THE USE OF EXTERNAL AUDITOR TO DATA MINING AS AN ARTIFICIAL INTELLIGENCE TECHNOLOGY TO EXAMINE THE INTERNAL CONTROL SYSTEMS IN AN ELECTRONIC BUSINESS ENVIRONMENT

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ABSTRACT

This research clarified the importance of the external auditor's use of one of the modern tools of artificial intelligence applications in the audit process, i.e., data mining technology in the electronic business environment. Therefore, this research gauged the contribution of artificial intelligence applications in diagnosing the strengths and weaknesses of electronic control systems in an electronic business environment. It also investigated the contribution of artificial intelligence to external auditor in reducing auditing risks. The study reached that: artificial intelligent applications can be used in various fields, including in They enjoy a number of advantages that increase the need for them. Accounting and auditing Furthermore, they contribute to developing the role with the development of technology auditors and improving the quality of their performance. External auditor employs artificial intelligence with data mining technology to provide a new mechanism that will improve and Finally, it is recommended to include artificial intelligent in the achieve audit objectives curricula and that the external auditor's report should contain a paragraph which states the extent and type of modern technology used in the audit.

KEYWORDS: Artificial Intelligence, Data Mining, Electronic Internal Control Systems, External Auditor

Introduction

The tremendous electronic progress and the indulging of modern applications in various fields has urged many specialists in the field of accounting and auditing to employ modern technology and make use of its advantages to overcome the obstacles and problems they face when they use traditional methods. These specialists also try to overcome any obstacles that prevent them to achieve their goals within the electronic business environment. Designing internal control systems is one of the most difficult tasks in the work of companies. It prompts specialists to design internal control systems applicable to the electronic business environment and consistent with the size and activity of the company and reduce errors and manipulation. Such system is referred into as electronic internal control systems. Furthermore, auditors try to discover errors and set an opinion on the financial statements and their financial position, based on their experiences and the application of generally accepted auditing standards. However, these procedures alone are not sufficient. Such issue requires auditors to rely on modern technological means and tools in conjunction with traditional means of auditing. This research provides a vision that is consistent with such hybrid role. It links

between how to design systems for electronic internal control in the electronic business environment that has strength and can be relied upon, the role of the external auditor in examining those systems, and role of an auditors to express their opinion on such systems. Thus, auditors use of an artificial intelligence application in the field of auditing; they may rely on the advantages of data mining technology.

Research problem

Audit risks increase with the increasing use of technology by various companies and the application of electronic systems. Thus, external auditors are required to make greater efforts to achieve audit objectives and face those risks. This research tries to answer the following questions:

1 Do artificial intelligence applications participate in diagnosing the strengths and weaknesses of electronic control systems in electronic business environment?

2 Do artificial intelligence applications assist external auditor in reducing audit risks?

Research Hypothesis

It is hypothesized that:

There is a relationship between the use of the external auditor for artificial intelligence applications and the use of data mining technology and the auditor's examination of the internal control system in the electronic business environment.

Research Objectives

This research aims to:

1- Recognizing the advantages of artificial intelligence applications in the field of auditing.

2- Getting familiarity with the data mining technology, its advantages and the possibility of employing it by the external auditor.

3- The possibility of integrating the characteristics of artificial intelligence and data mining in examining internal control systems in the electronic business environment.

Research Importance

This research got its importance by activating the role of the external auditor using modern technologies such as artificial intelligence and data mining in examining internal control systems, especially in the electronic business environment. Furthermore, the significance of this research lies in its identifying the strengths and weaknesses in them, in addition to judging whether such technology can be relied upon or not, upgrading this role and achieving audit objectives.

Literature Review

Artificial Intelligence

Artificial intelligence (AI) is defined as the ability to learn, understand, solve problems and make decisions (Negnevitsky, 2004). AI is also one of the applications of computer science that is concerned with building programs capable of performing tasks and duties that intelligent people are required to do (Al-Dahrawi & Muhammad). AI is also defined as the smart actions that the machine provides by imitating human behavior (Kwafo, 2019); it is also one of the computer applications that is concerned with building programs capable of carrying out repetitive activities that humans are accustomed to do (Anbar, 2015) Likewise, other scholar defined AI as a part of computer science that aims to design intelligent systems characterized by some of human behavior (Osman & Jamil, 2015). AI can be defined as smart systems operated via a computer; they simulate the human mind in understanding, analysis and decision-making. Due to the absence of an agreed upon definition, Vinuesa, et al. (2020) viewed AI as any technology that has one of the following characteristics:

1. Perception
2. Make decisions
3. Prediction
4. Automatically extract and elicit knowledge
5. Interactive communication
6. Think logically
7. Machine learning

The Advantages of Artificial Intelligence

There are a number of advantages of AI that can be utilized in the field of accounting and auditing. The Institute of Charted Accounting in England and Wales (ICAEW) has indicated those advantages as follows (ICAEW, 2018):

1. Supporting decision-making by providing better and less costly data.
2. Providing a more detailed analysis of the data.
3. Focusing on the most valuable tasks after saving time.

