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Impact of Technology on Auditing: Evidence in Developing Countries

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Abstract

Developing countries face unique challenges in ensuring good governance and effective use of resources, which necessitates technology for auditing as traditional methods struggle to address them adequately. Auditor shortages and funding constraints make it difficult to effectively cover public and private entities; hence, most developing countries' technology adoption is still in its infancy. In recent years, public entities and private organizations are increasingly using digital systems for financial transactions, creating a vast amount of electronic data that requires real-time monitoring. Technology has made companies focus on internal auditing to evaluate the effectiveness of internal controls in influencing performance and detecting errors. Internal auditing systems root out irregularities leading to poor decisions and enable companies to achieve their goals, and technology has made the process fast and reliable. Auditors can analyze huge volumes of structured and unstructured data in the company while accessing 100% of user data to eliminate fraud and inconsistencies. Internal audit is considered an important factor in business because it enables the business to stay on course by reporting the company's financial performance. The purpose of this paper is to examine how Malaysia adopted technology and revolutionized internal auditing.

Keywords: Internal Audit, Developing Countries, Technology, Fraud, Digital Systems.

Introduction

Technology is operating changes in our lives that how we work, interact and live and audit profession. the audit profession is now changing by technology, but it is keeping pace with these changes. Using technology today enhances auditing and enables auditors to analyze large data related company's financial information fastly, and auditors avoid error risks. Day by day technology is getting more advanced and it gives way to auditors to visualize and analyze financial data in a better way. Today, different companies are collaborating with technologies on audits. So, this research paper explains the use of information technology in audit in different developing countries and the challenges and risks facing auditing. Developing countries adopt technology for audit, but it is still late in the audit. IT auditing in Botswana is still at its infancy stage. (Nkwe, 2011, p. 126). So, developing country still looking for ways to improve the adoption of technology auditing not only for the industry but also academically, there is not enough research on the area of IT Auditing. This research paper presented Malaysia as an example of a developing country that has adopted technology and is somewhat advanced and how other countries adopt their strategies for using technology in the audit. In addition, challenges and risks facing developing countries to adopt the technology, and the plan to overcome these challenges.

The Evolving of Technology in Auditing

Today is the fourth industrial revolution by entering a group of new technologies like artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3D printing, and nanotechnology. The leadership of accounting adopted technology in auditing that will change auditing in the future. Using new technology will enhance auditing and can enable auditors to analyze a large volume of structured and unstructured data related to a company's financial information which are more manual and rote. Also, the new tools will help auditors to do advanced analytics that

reflects higher awareness and more profound insights into the operations system. Also, auditors can decide and evaluate through auditing process, by track and analyze their client's trends and risks against an industry. Auditors can develop predictive indicators which lead to early identification of fraud and operational risks and forecast financial distress and assess the future financial viability for the company through the power of big data offered by technology. Some predict that the audit of the future will be able to provide a higher level of assurance than today's level of "reasonable assurance" as auditors may be able to examine 100 percent of a client's transactions. Others predict that the ability of the auditor to access client data in a timelier, standardized format, may result in auditors moving towards a more continuous auditing and monitoring approach (Harris, 2017). However, there are some factors that should company consider for example, the data should be reliable and complete and accurate, data security and quality control over these tools. Auditors should use tools to provide additional insight to management about their operations and processes rather than to improve audit quality and investor protection.

The Impact of Technology on the Internal Auditing

With the technology revolution, there is an increasing focus on internal auditing. Internal audit is essential to evaluate the effectiveness of internal control to display accurate information by collecting information related to implementation and performance to determine errors or inefficiencies. Internal audit goals are to identify a control system to prevent irregularities that lead to poor decision-making and support the organization in achieving its goals by a systematic approach to assess the effectiveness of risk, control, and governance. Internal audit is considered an important factor in business because it reports on financial performance, It is an independent activity designed to maintain the firm's assets and help in providing reliable accounting information predict risks and provide financial consulting and translation of financial information for decision-making purposes. The successful

internal audit depends on the logical analysis and evaluation of data, but there are some factors impact on internal audit credibility (Alkebsi & Azman Aziz, 2017). There are also some factors that influence the effectiveness of internal audits such as internal audit proficiency, work and performance, and audit committee. Regarding internal audit proficiency, technical competence and continuous training are very important and are considered fundamental to effective internal audit.

