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An Investigation into the Extent of the Use of Artificial Intelligence in Nigeria Banks

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ABSTRACT

The study investigated the extent of use of artificial intelligence by banks in Nigeria.Survey method was adopted for the study. Structured questionnaire was administered to the representatives of the banks. A total of 22 questions was designed for the research questionnaire. The questions borders on whether the banks use artificial intelligence applications, the type of application, the extent the application can work and the need to introduce new artificial intelligence application in the bank. The result shows that four banks in Nigeria use artificial intelligence for banking transactions. The result also shows that the extent of use of the artificial intelligence application is by use of chatbots, and that many banks were interested in adopting artificial intelligence application for their operations. The paper ends will a call for the management of the banks to adopt artificial intelligence in their operations as the advantages of artificial intelligence applications in banking are enormous.
Keywords: artificial intelligence, banking, chatbots, and robotics.

INTRODUCTION

What is Artificial Intelligence?

Artificial Intelligence (AI) is a field that was developed to assist man in his basic operations. The field of study of AI spans across different disciplines from where it draws its functions. It is an area that fully asserted its presence around the 1960s when the wave of industrialization was cutting across Europe and other Western axis.

Artificial intelligence according to [1] is defined as any device that perceives its environment and takes action that maximize its chance of successfully achieving its goals. [2] opined that AI includes the development of computer-based systems that can learn from past behaviours and apply that knowledge to solving future problems.AI derives from the concept that human intelligence can be so precisely described that a machine can be made to simulate it [3]. AI can also be viewed as making computational models of human behaviour that involves programs which behaves exactly like humans. It involves experimenting through cognitive science in human beings to see how they behave in certain situation and how to make computers behave in that way. It also involves modelling human thoughts and his intelligence. This is very important because without developing appropriate algorithm for a human thought, it will be difficult to develop a program for an action.

From the above concepts, it can be inferred that AI involves having a device, or machine, that hasthe ability to study the environment in which it operates such that it will learn how things in the environment work and be able to improve the environment and progress the system. The basic tenets of AI from this perspective therefore are to let the machine learn, adapt and improve. The machine or device is simply the computer systemand other computing devices which have had tremendous improvements in the areas of software and hardware areas such that complex activities can be handled.

Developing such a machine involves a lot of processes. It involves modelling human behaviour, modelling human thought, modelling machines that behave intelligently and modelling machines that behave rationally.Turning proposed that if a human could not distinguish between responses from machine and a human, the machine could be considered intelligent. [4].

AI Technology

The traditional domains of AI include reasoning, knowledge representation, computer vision, robotics, planning,

learning, national language processing, perception and the ability to move and manipulate objects [5].