Some studies have found that the application of AI on accounting positively affects the performance of accounting jobs. Smart accounting systems will take over more tasks on behalf of accountants. The present time is considered the right time to re-engineer smart accounting systems, and an important opportunity for accounting to become more important (Odoh et al., 2018). Likely, AI will change the traditional way of accounting jobs; the applications AI in accounting information systems lead to the delivery of a large amount of accounting work will be deliver to the computer to process and complete them. Smart applications issue bills, prepare budget, complete procedures

and treatments automatically, especially those tasks of a routine nature that take a long time. Moreover, smart applications provide from the possibility of avoiding fraud. Still these applications cannot be tempted with money or the use of force, and they can prevent, detect, predict and determine Fraudulent activities are easily done by machine learning.

Artificial intelligent applications (AIAs) contribute to the quality of information systems output, represented by accounting information. It reduces effort, fatigue and errors, preserves material resources and increases work efficiency. The implementation of AIAs in some work will lead to the completion of all accounting and financial treatments and procedures in a timely manner (Gusai, 2019). AIAs can also contribute to enhancing the role of the external auditors to carry out their tasks and objectives. AI helps reduce audit risks which are related to expressing an incorrect opinion or failing to detect fundamental errors in the internal control system. AI also qualifies the external auditor to reach the highest levels of assurance in less time and effort; it also gives more time to aspects that cannot be achieved using machines. AL enables the auditors to focus their attention on risky areas that require experience and judgment.

AIAs also contribute to a complete examination of the statistical community. Auditors always rely on samples during the process of the difficulty of conducting a full examination of information and documents manually, which leads to the so-called sampling risks resulting from the sample not representing the statistical community, and then arriving at a wrong opinion Inaccurate decisions and then making incorrect decisions, as happens in the evaluation of the internal control system as being appropriate and strong, while it contains material weaknesses that were not revealed through the use of samples (Al-Samarrai & Sharida, 2020). We note that there are a number of advantages and benefits achieved from the applications of AI in the field of accounting and auditing. The use of AI will be positively reflected in increasing trust in the financial statements of companies.

Data Mining

The scientific advance and the great technological development that took place in the field of information systems and the huge amount of information and the accumulation of the huge amount of daily stored data. They showed urgent needs for new technologies and smart tools that can help convert this huge amount of data into useful information, which is assembled by tools of data mining. Data mining process uses artificial mathematical intelligence and machine learning techniques to extract and identify useful information. It then obtains knowledge from a large database. Data mining is perceived as an analytical technique that helps auditors in decision-making and detection of fraud cases (Sharma & Panigahi, 2012). Data mining aims to disclose hidden information in large data blocks. The term data mining refers to the data mining operations in large amounts of data. It originally aims to discover the hidden knowledge in them. It is a very process similar to the process of mining precious metals (MDRSC, 2022).

Data mining process passes through a number of stages; they are:

Business understanding: It is the core element for the success of the data mining process, where it is necessary to know what the business under study and the general needs required to access knowledge regarding the nature of the work and the desired goals and expected benefits.

Understanding data: It is the first stage of data mining; it begins by defining the relationships between the available data from various databases and the description of a work task. Therefore, when selecting the data, it is necessary to prepare a brief and clear description of the problem, and to specify what the required data are for describing the problem.

Data preparation: The goal of this stage is to ensure that the data are ready for exploration, and the process of data selection includes (deciding on relevant data), data cleansing, data integration (compiling data from multiple sources into a standardized format), and data transformation and simplification (removing redundancy and merging the data into an aggregate form).

Modeling: In this stage, a set of data mining methods are applied to the previously processed data set in order to build a model that describes the data set. Modeling includes choosing a data mining method, model design, model building, model selection, and model validation and evaluation.

