

Artificial Intelligence: Opportunities, Issues and Applications in Accounting and Auditing in Nigeria

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Abstract

Artificial Intelligence (AI) could be a game-changer for business generally and professional services in particular. With the rapid developments in machine learning, data mining and cognitive computing, the next decade promises to see huge leaps forward. While the excitement over the potential applications of AI is understandable, there are issues related to adaptation and application in developing countries, particularly Africa and indeed, Nigeria. This paper reviews the nature of accounting and auditing problems and the need for application of artificial intelligence (AI) technologies to the discipline. The discussion includes current accounting issues for which new AI development should be fruitful, particularly auditing. This paper concludes with future roles of banks going forward and the impacts AI could have on auditing systems.

Keywords: Artificial intelligence; Automation; Technological process reframing; Workforce; Expert systems

Introduction

Banking modernization and architecture has been progressive over the years. From the creation of the first banks during the middle ages, the greatest virtues in finance included stability, security, wealth and trust. These principles in the explanation of Hawser [1] were visible in bank building designs: solid, hulking constructions that impressed on the clients that the banks had lots of money and that the clients' money is safe with them. As the banking sector and finance modernized, bank architecture also moved with it. In Nigeria, the buildings became more imposing and innovative; there are glass houses and sky scrapers head offices of banks. They impressed on the clients not only financial power and security, but also the value of innovation.

The financial modernization continues today with the architecture and infrastructure increasingly built on technological tools instead of "brick and mortar". More and more banking infrastructure is being built on artificial intelligence.

Artificial intelligence (AI) in and of itself is not new. Joel [2] noted that AI as a tool for the banking sector, analytics that provide insight on positive and negative trends have been around for some time. In the past, analytics and AI have been used for applications such as anti-money-laundering. Now, however, banks are using them to help companies optimize their decisions with predictive capabilities. Sitoyo in Hawser [1] avers that the banks of the future will be AI-driven. Sitoyo, director of financial services at Safaricom, which launched one of the first mobile-money-transfer services in Africa, M-Pesa, says that the key technologies will be the Smartphone, machine learning, AI, big data and robotics. M-pesa is now joined by other upstarts in finance called challenger banks or neobanks. This new generation of banks, platforms or ecosystems, are making transactions easier, faster and more transparent.

In terms of the financial services sector, Brewer in Joel [2] averred that AI development and implementation is occurring in a somewhat divergent manner. The financial services approach is viewed in the perspective of whether the use is focused on customer interaction or transaction processing. With respect to customer interaction, the focus of AI seem to be on online, real-time and interactive tools which is often in the area of sales, advice and fraud detection. While in the later case, AI is built around periodic, offline automation approaches.

Given the penetration of AI into Africa and increased acceptance by banks and its clients, Charles, chief executive officer of Ecobank Nigeria suggests that compliance, know-your-customer and anti-money laundering regulations will be more important than ever. This essentially implies that auditing functions will have to be reviewed and modernized to meet the emerging financial ecosystems. The term "AI" as described by Jeane [3] are computing systems that exhibit some form of human intelligence. It covers a number of interlinked technologies including data mining, machine learning, speech recognition, image recognition and sentiment analysis. This, according to him is exemplified by machine learning which may be used to automatically code accounting entries. By creating sophisticated machine learning-based models, auditors can also improve fraud detection. The auditing process is further transformed by deep learning, a form of AI that can analyze unstructured data such as emails, social media posts and conference call audio files and synchronize with financial details.

In Recognition of the massive potential in AI, large accounting firms are making the most of it. Raphael [4] asserted that, with the effective implementation of cognitive technologies, the audit process will become "smarter, more insightful, and more efficient. He sees this as the future of the audit profession, and the users of financial statements deserve it. KPMG, in March 2016, [5] announced that it would work with IBM Watson to apply cognitive computing technology to its professional services offerings. The idea is that the auditor will use Watson to analyze massive volumes of financial data to detect anomalies. For example, "by scaling human skills and judgment through the application of cognitive technology across a bank's commercial mortgage loan portfolio, auditors gained a more

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detailed and comprehensive understanding of the bank's credit files and potential audit exceptions based on loan grading.