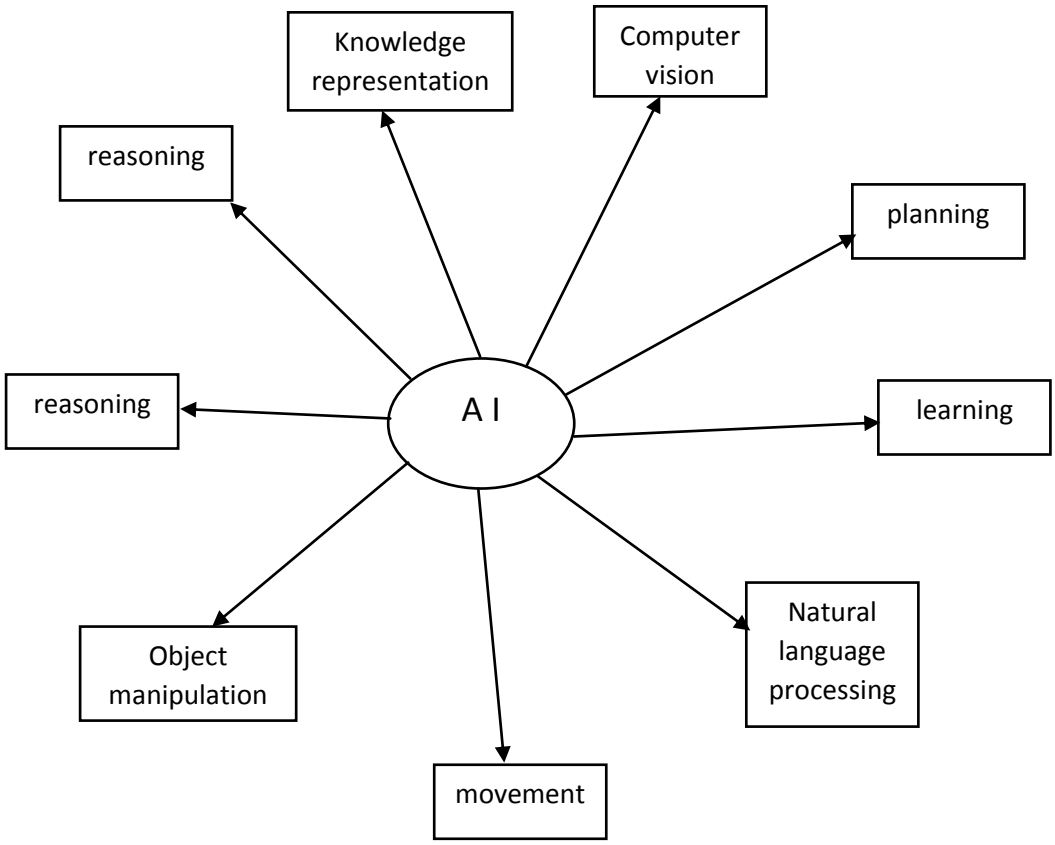

Fig. 1Traditional domains of AI

AI tools include search trees, mathematical optimization tools, artificial neural networks, statistics, probability and economics. Also, AI is built around algorithms. An algorithm is a set of instructions that a computer can execute. AI algorithms are capable of learning from data and making improvements by adopting new heuristics that have worked well in the past. AI equally uses symbolism (using formal logic), deep learning, Bayesian networks, evolutionary algorithms, and use of agents. Agents are software that gather information about an environment and takes action based on the environment.

Applications of AI in banks

Banks increasingly depend on data and information for its operations. Increase in population which increases the population of bankable persons creates demand for reliance on information systems and modern technologies that will provide services that are fast and efficient.

[6] inferred that the areas AI are applied in the banking industry include automatic cheque re-order facility which banks use for performance evaluation, credit evaluation of customer and

products like customized investment advice for customers after portfolio analysis and customized investment solutions after evaluating the credit history as well as income pattern.

[7] in his own concept enumerated the areas of AI technology applications in banking and finance to include personalized financial services, smart wallets, underwriting, voice assisted banking, data-driven applications for lending decisions, customer support, digitalization of branch lines, and blockchain hastening payments.

Some of the problems of artificial intelligence has to do with how to effectively model a system that can handle reasoning. When a problem is simple it is easier to model but when it is complex, the algorithms proved to be insufficient because they experienced combinational explosion and they became exponentially slower as the problems grew larger [8].

[9] opined that three reasons why AI is becoming increasingly implemented is because data is available, the computer power is available and there are breakthroughs in algorithm efficiency. He enumerated three types of learning as unsupervised learning (using statistical tools for data clustering to find hidden patterns without any external feedback), supervised learning (where a machine is trained for a specific classification task using labelled data and direct feedback) and reinforced learning (algorithms learn to react to an environment by repeating strategies over and over while maximizing rewards). He enumerated five main areas where artificial intelligence is used in finance to include investing – asset management, credit scoring-underwriting, regulatory compliance –fraud detection, market research – reporting, and customer support – assistants. He enumerated the challenges of AI to include data quality, black-box effect, narrow focus, responsibility and global risk for incumbents.

[10] enumerated 4 ways AI will impact the banking industry to include improved and cost effective service (available 24 hours), better management (advice to customers), know your future prospects and returns (continuous update of data) and precise investment information and research (exact information and facts).

Ways AI handles banking problems customer services digital support (use of smart phones), scam recognition, biometric identification, and client personalization.

The benefits computer applications have in the banking industry have been evaluated by different authors. [11] examined the impact of IT on banking productivity and concluded that higher levels have been achieved without corresponding increase in employees. [12] discovered that use of technology can improve/enhance systems for administrative control.

PURPOSE OF THE STUDY

The purpose of this study is to find out if banks in Nigeria use AI in their banking activities. If they do, to find out the type of AI services that they utilize and there is need to introduce new AI applications or expand the existing applications that banks are using.

METHODOLOGY

The study involved administering standard structured questionnaire to the 22 commercial banks at their head offices in Nigeria. Each bank representative fills the questionnaire and returned it to the researcher. The period of the research was july 12th – 26th 2018. The questionnaire was designed to find out the extent of AI application in their respective banks.

FINDINGS

It was discovered that few banks make use of ruled-based chatbots. The banks are UBA that has LEO, Diamond bank that has Ada, Access bank that has Tamara and Stanbic IBTC that has Sami. The chatbots are used to perform some basic banking operations like having conversation with a person, airtime purchase, bills payment, stock trading, and money transfer via social network like Facebook Messenger.