The evaluation process includes the use of a set of criteria to evaluate the exploration outcome. It includes the accuracy and speed of the model, the actual costs, the degree of automation, its development, reviewing processes, and determining the next steps at the end of the stage until the approval of a model that can be applied. The implementation stage begins with preparing a plan for the actual application. Likewise, a plan is drawn up to develop each of the follow-up and maintenance processes and evaluate the success of the achievement (Hamad, 2012).

Data warehouses

It integrates a set of historical permanent data that help in making administrative decisions to assist in accessing data for the purposes of time analyzes, knowledge discovery and decision- making. Data warehouses are specially designed to extract and purify data, process and present them in a form suitable for this purpose. Data warehouses include huge amounts of data collected from different sources, rules, systems and places. Data warehouses are characterized by:

- They use a multidimensional model.
- They support time series, trend analysis, and the need for historical data that conventional databases cannot provide.
- They update data at intervals of time.
- They retrieve and analysis data for undefined aggregation levels and dimensions.
- They support the main server architecture and multi-users
- They keep a large amount of data, which may reach several terabytes.
- They are specific and topic-oriented.
- They are integrated and construct a relationship between the data.

- They are adjustable.
- Data stored in warehouses are limited to analysis, study and presentation.

Building data warehouses requires the following steps:

- Creating an introductory space for data.
- Building a data warehouse.
- Segmenting the data warehouse into a group of data stores.
- Extracting, purifying and transferring data.
- Loading the data into the data warehouse.
- Analyzing data and creating applications for decision support systems.
- Storage in a data warehouse (Han & Kamber, 2006).

Online analytical processing

It is defined as a method for quickly producing a set of multi-dimensional analytical queries. Its applications include preparing various financial and administrative reports, preparing budgets and forecasts (Hamad, 2012).

Electronic internal control system

It is the use of modern electronic methods and means to monitor activities and transactions within the organization in order to achieve economy in effort, time and cost to reach the desired results with the least possible risks (Kruchko et al., 1996).

The use of the computer has led to the multiplicity of means and influence used in the internal control system. It has impacted the approach that the internal control pursued. Computer also led to the emergence of new elements of this system and an increase in its importance. Likely, computer has affected the criteria used to identify the internal controls. Using computer led to a difference in the nature of audit problems in internal control system from the nature of the problems caused by the use of the manual system (Othman, 1999).

The characteristics of electronic internal control

Qail et al. (2004) list the most important characteristics of electronic internal control:

1. The electronic internal monitoring can limit surprises, identify deviations at the time of their occurrence and give alerts electronically through the control programs used without the need for human intervention.
2. Electronic monitoring provides an effective use of information systems; it also provides an information base about the performance and activities of the executive bodies to be ready when the higher management needs to take a specific decision.
3. Electronic monitoring is an essential element for creating work systems that focus on the aspects affecting the performance of the executive bodies in the organization. Such aspects are crucial in determining the failure and success of the organization.
4. Electronic monitoring activates the issue of transparency for the executive bodies, which led to the clarity of those bodies activities to the controlling bodies.

Objectives of the electronic internal control system

The electronic internal control system aims to achieve the following goals:

1. Economy: An auditor uses the computer as much as possible to serve the company at the lowest costs, while providing the required information and data in a timely manner.
2. Effectiveness: It is the auditor's examination of the effectiveness of the control tools to ensure the efficiency of the internal control system and in all administrative, operational and financial activities
3. Efficiency: Checking the use of the computer to meet the most important requirements for the company and according to the concept of materiality.
4. Protection: The auditor ensured that the system was protected from various types of risks such as system crash, data loss, robbery, vandalism and viruses.

Specifications of a good internal control system

Abdullah (2004) identified that good electronic internal control system can be achieved through the following

1. Systems design and analysis.
2. Establishing policies and instructions that determine access to the computer room, the places where records are stored, and the means by which information is stored.
3. Issuing regulations that determine only those who are authorized to enter and change data in the computer.
4. Issuing policies for periodic examination of some computer operations, which must be carried out by individuals who are not belonging to the computer department; they may be employees affiliated to the internal audit unit.