Due to expanding the use of technology and its impact on the business environment by a decreased period of data processing and the implementation of multiple tasks, most of the international competition, most organizations depend heavily on sophisticated electronic data processing (EDP) systems to manage daily business transactions and strategic accounting records". There are programs that information technology assists internal audit like text processing, spreadsheets, and graphics. The word is used to interned text and processing, and Excel are used to audit functions and allow to users complete the function of business administration and accounting. Word processors are used to intern textual and processing, Spreadsheet software and Excel Smart Tools is used to audit functions and be used to verify the internal consistency of spreadsheets. Also, computer-assisted auditing techniques (CAAT) help auditors to increase productivity besides the auditing function. Can enhance audit efficiency and effectiveness by planning and auditing, reporting, and monitoring. (CAAT) Increases auditing's quality and improves it and helps auditors to accomplish complex and impossible tasks that take a long time if done manually. So, Auditors must develop their technical skills in using audit IT to ensure performed effective audits.

Today, information has become a tool for helping auditors, and most organizations try to keep abreast of technological development and their audit obligations proficiently. Also, the information system will be able to support auditors, with new technology that supports the audit process directly such as file interrogation, and

automated risk analysis. So, the technology impact on the audit will lead to disabling paper use. According to Moorthy et al. (2011, p. 3531), in future years paperless audits will become common where audit clients tend to shift towards paperless systems, and will be depending on audit software for enhancing related auditing procedures. As a result, based on technologies will eliminate the traditional audit and will replace them with electronic data interchange (EDI), image processing, and electronic file transfer (EFT). So, taking methodologies technology available to deal with new information in the system in technology is the primary concern to internal auditors and should they obtain an in-depth understanding of such systems to be able to audit.

Using Information Technology on the Audit in Developing Countries

While most of the organizations in the world have computerized their accounting system, However, for the developing countries was there questioned if their auditor's audit effectively and there is a positive relationship between using CAATs and the quality of reports. So, for knowledge regarding the auditing of computerized accounts in developing countries, the evidence was Nigeria and Botswana.

The big four international audit firms are auditing computerized accounts effectively. Most local companies have a computerized system in Nigeria but ineffective, and they are not sure that if auditors have the resources and skills. So, investors and other users cannot make an important decision by depending significantly on audit reports that were done by local audit firms. After examining samples from auditing firms worked in Nigeria and audit report users and major investors in the stock market found that the quality of auditing is associated with using audit techniques (CAATs) even after controlling by international auditing firms and internal control systems. However, there is a relationship not great between (CAATs) and audit quality in the local audit firms. So, the local audit firms in Nigeria do not produce reports with quality besides being ineffective in CAATs. “local Nigerian firms are not effective

in applying CAATs, and so, do not produce quality audit reports"(Jb & AA, 2015). While most corporations are interested in protecting the public and interested like investors and creditors who consume the audit reports, and keep on the quality of auditing related to auditing firms positively, and training staff on the practical application of CAATs.

Using technology in the audit is a significant area that must be taken a consideration. Developing countries adopt technology for audit, but it is still late in the audit. Auditing firms and the government in Botswana undertake different kinds of audits, like statutory audits, non-statutory audits, external and internal audits, and final audits, performance audits, even though the frequency is dependent on each. In Botswana technology is growing fast and addressed to develop information and communication technology and to improve human resource capacity. However, the technology used in audits is in the first stage. According to (Nkwe, 2011, p. 126), "IT auditing in Botswana is still at its infancy stage. Big auditing firms in Botswana like KPMG, Ernst & Young and Deloitte are still working hard to establish IT auditing departments in their firms".

