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Data Analytics Tools And Techniques In Auditing Financial Statements

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ABSTRACT
The research on Investigating the Use of Data Analytics Tools and Techniques in Auditing Financial Statements was undertaken to discover the use of data analytics tools and techniques in the Financial Statement. This is prompted by the need of such knowledge in today's auditing and accounting for the fact that the work of auditors is indeed onerous. This tool will be an aid to their work when the needed skill is acquired. Methodology in this study is the library search which involved journals, textbooks, web search like Wikipedia and any other Pdf articles. Literature Review on Investigating the Use of Data Analytics Tools and Techniques in Auditing Financial Statements was between 2015 and 2023, to see the views of other scholars and finally recommendations were made.
Keywords: Data Analytics, Auditing, Data Analytics tools.

INTRODUCTION

The integration of data analytics in auditing has the potential to enhance audit quality, improve efficiency, and provide deeper insights into financial reporting. Janet Morgan Riggs an American Professor of Psychology once said in one of her articles that the obligations imposed on auditors is onerous (Wikipedia en.wikipedia.org). She cited the celebrated case of Kingston Cotton Mill Company (No 2) as far back as (1896) as found in the Wikisource, in that case, Lord L. J. Lopes made a similar statement – that the work of auditors is onerous. If the obligation of auditors were onerous in those days, then it is much more now that volume of financial data and Complexity are on the increase. These have created a pressing need for auditors to leverage on data analytics tools and techniques in auditing financial statement. The hirers of accountants now desire those who can leverage on Data Analytics, these are ones who understand the data results in context of accounting, and can put those results into reports which communicate accounting and auditing information effectively, Durtshi and Wang (2020). This study tries to examine the use of data analytics tools and techniques in auditing financial statements.

One thing is constant, and that is change. As days go by new discoveries continue to emerge. Financial accounting as well as auditing is not immune to this, hence an advancement in financial reporting and auditing technique. Suffian, Kassim, Zin and Surticanti (2023) discovered that in recent years, the field of accounting has been undergoing a profound transformation due to the rapid advancement of technology. The traditional audit approach, which relies heavily on manual sampling and testing, is no longer sufficient to address the complexities of modern financial reporting. Data analytics offers a powerful solution, enabling auditors to analyse large datasets, identify anomalies, and detect potential misstatements. Among the most prominent innovations is the integration of Big Data Analytics (BDA) into accounting practice (Gamage, 2016)

The need for Data Analytics in Auditing includes, Big Data: The exponential growth of financial data requires auditors to adopt data analytics tools and techniques to process and analyse large datasets. Another reason why auditors need this technique is Regulatory Requirements: Regulatory bodies are increasingly emphasizing the importance of data analytics in auditing, driving auditors to adopt these tools and techniques. This is actually because no profession would admit to be left behind the trend of technological advancement. Audit Quality is yet another driver of Data Analytics in Auditing: Data analytics can enhance audit quality by providing more robust and reliable evidence, improving the accuracy of audit findings.

The objective of this research is to investigate the use of data analytics tools and techniques in auditing financial statements, with a focus on identifying best practices, challenges, and opportunities for improvement.

Conceptual Review

Data Analytics

According to Chaurasia and Rosin, (2017) Data Analytics is the process of analysing data to uncover patterns using computational algorithms, programming and statistical modelling techniques to find valuable and timely correlations. Data analytics is the process of examining and analyzing data to draw conclusions, identify patterns, and make informed decisions. It involves using various techniques, tools, and methods to extract insights from data. Data analytics involves using statistical and machine learning techniques to analyze data and extract insights. The increasing complexity of financial transactions and the vast amounts of data generated by organizations have transformed the auditing landscape. Data analytics tools and techniques have emerged as essential components of modern auditing, enabling auditors to analyze large datasets, identify anomalies, and detect potential misstatements.

Data Analytics Tools Used in Auditing the Financial Statement

These are tools used for executing auditing task when using Data Analytics, they include,

(a) Data Visualisation Tools; Tableau, Power BI.
(b) Statistical Analysis Tools; R, Python
(c) Machine Learning Tools; Scikit-learn, TensorFlow, Py Torch.
(d) Data Mining Tools; RapidMiner, KNIME.

These tools are used at different stages of audit when auditing the financial statements. For example, at the planning stage, data analytics helps identify areas of high risks. At substantive testing stage, Data Analytics enables auditors to test large datasets. At analytical procedures, it helps the auditor identify unusual trends and relationships.

These tools possess some features like Data ingestion (ability to collect and integrate data from various sources), Data Processing, (ability to clean, transform and analyse data), Data Visualisation (ability to present data in a graphical or visual format), Machine Learning (ability to build predictive models and perform advanced analytic), Collaboration (ability to share insights and collaborate with others). These qualities make them helpful.

Auditing

Auditing is as old as stewardship and business. The word audit actually emanated from the Latin word "Audire", which means he hears. This is a scene in the early or primitive stage of auditing when a master listens to his steward recount his stewardship (what was given to him, what has been sold and what remains) orally. The master who listens to him then is the auditor. Howbeit, today, auditing has metamorphosed into a profession. An audit today is a careful and unbiased examination of and enquiry into any statement of account relating to money worth, (Odum and Odum, 2017).