DISCUSSION

Chatbots are end products of AI but presently not sufficient to handle expected AI tasks in the banking sector. AI relies heavily on data and most of the data are obtained from social media. Reliability and accuracy of data that are obtained from social media such as Facebook, WhatsApp, Instagram, etc. however raises a lot of concern. The personal data that some customers gave in the bank are quite different from the ones they provided in some of the social media. These observations were identified in their age, names, city and at times their names. Chatbots are not only supposed to handle tasks such as balance inquiry, bank account details, loan queries, etc. but apply a high degree of deep learning, using previous pattern and knowledge. Present chatbots have a lot of limitations. For instance, the dialogue capability of chatbots can be limited to a very specific set or format of questions that are established by the chatbot development team, there are limitations based on accents and languages, and chatbots cannot answer multiple question at the same time [13].

Other aspects of AI technology in the banking sector such as Robotics Process Automation (RPA) are not effectively utilized. RPA are used to quickly and accurately manage high volume processes over complex infrastructure by keeping detailed logs of activities and generating reports that can be used by an auditor. It is used to handle high demands for auditability, security, data quality and operational cost. The benefits of robotics in banking include

cost saver, time saver, integration, higher quality, scalable solutions and local competency [6].

Other areas of AI applications in the banking sector, such as cognitive computing and Internet of Things (IoT) are not utilized by the Nigerian banks. Cognitive computing deals with hardware and software that mimics human brain and helps to improve human decision. Cognitive computing systems simulate human thought processes [1]. Cognitive computing integrates artificial intelligence and signal processing to mimic human behaviour. They are self-learning systems that use a variety of data, predictive analytics and natural language processing [11]. Cognitive computing can effectively be utilized in the banking sector for personal banking directives, wealth management advice, maintaining data quality, efficient data management, effective security and privacy management, trading, etc.

Internet of Things (IoTs) is a network of connected devices through the Internet that interact and share resources by sending and receiving data. In the banking sector, IOTs enables banks to analyse the way certain models are utilized. For instance, banks can utilize IoTs to know how ATMs that were installed in given area are utilized. With the information gathered, banks can know whether to increase the number of ATMs installed in an area or whether to reduce the number of the ATMs. IoTs also enable banks to gather information about customers. Banks could use such information to identify customer business needs, fears, and plans so that they can know how to respond to their varying request. With that, trust is established with customers. IoTs can be used to predict fraud in debit/credit card transactions. IoTs with linkage to sensors can be used to track and monitor customer stock inventory to know when goods are sold so that they can demand for loan repayments.

CONCLUSION

Most banks in Nigeria are not utilizing AI applications in their activities. Four banks are using chatbots applications which are only one aspect of AI applications in banks. The benefits of AI applications in banking are enormous. Most banks are not effectively utilizing robotics process automation, cognitive computing systems and Internet of Things which are gaining presence in the banking sector.

RECOMMENDATIONS

Management of banks in Nigeria are encouraged to adopt AI applications in their operations. Those who are already using AI applications are encouraged to expand and include applications such as robotics process automation, cognitive computing systems and Internet of Things. They should also invest in more AI products as the benefits of AI are enormous.

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QUESTIONNAIRE

Please tick √ as appropriate

1. Does your bank use Artificial Intelligence (AI) application? Yes No
2. Does your AI application have chat bots? Yes No
3. Does your AI application have voice bots? Yes No
4. Does your AI application use voice recognition for password? Yes No
5. Does your AI application use facial recognition for password? Yes No
6. Does your AI application sort customer data and create a pattern? Yes No
7. Does your AI application learn from existing pattern? Yes No
8. Does your AI application handle perceptual events? Yes No
9. Does your AI application handle cognitive events? Yes No
10. Does your AI application handle online trading? Yes No
11. Does your AI application sort trading event? Yes No
12. Does your AI application make use of robots? Yes No
13. Does your AI application spot pattern which can indicate anomalies? Yes No
14. Does your AI application handle risk management? Yes No
15. Does your AI application make use of virtual assistants? Yes No
16. Does your AI application handle anti-money laundering? Yes No
17. Does your AI application handle real-time transaction analysis? Yes No
18. Does your AI application handle credit analysis? Yes No
19. Does your AI application handle investment analysis? Yes No
20. Does your AI application cut cost? Yes No
21. Do you need a new AI? Yes No
22. Please suggest any new thing you feel that AI can do? Yes No