As you know using technology will lead to traditional audit trails disappear and change the nature of the audit process, and free the auditor from many mundane audit tasks and allow the auditor to use for higher level tasks like understanding the client's business and assessing various risks. So, in Botswana, they still looking for ways to improve the adoption of technology auditing not for the industry, but also academically there is not enough research in the area of IT Auditing in Botswana. Financial auditing has been changing. Botswana is supposed to move in the same direction as other countries and adopt technology auditing. Although there is a mandate to audit corporate finance by independent auditors, there are new rules and regulations that require to review of a computer system, information processing, and other aspects such as corporate governance. Also, ISACA, IIA, AICPA, and similar

organizations document and recommend professional standards for computer and other account auditors.

On the other hand, technology audits in Botswana are new and face challenges such as human capital, education, and who is to do technology on auditing. Also, tertiary institutions do not have a degree level in technology on audits. Technology in auditing is still struggling in Botswana, corporations are reluctant and unconvinced by technology on auditing, and students as well are ambivalent in their opinion about auditing careers. Big firms established some units that are responsible for IT auditing. However, there are no employees that have experience that affected negatively of the technology of auditing growth. Botswana as a developing country needs to adopt IT auditing and invite professional bodies, and the government must play the role to enable the environment for IT auditing.

Malaysia Leveraging Technology to Enhance Audit Quality and Effectiveness

The government of Malaysia has presented the e-government project and increased the allocation for ICT development to reach RM5.17 billion. besides the government adopted a new technology in 1997 to develop infrastructure and systems to improve public service delivery.

NADM who is responsible for audit procedures on all Federal Government Ministries, Departments, and Agencies and the State Governments in Malaysia.

NADM started to adopt technology and start audits in 1980 with audit software ACL and CAAT. From 1996 to 2003 the infrastructure was built, and the computers, network, and software were purchased, so that auditors could audit by using the technology. NADM uses software by CAAT to improve auditing efficiency. In addition, Microsoft Excel and ACL were used in performing data analytics for financial data in performing financial statement auditing.

NADM faced problems with data analytics by applying technology such as system complexities, and data from different sources and platforms. However, NADM started using CAAT in an audit and downloading data from AG office by round tape then a cartridge platform was used to download data. But today because developing IT they download from the client office by Infra Network. In addition, because NADM use ACL's data analysis software to improve government audit processes, and IT team audit analysis of financial data monthly from 23 branches and achieved successful in reaching RM 475 billion. As a result, the NADM was announced as the 16th Impact Award Winner at the ACL Annual Customer Celebration 2014 in Dallas, United States of America (INTOSAI Working Group).

To develop auditors' skills in ICT "NADM conducted in-house training through the National Audit Academy (NAA) for the staff by training by modules to build up ICT competency and expertise in audit work. Hands-on training programs and workshops on IT controls, SDLC, and CAAT are carried out to enhance staff's skills by the School of IT of the NAA. NADM also issued IT Audit Manual and 18 guidelines for auditors.

The Level of Technology in Malaysia

This study introduces the level of information technology adoption by the internal audit unit (IAU) in Malaysia's public sector, and the types of IT applications implemented. IAU who is responsible for audit for financial management and performance audits. 266 questionnaires were collected from heads of the internal auditor in Malaysia. IAU has used technology to manage audits and present results. According to Ahmi et al. (2011, p. 104), IAU has been using computerized applications especially for managing audit works including planning, administrating, reporting and presenting the audit findings. Most of the respondents use Microsoft Office and some of them use Prezi to present audit findings and reports. Around 30% of respondents use CAAT in auditing, specifically ACL for data analysis and reports.

If compared to other applications. Also, the result indicates to IAU their usage for CAAT is low although IAU interested in implementing ACL. However, there is some factors that affect their effort to adopt technology in IAU, for example, the lack of an audit expert in ACL, and the different interests of top management in implementing the technology.

As respondents indicated how often they use technology in each area of auditing. the result was IT has been adopted widely in financial management auditing and performance auditing as compared to other types of auditing. So, it is evident from the study that, IAU level of adopting technology is high, but it is low specifically in auditing.