Contextually, Artificial Intelligence (AI) with respect to auditing is defined as a hybrid set of technologies supplementing and changing the audit process. Audit procedures are a direct consequence of available technologies. The advent of computers changed the scope and the methods of examination. The advent of analytics is predicted to change the time scope of the audit (more proactive than reactive), the efficiencies, and the cost as well as the benefits of the work. The advent of AI will embed human-like activities into automation. In general, it is thought that technology applied to audit allows activities to be performed more effectively and more efficiently [6,7].

Artificial Intelligence (AI) applications expands the focus of auditors beyond the limited information provided by financial statements, to taking advantage of textual data from social networks, video recordings, captured imagery, sensor data (e.g., GPS locational data, RFID data), and combines the extracted features with accounting and financial information. The various functions of deep learning allows auditors to automate a number of tasks such as reviewing source documents (e.g., bank check, deposit slip, sales invoice), processing paper work, analyzing conference calls, emails, press release, news, and extract metadata from them, all of which could be additional supporting evidence used to supplement traditional financial attributes. These functions serve financial statement analysis, which is a comprehensive task. When auditors analyze financial reports, the machine scans and identifies each account and its balance and links these numbers to the related supporting evidences automatically, thus enabling the detection of irregularities [8].

How AI will influence the auditing profession

Financial organisations are generating and collecting large amounts of data on a continuous basis, from points of sale, other transactions up to inventory counts all in real time. Additionally, information from exogenous sources, in the form of social media and news feeds to name a few, is readily accessible and available for analysis. It is, in fact, the application of AI to this type of Big Data that is expected to take the auditing profession a step forward. With such large databases, traditional audit procedures become less effective and efficient, which necessitates a rethinking of the way audits are conducted [9].

A number of studies in the social sciences literature have found that humans perform poorly in the complex tasks that require the collection and aggregation of excessive information from multiple sources [10]. It has been well documented in the accounting and auditing literature that exposure to large amounts of information can potentially lead to increased ambiguity, information overload, difficulty identifying relevant information and patterns and, consequently, lead to suboptimal audit judgment [11-14]. This problem is exacerbated by the unstructured nature of Big Data and the high level of complexity and ill structure involved in certain audit tasks, such as the evaluation of internal controls. Hence the new methodologies can assist auditors in overcoming the aforementioned limitations. The increasing maturity of AI technologies, more specifically deep learning technology, such as visual recognition, textual analysis, natural language processing, and audio processing, provides unlimited potential and inspiration for its application to auditing [8].

The challenge

Artificial Intelligence (AI) could be a game-changer for business and professional services in particular in the knowledge economy. Accelerated advancement in machine learning, data mining and