Electronic business environment reflection on internal control systems

Large companies are increasingly relying on the application of the electronic business environment every day in order to manage their business and activities in an appropriate manner and time. Therefore, the traditional monitoring process may not be feasible for companies that use the electronic business environment because this requires continuity of control over the accounting systems applied in the company. Continuous monitoring requires to come up with the new developments in information technology that affect the company's activity. Likewise, the controlling continuation in light of the electronic business environment requires the job isolations between employees in order to identify defects in a timely manner and follow up on compliance with security and privacy policies. It is also to modify them in line with electronic

threats and technology information, and ensure continuity of control over the following (Baccasam, 2003).

1 Monitoring user's work or activity.

2 Monitoring of the company's business and activities.

3 Monitoring of applications.

A proposed mechanism for using artificial intelligence in examining electronic control systems using data mining technology

This section presents a vision for a proposed mechanism for employing artificial intelligence applications and taking advantage of the characteristics of data mining technology that the external auditor may use in examining electronic control systems in electronic business environment:

Firstly: An AI application is chosen to suit the task of examining electronic internal control systems in the electronic business environment. There are a number of smart applications that can be used in this task.

Second: Preparing the survey forms in which the internal control system will be examined. It is based on the audit guide No. (4) issued by the Accounting Standards Oversight Council in Iraq. The surveys contained in this guide are comprehensive and cover all aspects of the company's activities and are approved in various Iraqi organizations. They will be converted electronically for the purpose of operating electronically by AI and data mining technology, and these surveys include the following:

Survey List 1. (Money)

No	Questions	Yes	No
1	Is the task of the cashier or supervisor of cash independent from registering in the records, preparing sales lists, and preparing checks?		
2	Do you use an iron closet cash to save money?		
3	Is there a record used to control unused receivable receipts?		
4	Are receipts kept with a responsible employee other than the cashier?		
5	Does a specialized committee check the receipts for printing and receiving them?		
6	Is there an upper limit for keeping cash in the fund?		
7	Is the closet cash used to save other amounts such as salaries and petty cash advances?		
8	Does someone else other than the cashier receive the incoming checks?		
9	Is a statement of incoming checks prepared and a copy is given to the financial accounts?		
10	Does the cashier keep a record of cash receipts and expenditures?		
11	Is the record of receipts compared daily with the cash holdings?		
12	Does the internal audit perform a periodic and sudden audit?		
13	Is there a periodic matching between the cashier's record of the and the general ledger?		
14	Does the cashier deposit the money on a daily basis or wait till the		

	amount reaches a certain limit?		
15	In the case of branches, do you deposit funds into non-drawable accounts?		
16	Are there instructions that prevent receipts from being used to pay wages in cash or personal checks?		
17	Do you use the crossed check method for mailed checks?		
18	Are unemployment checks kept?		
19	Is the matching of bank statement performed by a third party who has nothing to do with analyzing the bank account or preparing and signing checks?		
20	Is the checking account monitored for collection periodically?		
21	Are the deposit slips stamped by the bank checked with the fund's diary record?		

Survey List 2. (Electronic Accounting)

No	Questions	Yes	No
1	Does the job of program setting separate from the operating job?		
2	Is the job of keeping files and records assigned to a librarian?		
3	Is there a monitoring over: 1. Input? 2. Correct mistakes? 3. Outputs?		
4	Are there adequate procedures in place to protect files, records, and devices from damage and tampering?		
5	Are copies of files and records kept in a safe place outside the calculator location?		
6	Are the components of the master file subject to periodic auditing?		
7	Is the program modification done with the approval of the senior management?		
8	Do the management of the accounting have instructions to ensure good performance, such as instructions for operating the device, and instruction for the approval system for software modification?		
9	Is there a monitoring over the distribution of outputs to the specialized departments?		

Survey Checklist 3 (Stored Material Inventory)

No	Questions	Yes	No
1	Is there a special department for warehouse accounts?		
2	Is each store in the custody of a responsible storekeeper?		
3	Are the storekeepers specialized in warehouse work?		
4	Are the store cards kept by the storekeeper?		
5	Are the stored goods received by a special committee for receiving and examination?		
6	Is a warehouse receipt or disbursement document organized for each transaction? Is it immediately happened upon the occurrence of the transaction?		
7	Is the exchange from the stores not taking place until:		

	- Submitting a request from the relevant department? - Attestation of the warehouse manager or the person in charge?		
8	Is there a special section for warehouse accounts?		
9	Is there a periodic matching between the item cards in the stores and the cards of the warehouse accounts department?		
10	Do the records of the warehouse accounts include all the stores of the establishment?		
11	Does the management of warehouse prepare reports on: - Stock materials? - Damaged materials? - Materials that meet the demand?		
12	Is there a system to write off damaged/expired materials?		
13	Are all stored materials inventoried?		
14	Do the participants in the inventory have nothing to do with the inventory holding and inventory records?		
15	Are there clear instructions for the inventory process?		
16	Are all stored materials priced?		
17	Are used and old materials separated and not stored with new materials?		
18	Are the inventories audited by the internal audit?		
19	Are there adequate protections for stored materials?		
20	Are the stored materials arranged in an easy way to count and inventory?		
21	Are copies of the warehouse outgoing document distributed to the relevant departments?		