Table (1): Types of IT adoptions implemented by IAU

Types of IT	Frequency (%)
CAAT	29 (29.6)
IT audits	41 (41.8)
Computerized applications	81 (82.7)
others	3 (3.1)

Table (2): Types of audit software used by IAU

Type of audit software	Frequency (%)
ACL	26 (41.3)
Microsoft access	18 (28.6)
Microsoft excel	7 (11.1)
SPSS	6 (9.5)
Teamate	2 (3.2)
Caseware IDEA	2 (3.2)
TCO stream	1 (1.6)
ESPAK	1 (1.6)
Total	63 (100)

Table (3): Use of IT in specific area in auditing

Type of audit	Never	Rarely	Sometime	Often	Always	Mean
Financial management auditing	29	8	12	29	20	3.03
Performance auditing	34	11	18	18	17	2.72
Information systems auditing	51	3	16	7	21	2.43
Operational auditing	54	11	12	16	14	2.42
Financial statement auditing	85	4	8	12	16	2.22
Investment auditing	74	3	4	10	7	1.70
Other	79	3	7	4	5	1.50

Using of Information Technology in the audit processes by auditors

This study presents information technology usage by auditors at different levels and positions at Malaysian firms.

About 200 questionnaires were distributed to external auditors in Klang Valley. the respondents are auditors at big firms, medium firms, and small firms. For this study, the participants must have at least 6 months of experience in audit firms and identify the technology software that is normally used in their audit processes. and the respondents have to identify the audit procedures which involved information technology and rank their use of information in the audit processes. The result indicates that information technology is used by senior auditors in their organizations, auditors are motivated to use information technology because shortens the time of the audit processes and gets their job done in a more efficient manner. So

there is a positive effect of technology on professionals at an individual level and workgroup level.

Table (4): Usage of information technology software by auditors

Software	Percentage
GAS	3.6
CAAT	12.5
MUS	8.9
Microsoft Excel	35.7
CaseWare	26.8
Other	12.5

This study was conducted in Nigeria to search for what extent are internal auditors use technology tools, and to what extent do internal auditors rely on audit tools for effective audits. the questionnaire was designed and distributed to the sample of study who were all internal auditors of all companies in Lagos state, in Banking, Insurance, Consumer-Goods, Pharmaceuticals and Oil & Gas sectors on the Nigerian Stock Exchange. To assess the hypotheses formulated for the study was used Analysis of variance (ANOVA).

The result of the study, data analytics software which is shared in the banking and insurance sectors, is the audit resource and scheduling software shown that using it is prominent in the banking sector and the respondents for the questionnaire showed their use all the time. on the other hand, there are more occasional users of consumer goods, but use is low in the oil and gas and pharmaceutical sectors.

Table (5): Results of ANOVA on the extent of technology usage by internal auditors

		Sum of Squares	df	Mean Square	F	Sig.
Level of Audit Automation	Between Groups	8.243	4	2.061	10.777	.000
	Within Groups	32.126	168	.191		
	Total	40.370	172			
Audit Tools Assessment	Between Groups	16.276	4	4.069	27.086	.000
	Within Groups	25.238	168	.150		
	Total	41.514	172			

Technology Role of Fraud

The aim of this research is to investigate the auditor's perception of fraud. The role of corporate governance and technology to prevent fraud by UAE. The state audit institution SAI in the UAE indicates to that authorities are seeking to recover more than $272,4 million lost caused by business fraud.

There is a role in IT and traditional techniques in the audit to prevent fraud, and there is no difference in the use of the traditional technique for internal auditors and external auditors in UAE. However, the internal audit must rely on technology more than external auditors.

Using technology by auditors makes the owner of companies explain their concern about the organization become a victim of crime in future. So, the important role that internal auditor suggests, it is working to improve their ability to deal with a risk evaluation and business risk and risk related to fraud and technology. While the

external auditor is responsible for audit efficiency, the management and the audit committee have contribution through a comprehensive assessment of the effectiveness of the external audit process.

Although technology improves internal control for companies and has an effect on risks. however, using technology may create another risk related to the protection of hardware and data, or the potential introduction of new types of errors if there is too much reliance on hardware and software capabilities.