The auditing Standard defines an audit as the independent examination and an expression of opinion on the financial statement of an enterprise by an appointed auditor in pursuance of that appointment and in compliance with any relevant statutory obligations.

We can see from the above that an auditor should be independent in carrying out the work of auditing and should follow statutes. The end product of the audit work is the opinion expressed by the auditor which may be qualified or unqualified opinion. The work to be done depends so much on the audit risk involved as discovered by the auditor when he evaluates the internal control system. The person of the auditor however is very important. His knowledge and qualification will determine his ability to deliver. When he can make use of Data Analytic, it will add to the quality of the work done because, accounting firms have stated that big data is becoming an increasingly important aspect of their assurance process since it aids in the detection and prevention of fraud, (Ida, Razana, Nurul, Sayed & Ayatulloh 2022). The work of an auditor is very important as people will always depend on it for decision making. This is demonstrated in Livestock Feeds Plc vs Farms Ltd (2002), where the court held that the audited statement of account of a company is the best way of showing the financial position of the company at any given time.

According to Alles and Gray (2016), accounting firms have been comfortable operating for many years by analysing samples of accounting data and completing standard audit procedures using traditional auditing techniques. However, currently, both practitioners and academics have emphasized the use of analytics in the auditing area (Kend & Nguyen, 2020)

Theoretical Framework

This work is linked to Diffusion of Innovations theory.

Diffusion of innovations is a theory introduced by Everett Rogers in 1962 that seeks to explain how, why, and at what rate new ideas and technology spread. Rogers (2003) views innovation adoption as a decision of206Asia-Pacific Management Accounting Journal, Volume 18 Issue 3 full use of an innovation as the best course of action available and rejection is a decision not to adopt an innovation. Rogers defined diffusion as the process in which an innovation is communicated through certain channels over time among the members of a social system. This is only saying that Data Analytics in accounting is an innovation and would be accepted in due course.

Data Analytic in Auditing

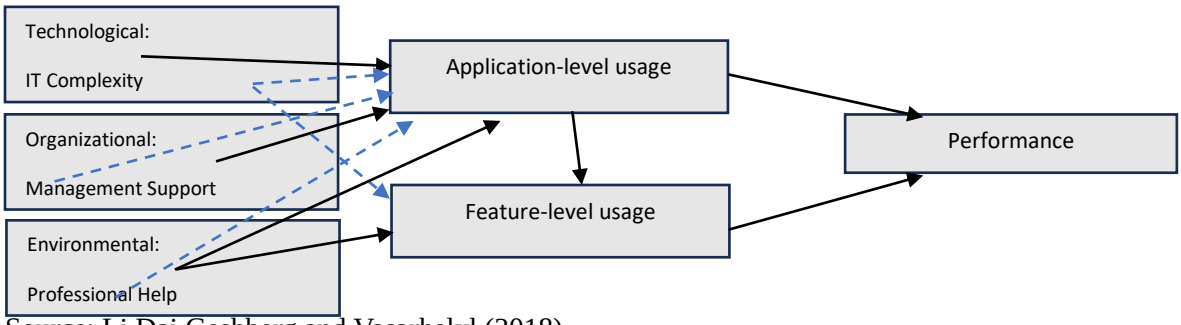
Ida, et al (2022), believes that any company that lags behind in development of data analytics capabilities and innovation is likely to fall behind the competition and suffer severe financial consequences.

Technological, organizational, and environmental (TOE) framework

Li, Dai, Geshberg, and Vasarhelyi (2018) introduced the conceptual model of audit analytics usage and value based on the technological, organizational, and environmental (TOE) framework, as one of the ways auditors could use data analytics in audit work to detect and prevent fraud. The three aspects of the TOE framework are technological, organizational, and environmental. The technological element includes descriptive measures about the organization such as size or management attitude, as well as the organizational element, which includes descriptive measures about the organization such as size or management attitude, while the environmental element describes the environment in which a firm conducts business, including industry, competitors, and government relationships.

By adding the environmental context, which presents both limits and possibilities for technological adoption, the TOE framework (see Figure 1) gives more explanatory power. The left side of the framework depicts the antecedents of audit analytics use, such as factors that influence audit analytics use, while the right side of the model focuses on the performance and improvement of the internal audit process as a result of the technology's use. The application-level and feature-level usage of audit analytics can be separated. The extent to which auditors use audit analytics software in the audit process to detect and prevent fraud in a business is referred to as the application level of audit analytics utilization. When software that supports audit analytics is utilized often in the majority of audit processes, for example, application-level audit analytics utilization is deemed high.