Survey Checklist 4 (Administrative Monitoring)

No	Questions	Yes	No
1	Are there specific objectives for the facility?		
2	Have clear policies been set to determine the facility goals?		
3	Has an organizational structure been set and vertical and horizontal lines of communication been defined?		
4	Have written administrative orders which determine the duties of the facility's employees been prepared?		
5	Is there a system for evaluating the performance of employees?		
6	Is there a detailed description for each job?		
7	Is there a system determining standing committees?		
8	Are the duties of employees constantly changing?		
9	Is the department of internal audit linked to senior management?		
10	Does the audit program include all the facility activities?		
11	Have reports on activities been prepared for senior management?		
12	Were the previous and subsequent charges audited for?		
13	Does the facility keep a record of employees?		
14	Are personal files kept for employees?		
15	Are reports prepared on the work circulation in the facility?		
16	Are the bonuses and promotions linked to the incentive system and the employee evaluation system?		

17	Is there a determination of the cadres of work?		

Survey Checklist 5 (Commodity and Service Requirements)

No	Questions	Yes	No
1	Are the spent materials for the departments subjected to the monitoring of the department heads?		
2	Is there a monitoring to ensure that the spent materials were used for the purposes which they were spent for?		
3	Is periodic check carried out to match the quantities actually used and the standard quantities of the final products?		
4	Is the production residues controlled?		
5	Is there a description of the raw materials needed for production?		
6	Is there a follow-up to investigate the damaged materials?		
7	Are there materials requests studied?		
8	Is the request for materials based on a planning budget?		
9	Are approvals obtained in the event of additional requests?		
10	Does the facility use the contract system to obtain services of continuous need?		
11	Does the facility use accurate means and procedures to determine the company's share of joint expenses and services?		
12	Is there monitoring to ensure that the amounts spent for service requirements are for services actually performed?		
13	Are records kept to control maintenance expenses?		
14	Is there a maintenance plan?		

Survey Checklist 5 (Commodity and Service Requirements)

No	Questions	Yes	No
1	Does the employee responsible for maintaining the clients' account have no relationship with: Fund Secretariat? Sending and receiving statements of customers and suppliers? Aged debt analysis? Adoption of bad debts? Adoption of discounts and allowances?		
2	Are records kept to control accounts receivable?		
3	Are these records being matched monthly?		
4	Are periodic statements sent to customers and suppliers?		
5	Are ledger holders changed periodically?		
6	Is writing off debts by senior management?		
7	Is there a special employee to follow up on debt collection?		
8	Is dealing with customers who present bad checks suspended?		

At this stage, data mining is used. The crisp-industry standard process for data mining (CRISP- DM) process is used. It is pertained in many commercial and applied fields. it includes the following steps:

Business Understanding: The analyst spends time to comprehend the motivations of a data mining project from a business perspective.

Understanding the Data: In this step, the analyst gets familiar with the data, their advantages and disadvantages, and makes hypotheses.

Data Preparation: This step contains the identification, integration, transformation, and preprocessing steps that are included in the other models as separate steps.

Modeling: Algorithms are applied on the data to discover patterns. The analyst's task is to re- evaluate the preparation of the data in the previous step.

Evaluation: assessing the value of the discovered models and patterns in answering the questions asked.

Publication or Presentation: Presenting the discovered knowledge and models to solve the presented problems.

An advantage of CRISP-DM has an advantage as it involves the repetition of certain steps; the analyst will verify that the current step is still compatible with some previous steps, and also clearly remind analysts to put business issues at the heart of the project even in the evaluation step.

The above processes show that the data required in the survey forms can be filtered from the company's database, which contains large and diverse data, and prepared in a way that the external auditor can, through the smart application, examine the company's internal control system. It also judges the strength and suitability by checking the availability of the elements mentioned in the survey. Therefore, data mining and AI technology will be employed to develop the role of the external auditor in judging the company's electronic internal control system in the electronic business environment. They will save effort and time as well as assure accuracy, and achieve the objectives and quality of the audit.