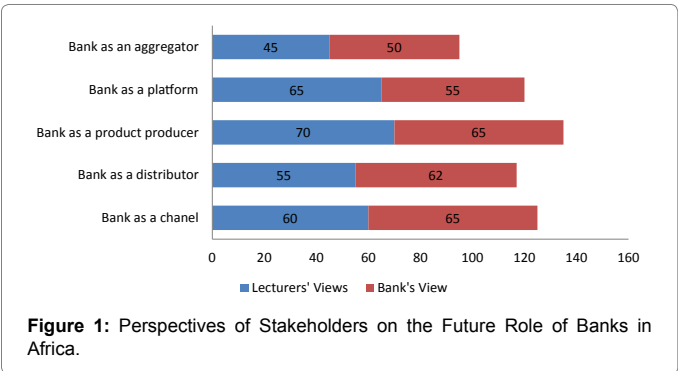
cognitive computing, the next phase of innovation in AI holds the promise of leading innovation in the global economy going forward. While the excitement over the potential applications of AI is understandable, there are some issues arises and indeed fears developing. There is a general consensus among experts that AI will in fact replace humans in the value chain, that is, doing the tasks currently done by humans and performing such functions faster and more accurately. Consequently, rendering many of people redundant. This fear is real among policy makers and advocates in Africa. African nations are challenged with growing graduate unemployment. If the few blue collar jobs created are taken over by AI, then there will be a serious crisis in the society, one most governments are not willing to talk about right now. The situation right now is that of "let us wait and see". But African leaders are handicapped, the AI revolution is already spreading across the continent. At the moment, it is helping companies provide efficient services and create new jobs across the continent. As it deepens and becomes more sophisticated, it will start to take jobs away from Africa. It is inevitable. Another challenge of the AI revolution is the changing job skills and demands it will place on workers and the need for review of educational curriculums across Africa to teach skills demanded by new technologies and applications in order for graduates to qualify for job openings. Experts are predicting that the banks of the future will be AI driven, thus, training institutions must align curricula to new opportunities and match training to new job skills. Furthermore, not everyone is fully convinced of AI, that the reality matches the promise. How far will the research and development on AI with respect to the financial sector go and how much of these will be adapted to the financial sector? The industry has seen many reforms and regulations and still, has crafted its own means of evolution. AI will be embraced, but may not totally overhaul the sector as some are predicting. *Felice and Jeanne* [15] averred that society is still a long way from reaching a point where AI can replace human judgment, skepticism or personal experience, yet clearly there will be ongoing change to existing business models and it will potentially alter the way organizations operate.

Method

This research employed both a qualitative and quantitative research design. The study was carried out using a descriptive survey research design, employing secondary quantitative data. The descriptive design was considered appropriate for the study because according to Kothari [16] the survey was concerned with describing, recording, analyzing, and reporting conditions that exist between and among variables. This study was conducted in Nigeria using stakeholders such as bank executives and university dons with majors in accounting and economics from Universities in Akwa Ibom State, Nigeria. Purposive sampling was used to select 45 stakeholders to form part of the sample. The researchers' development instrument titled "Artificial Intelligence and the Future of Accounting in Africa Questionnaire" was used for data collection. This instrument was validated by experts and pilot tested on 15 respondents to determine the internal consistency. Cronbach alpha technique was used to estimate the reliability index, which stood at 0.82. The instrument was then administered in a period of 10 working days. The frequency and Mean were used to answer the research questions.

Presentation

Figure 1 shows the bar chart summary of faculty and banks' views as to the future role of banks. A cursory look at the result shows that 45% of faculty see bank as an aggregator in the future while 50% of



S/N		X	σ	Remarks
1	Materiality and risk analysis	3.35	0.84	*Agreed
2	Contract review process	3.28	0.92	*
3	internal control evaluation	3.07	1.19	*
4	audit planning,	3.08	1.06	*
5	evidence evaluation	3.55	1.03	*
6	specific account analysis	3.32	0.95	*
7	internal auditing	3.35	0.82	*
8	Implementation of substantive tests	3.23	1	*
9	Choosing an opinion	3.28	0.88	*
10	Audit report issuing	3.55	1.03	*

Table 1: Summary of Changes in Audit Conceptualization that will be facilitated by AI.

bank executives see banks as an aggregator in the future. On banks as a platform in the future, 65% of faculty agreed while 55% of bank executives agreed. On product production, 70% of faculty agreed on its future role and 65% of bank executives also agreed. On the future role of banks as a distributor, 55% of faculty agreed while 62% of bank executives agreed. On banking as a channel, 60% of faculty agreed and 65% of bank executives also agreed.

Table 1 shows the responses of stakeholders on identified areas in auditing system, where AI might facilitate changes. The result shows that all the items have mean responses above 2.50, indicating that all the respondents all agreed to the effect of AI on auditing process.