This study determines potential risks related to auditing that IT-based accounting environment according to several reasons. First, Inadequate Security. data security function is to protect the confidentiality, integrity, and availability of the IT assets. security is classified into two parts, one of them is logical security which focuses on traditional controls such as the password to access the data and programs, and physical security to restrict reach to equipment. In an accounting system based on technology, one of the risks is accessing or changing data systems. The existence of IT security policy with not implemented and ineffective fosters technology crimes because IT-based accounting systems are more easily manipulated than manual accounting. Also, fraud may happen with advanced systems that are difficult to follow. in addition, to computer abuse like IT-Related Fraud, IT-Related Viruses, and IT-Related Hacking.

The second kind of risk is data Integrity. The data may be invalid in the accounting system because of problems with data entry, improper computer processing, incorrect program coding, the lack of competence of a client's personnel in IT and the unreliability of accounting software.

The third kind of risk is the visibility of audit trails. The audit software must be able to provide an audit trail. Although the improvement in accounting software, there is still concern about shortcomings. So, in the accounting IT-based, the ability to track

the audit trail is threatened by developing inappropriate accounting software. Besides, shifting to electronic commerce. Using electronic commerce changes the way in which the data is processed because most of the transactions happen without any paper and using communication links for transacting.

The last kind of risk is the possible reduction in Internal Controls. Entering IT-based accounting systems influenced internal control, because of the lack of separation between duties, and the possibility of accessing and altering data through a computer and recording some transactions automatically without explicit management authorization. If the adequate internal control system is not implemented it may commit fraud, errors and unauthorized transactions by strangers.

Technology Challenges in Developing Countries

Cybersecurity

First, the big challenge facing developing countries in technology is the cybersecurity. The developing countries rely on products introduced by the western world and use the technology that developed by the same countries to protect their information. The developed countries started exploiting the weaknesses of cyberspace to gain supremacy and influence on competitors. So, a cyber attack can harm the national interest of all countries especially damage economic growth. because the internet is unlimited worldwide an attacker can harm countries by the computer in these countries that cybersecurity is weak and the attacker are anonymous that anonymity offered by cyberspace has helped criminals to get away. in addition, and the openness of the Internet needs effective policies cybersecurity to have a safe and secure internet.

So, the problem is the software and hardware control by developed countries that makes developing countries vulnerable to espionage and manipulation.

Managing Innovation and Technology

Most of the innovations belong to developed countries, Japan, Switzerland, and North America, and there is nothing belongs to developing countries like China, Brazil, India. The reason for their backwardness is political instability, governance condition, low education level, lack of world-class research universities, and poor technology management. In addition, the companies that have advanced technology in developing countries they lack knowledge of detailed ideas about the technology. besides, the lack of technology executives, and managers, the company failed to build a local infrastructure. The level of education is low that stand as a barrier to managing to develop the technology. Most of the graduate from developed countries when back to their countries, they have no idea how to approach a technical, social and cultural environment in their country. although the importance of the role of the government to a significant role in developing new technology and innovation management, however, if realized it the results are not satisfactory.

The developing countries invested in education and training and achieve a good progress at all level. They pay attention to the result of education to skills that go beyond academic achievement and to technical and vocational training this put them in a paradoxical position. there is increased for learners, and they do not find jobs that suit their education, and employers complain of a lack of skills and mismatches. The problems for these countries, especially the poor ones is that they find it difficult to diversify their economy and get business and technological capabilities and more sophisticated goods and services.

Overcome Challenges to Use Technology

Business college who is responsible about future managers, and provide graduates with skills that demanded by the market. Rapid development in IT and is challenge facing business today, there is needed to restructuring accounting education where it

is allowed for employer recognize ability of accounting graduates. The education must be developed to achieve student desire to learning, and change education based on knowledge to a process oriented. across improve the accountant skills, and their education to be in line with changing business environment. in addition, close the gap by apply business environment based strategies in education for example; using technology and skills development by using technology and accountant packages. Computer skills are necessary even a new employee enters the market and have a computer basics and technology skills required at workplace.