Conclusions

1. AIAs are among the applications that can be used in various fields, including in accounting and auditing.
2. AIAs enjoy a number of advantages that increase the need for them with the development of technology.
3. AIAs can contribute to developing the role of the auditors and improving the quality of their performance. Such development is reflected in the content of the reports that the auditors submitted.
4. Data mining technology can also be used in accounting and auditing, especially in the electronic business environment. DM can be applied in settings with increasing complexity of companies' activities and the big size of data.

5. The external auditor employs of AI with data mining technology can provide a new mechanism that will improve and achieve audit objectives.

Recommendations

1. Teaching AI in details in the curricula of accounting and auditing.
2. Conducting specialized courses in AI and data mining for those working in the field of auditing.
3. Professional organizations issue periodic publications and research in AI.
4. Considering the use of technology and AIAs by audit companies as one of the elements of quality assurance.
5. Including in the external auditor's report to a paragraph regarding the extent and type of modern technology used in the audit.

REFERENCES

Abdullah, K. A. (2004). *The scientific aspect of auditing, (2nd edition)*, Amman: Wael Publishing House. Accounting Standards Oversight Council in Iraq in. *Audit Guide* No. (4).

Al-Dahrawi, K. & Muhammad, S. (2000). *Accounting information systems, (1st edition).* New University House.

Al-Samarrai, I. & Sherida, N. (2020). The role of artificial intelligence techniques using digital auditing in achieving audit quality and supporting its strategy from the point of view of auditors: A field study in audit firms in the Kingdom of Bahrain. *International Journal of Economics and Business,* 8(1), Pp 15-31

Anbar, S. (2015). *The quality of auditing by adopting artificial intelligence,* (Unpublished PhD Thesis). University of Baghdad.

Baccasam, V. P. (2003). Continuous monitoring of application risk. IIA, 6.

Gail, L., Nancy., Sukanq a, P." *Regulatious of electronic employee monitoring: Identifying fundawental principles of employee privacy legislation in the Europeen Union, U.S and Canada,* Standford Technology Law Review, 2004.

Gusai, O. P. (2019). Robot human interaction: Role of artificial intelligence in accounting and auditing. Indian Journal of Accounting, 51(1), 59-62.

Hamad, M. N. (2012). *The impactful role of using artificial intelligence applications in improving the credibility of accounting information for effective decision-making*. 11th Annual Scientific Conference, Business Intelligence and Knowledge Economy, Al-Zaytoka University of Jordan.

Han, J. & Kamber, M. (2006). *Data mining: concepts and techniques, (2nd edition)*. University of Illinois at Urbana Champaign: Morgan Kaufmann.

Kruchko, J. G., Fries, J., Lusky, P. M., Ray, S. W., Talty, K. A., Isler, E. L., & Law, C. A. (1996). *Monitoring your employees: how much can you do and what should you do when you uncover wrongdoing.* In 19th National Security Conference.

Kwafo, D. (2019). *The impacts of artificial intelligence on Management accounting students:* A case study at Oulu business school. university of Oula, (Unpublished master thesis). University of Oula

MDRSC, (2022). *Introduction to data mining.* Retrieved from www.mdrscenter.com.

Negnevitsky, M. (2004). *Artificial intelligence: a guide of intelligent systems.* Riyadh: Mars Publishing House.

Odoh, L., Echefu, S., Ugwuanyi, U. & Chukwuani, N. (2018). Effect of artificial intelligence on the performance of accounting operations among accounting firms in South East Nigeria. *Asian Journal of Economics, Business and Accounting,* 7(2), Pp 1-11.

Osman, O. & Jamil, A. (2015). The possibility of using artificial intelligence techniques in controlling the quality of internal audit: A field study in Jordanian public shareholding companies. *Journal of the University of Jordan,* Pp 239-252.

Othman, A. (1999). *The principles of audit and internal control, (1st Edition)*. Mosul: Dar Al-Kitab for Printing and Publishing.

Sharma, A. & Panigahi, P. (2012). Review of financial accounting fraud detection based on data mining techniques. *International Journal of Computer Applications*, 39(1), Pp 38-39.

Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V. & Nerini, F. (2020). The role of artificial intelligence in achieving the Sustainable Development Goals. *Nat Commun*, 11(1), Pp 233-248.