Discussion of Findings

The result of analysis shows that AI integration will facilitate changes in the auditing process. It was established that there will be changes in Materiality and risk analysis, internal control evaluation, audit planning, evidence evaluation, contracting, specific account analysis, choosing an opinion, report issuing and internal auditing. This findings is in line with [3], which asserted that AI could aid the audit system in contract review. Machine learning tools allow humans to analyze a larger number of contracts, such as leases, in a much shorter timeframe than is possible with a traditional manual review. In a recent pilot, AI tools were able to accurately extract information from lease contracts using pre-selected criteria in the vast majority of cases, a higher level of precision than the average human reviewer is capable of. Auditors through AI assisted systems can ask better questions and interact better with stakeholders, including financial officers, audit committees and company boards, thus, adding value to the audit process. This findings is akin to Issa, Sun, and Vasarhelyi, [8], which

found that through AI visual recognition techniques, auditors are able to “understand” the content of an image taken by a drone or video captured by surveillance cameras, automatically identify the object and subject (including human faces) in the image, and subsequently organize and classify each image into a predefined logical class. Such technique can facilitate the automation of assets and inventory checks and fraud detection.

Result of analysis showed the future role of banks. This includes bank as a channel, banks as distributors, product producers, aggregators and banks as a platform. The result further showed the similarities in the perspectives of faculty and bank executives. This finding is in line with Capgemini 2017 [17] report on insider perspectives on the future role of banks.

Conclusion

Africa is just beginning to see the increased penetration of AIs in its financial sector. It is obvious that different member states are at different levels of AI application, but the effect has been profound, prompting further investments and diversified applications. However, as the effects of AI from products to services, its disruptive nature would become apparent.

References

1. Hawser A (2018) The bank of the future. Global Finance 32: 8-12.

2. Joel K (2017) The future is now. Global Finance 31: 52.

3. Jeane B (2018) How artificial intelligence will transform the audit –EY.

4. Raphael J (2015) How Artificial Intelligence Can Boost Audit Quality.

5. KPMG (2016) Game Changer: The Impact of Cognitive Technology on Business and Financial Reporting.

6. Deloitte (2016) Deloitte Forms Alliance with Kira Systems to Drive the Adoption of Artificial Intelligence in the Workplace.

7. Morrison A (2016) Blockchain and Smart Contract Automation: How Smart Contracts Automate Digital Business. Pricewaterhouse Coopers (PwC).

8. Issa H, Sun T, Vasarhelyi M (2016) Research ideas for artificial intelligence in auditing: the formalization of audit and workforce supplementation. J Emerging Technologies In Acc 13: 1-20.

9. Dai J, Vasarhelyi M (2016) Imagineering Audit 4.0. J Emerging Technologies in Acc 13: 1-15.

10. Kleinmuntz B (1990) Why we still use our heads instead of formulas: Toward an integrative approach. Psychological Bulletin 107: 296-310.

11. Stocks M, Harrell A (1995) The impact of an increase in accounting information level on the judgment quality of individuals and groups. Acc Organizations and Society 20: 685-700.

12. Alles MG, Kogan A, Vasarhelyi MA (2008) Putting continuous auditing theory into practice: Lessons from two pilot implementations. J Info Systems 22: 195-214.

13. Alles MG, Brennan G, Vasarhelyi MA (2006) Continuous monitoring of business process controls: A pilot implementation of a continuous auditing system at Siemens. Inte J Acc Info Systems 7: 137-61.

14. Brown-LH, Issa H, Lombardi D (2015) Behavioral implications of Big Data's impact on audit judgment and decision making and future research directions. Acc Horizons 29: 451-68.

15. Felice P, Jeanne B (2017) What Impact Will AI Have on the Audit?

16. Kothari CR (2004) Research Methodology: Methods & Techniques 2nd edition. New age International Publishers New Delhi, India.

17. Capgemini (2017) World banking report 2017.