New York: New York Times.
- McCorduck P (2004). Machines who think. Artificial intelligence. Pp.340–400.
- McGuire B (2006). History of AI applied to Chess. Washington: *History of Computing CSEP 590A*.
- Nwakunor, J. A (2021). Leveraging artificial intelligence to enhance brand management.
- Reagan N. R (2018). Artificial Intelligence: Its Importance, Challenges and Applications in Nigeria. *Direct research journal of engineering and information technology*.
- Smith, C (2006). The Turing Test. Washington: *History of Computing CSEP 590A*. The Guardian Newspaper: The Guardian Group, Rutam House, Isolo Lagos, 37, (15), 524,3.