Figure 1: TOE framework



Source: Li Dai Geshberg and Vasarhelyl (2018)

Feature-level audit analytics utilization, on the other hand, is a composite measure that takes into account specific audit analytics methodologies as well as software features like summarization and regression, as well as the frequency with which they are used. It takes into account the number of different audit analytics techniques employed as well as the complexity of such approaches. To achieve a high degree of feature-level audit analytics usage, firm auditors must be familiar with both basic and advanced methodologies, as well as their strengths and shortcomings. Auditors should also be able to use the most efficient ones to complete various audit jobs. It is conceivable for a company to increase application-level utilization while keeping feature-level consumption low. Auditors, for example, may routinely use basic audit analytics during the audit process but lack the knowledge and experience to apply more complex techniques. Furthermore, it is hypothesized that technological competence, IT complexity, firm size, management support, standards, and expert assistance will all have an impact on audit analytics utilization at the application level. Furthermore, feature-level utilization is positively influenced by application-level usage, expert assistance, and technological proficiency. Internal audit performance is improved by using audit analytics at both the application and feature levels, indicating that technological competence, management support, and standards are positively associated with application-level audit analytics usage, while application-level usage, professional help, and technological competence have positive impacts on feature-level usage. The audit process is improved by using both the application and the features.

METHODOLOGY

The Library Search method was used in this research involving journals, textbooks, web search like Wikipedia and any other Pdf articles on data analytics and auditing the financial statement of companies.

DISCOVERIES

The discoveries made shows that there are some prospects as well as problems in integrating Data Analytics into audit practice. The underlying prospects include:

Data Mining Process

One of the benefits in integrating data analytics into audit process is data mining process. This is one of the most important aspects of database system and the most exciting and promising development in the information sector as declared by Cardoni, Kiseleva, and De Luca, 2020; Banarescu, 2015. It is frequently used for evaluating data patterns when trying to detect fraud (Mohammadi, Yazdani, KhanMohammadi, and Mahan, 2020).

Data Mining method is an analytical tool that is used to examine data and extract information from data set in order to uncover patterns and relationship, as asserted by Ida et al, 2022. Data mining is like trying to excavate mineral resources from the ground which would be put into various uses.

Ability to Assist in Strategic Decision

With Predictive Analytics, Models that forecast future events can be created by the auditor

Auditors can now perform a hundred percent check no longer sampling. Greater number of transactions can now be examined without much time wasted when compared to the work done. Interesting as this may be, it is not without problems. Problems in Data Analytics include the following:

Limited Knowledge of Software

When an auditor fails to acquire the necessary knowledge, he cannot perform audit with data analytics to enjoy the benefits therein.

RECOMMENDATIONS AND CONCLUSION

The researcher taken notes of the discoveries recommend as follows that accounting firms should train their staff on data analytics tools and techniques. Any accounting firm which lacks knowledge of Data Analytics can seek the service of professional company. She also recommends the inculcation the study of Data Analytics into the school curriculum as part of the course work of accountants in the making. Finally, more research work in this area of study is recommended.

REFERENCES

Alles, M., & Gray, G. L. (2016). Incorporating big data in audits: Identifying inhibitors and a research agenda to address those inhibitors. *International Journal of Accounting Information System*, 22, 44–59. https://doi.org/10.1016/j.accinf.2016.07.004

Banarescu, A. (2015). Detecting and preventing fraud with data analytics. Procedia *Economics and Finance*, 32,1827–1836. https://doi.org/10.1016/S2212-5671(15)01485-9

Cardoni, A., Kiseleva, E., & De Luca, F. (2020). Continuous auditing and data mining for strategic risk control and anticorruption: Creating ―fair‖ value in the digital age. Business Strategy and the Environment, 29(8), 3072–3085. https://doi.org/10.1002/bse.2558

Chaurasia, S. S., & Rosin, A. F. (2017). From big data to big impact: Analytics for teaching and learning in higher education. Industrial and Commercial Training, 49(7), 321-328

Durtschi, C. & Wang, T., (2020). The Development of Accounting Data Analytics Curriculum, *International Journal of Computer Auditing* , 2(1), 1- 4.

Gamage, P. (2016). Big Data: are accounting educators ready? *Journal of Accounting and Management Information Systems*, 15(3), 588-604.

Ida R., Razana J., Nurul A., Sayed A., Ayatulloh M., (2022). Detecting and preventing fraud With big data analytics: auditing perspective. *Journal of Governance and Regulation* / 11(4)

Kend, M., & Nguyen, L. A. (2020). Big data analytics and other emerging technologies: The impact On the Australian audit and assurance profession. *Australian Accounting Review,* 30(4), 269-282. https://doi.org/10.1111/auar.12305

Li, H., Dai, J., Geshberg, T., & Vasarhelyi, M. A. (2018). Understanding usage and value of audit analytics for internal auditors: An organizational approach. *International Journal of Accounting Information Systems*, 28, 59–76. https://doi.org/10.1016/j.accinf.2017.12.005

Mohammadi, M., Yazdani, S., Khanmohammadi, M., & Maham, K. (2020). Financial reporting fraud detection: An analysis of data mining algorithms. *International Journal of Finance and Managerial Accounting*, 4(16), 1–12. Retrieved from https://cutt.ly/2KMpfRh

Nur I., Eley S., Norlaila M. & Surtikanti S., 2023. Exploring the Diffusion of Big Data Analytics within Accounting Education. Asia-Pacific Management Accounting Journal, 18(3).