Technology managers and innovation managers are important, but in developing countries is not practiced. It is difficult to decide their job description, but they should always think about innovation. The chief technology officers should have a strong background in technology engineering, and IT, a management. They should focus on technology and create competitive advantages through the benefit of technology. The government should also take initiatives to improve and develop new infrastructure. adoption a long plan to develop a science, and technology, like China's plan to become an "innovation-oriented society" by the year 2020. also, the government should support innovation and technology management, as India to promote innovation, technology.

The countries differ in the way of the workforce development system. it is one of the challenges is achieve balance between infrastructure and response to workforce adapted to market condition and requirement. the organizations should put criteria for evaluating their operation, productivity, efficiency, and comparison between others in the same job, who it is better, and how they did it. also learn to adapt to condition and the environment to become standard for performance. This process allows organizations to adapt to the market and improve their performance.

The government should look to supply and demand and achieve consistency in high level development policies. the high degree of coherence between demand and

supply achieve economic growth by employability of trainees and providing the worker needed by companies.

Overview of IT-based Audit in Saudi Arabia

This study shows that using technology in audit increasingly in Saudi Arabia, and audit firms have an accounting system based on technology, and there is a tendency for adopting a technology-based accounting system and develop systems to confrontation risks of systems. Saudi Arabia as a developing country has a high risk of using technology than developed countries because of lack of competence a client's personal in IT, unreliable software. In addition, the accounting and auditing is still in its infancy, and there is the gap between accounting education and accounting practice (IT-based accounting systems).

In fact, adoption of technology in accounting environment contributed to influence the level of audit risk in Saudi Arabia. This can be explained, with a number of risks in IT based accounting environment such as staff inefficiency in dealing with accounting software, the unsuitability of client’s accounting software, and the weakness of internal control system. On the other hand, by the existence of a number of audit firms unqualified to audit in accounting environment based on technology, especially with regard to applying an inappropriate audit approach and examining the reliability of accounting system with lack auditors competence in auditing this system. These firms are not familiar with the saudi audit standard in IT based accounting environment in SA.

So, IT based accounting environment to implementation of technology on audit The auditors who are audit based on IT should take into consideration the risk level when they audit in IT based accounting environment. They should pay more attention to understanding a client's accounting software. in addition, the audit firms should invest in their staff who is an audit with using technology by conducting training

sessions for them. otherwise, the ability of staff will be poor that lead to raising the possibility of failure in detecting critical misstatements which very costly. also, the audit firms should comply with the requirements of the Saudi audit standard in an IT-based accounting environment especially the audit approach by using CAAT software to enhance trust users and protect themselves. Besides, the Saudi Organization for Certified Public Accountants (SOCPA) should develop the audit standard in the organization that use the computer to be proper for IT based accounting environment and to be understandable by conducting training for auditors. (SOCPA) should ensure the efficiency of auditors through including some courses covering auditing in an IT-based accounting environment, for example, a requirement for passing professional exams. Furthermore, they should ensure the quality of the work of audits firms and follow up firms that do not comply with audit standard.

Conclusion

The use of the computers for data processing in business gets widespread and IT integration gets intricate. although developing country is still late in using technology in auditing, many developing countries rely on the technology of developed countries that contributed rise risks and fraud, such as Inadequate Security. The existence an IT security policy with not implemented and ineffective fosters technology crimes because IT based accounting systems are easily manipulated than manual accounting. Also, The fraud may happen with advanced systems that difficult to follow. in addition, computer abuse like IT-Related Fraud, IT-Related Viruses, IT-Related Hacking. The challenges facing developing country to adopt the technology, as Cybersecurity, and managing innovation and technology, and Workforce. Developing countries should adopt the plan to overcomes this challenges, should work on restructuring accounting education where it is allowed for employer recognize the ability of accounting graduates. and change education based on

knowledge to process-oriented, to be in line with changing the business environment. The governments should also take initiatives to improve and develop new infrastructure. adoption a long plan to develop a science, innovation, and technology, like China's plan to become an "innovation-oriented society" by the year 2020. also, the government should support innovation and technology management, as India to promote innovation, technology.

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