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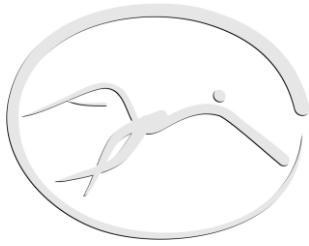
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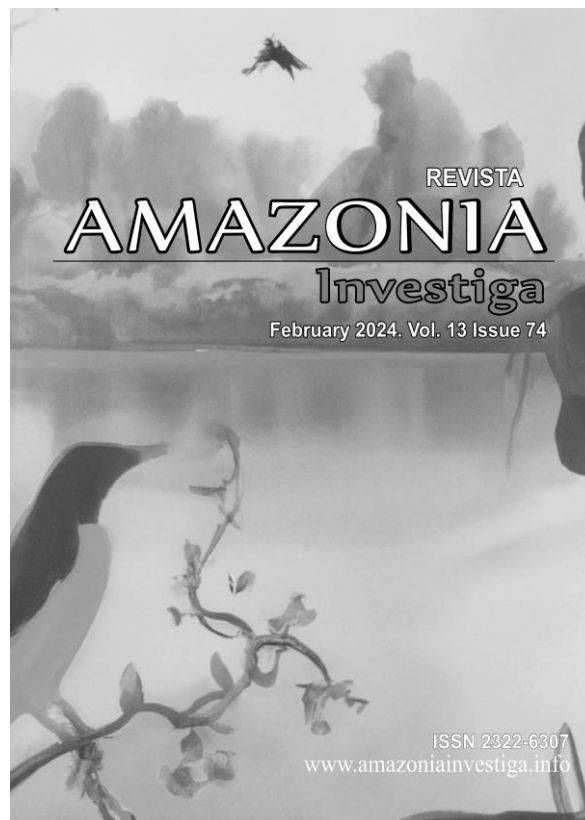
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CONTENIDO

Digital technologies in accounting and reporting: benefits, limitations, and possible risks

Las tecnologías digitales en la contabilidad y la elaboración de informes: ventajas, limitaciones y posibles riesgos

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
Abstract

Digital technologies are the need of the hour in the accounting field in the current 4th industrial revolution. Digital transformation positively and negatively affects all areas of business. The new technologies are disrupting the accounting field. Digital transformation is pressuring accounting practitioners and graduates to learn digital skills but despite the emergence of new technologies in the accounting field, it is unfortunate that not much is known concerning the impact of digital technologies in the accounting field. This paper critically examines the contribution of digital technologies in accounting and reporting focusing on its advantages, limitations, and possible risks. A systematic literature review methodology, inductive approach and thematic analysis was adopted. Despite the limitations of digital technologies in accounting like poor data governance systems, cyber-attacks, and

Resumen

Las tecnologías digitales son la necesidad del momento en el campo de la contabilidad en la actual 4ª revolución industrial. La transformación digital afecta positiva y negativamente a todos los ámbitos de la empresa. Las nuevas tecnologías están perturbando el campo de la contabilidad. La transformación digital está presionando a los profesionales de la contabilidad y a los licenciados en contabilidad para que aprendan competencias digitales. Se adoptó una metodología de revisión sistemática de la literatura, un enfoque inductivo y un análisis temático. A pesar de las limitaciones de las tecnologías digitales en la contabilidad, como los sistemas deficientes de gobernanza de datos, los ciberataques y la violación la privacidad, se puso de manifiesto tecnologías digitales desempeñan un papel importante el suministro de datos e información contables en tiempo real, la automatización de las actividades contables

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infringement of privacy, it emerged that digital technologies play a significant role in the provision of real-time accounting data and information, automation of routine accounting activities, visualization of accounting information, augmenting big data analysis, and eliminating errors as well as improving efficiency in accounting. Digital technologies are transforming the accounting arena by boosting efficiency and effectiveness. We recommend accounting professionals, practitioners and policy makers should invest in new digital technologies.

Keywords: Accounting practices, digital technologies advantages, limitations, risks.

rutinarias, la visualización de la información contable, el aumento del análisis de macrodatos eliminación de errores, así como la mejora de la eficiencia en la contabilidad. Las tecnologías digitales están transformando el ámbito de la contabilidad al impulsar la eficiencia eficacia. Recomendamos a los profesionales de la contabilidad, a los profesionales y a los responsables políticos que inviertan en nuevas tecnologías digitales contables.

Palabras clave: Prácticas contables, tecnologías digitales ventajas, limitaciones, riesgos.

Introduction

Modern digital technologies like Artificial Intelligence (AI) and Industry 4.0 have revolutionilised the accounting and auditing profession tremendously (Munoko et al., 2020; Al-Sayyed et al., 2021; Han et al., 2023;) as confirmed by surmountable antecedent literature evidence (Lasi et al., 2014; Tjahjono et al., 2017; Loureiro et al., 2021; Jamwal et al., 2021; Polak, 2021; Enholm et al., 2022). In the current 4th industrial revolution, digitalisation of the accounting process, like what social capital is to institutional change (Hrytsaienko et al., 2022), is the trending topic that demands that accounting professionals acquire digital skills and knowledge. Digitalisation has transformed all the elements of the value chain and accounting is not an exception (Odat et al., 2023; Ramayani et al., 2023). Despite the acknowledged benefits of digitalization in accounting, from the antecedent literature point of view, there remains a significant gap in understanding its holistic impact on accounting accuracy, efficiency, and the role and relevancy of accountants in a digitized environment. Also, there still exist a void in extant literature particularly on providing a compressive environmental scanning of strengths, weaknesses, opportunities, and threats (SWOT) analysis of digital technologies in the accounting field using systematic literature review approach. As we are living in an interconnected world dominated by artificial intelligence, robots, deep learning, and machine learning, it is no surprise that these technologies are automating the accounting processes of both small and big companies around the world (Sanakuiev, 2022). It is within this context that advanced technologies are forcing accounting professionals to move away from manual routine tasks to automated processes (Kumala et al., 2021; Odat et al., 2023). Digital technologies like

macroeconomics variables (Gunanto, 2023) have a potential of increasing profitability of accounting firms and their clients.

The paper-based accounting has been associated with myriad of challenges and limitations such as errors. In modern accounting, it is deemed necessary for organizations to digitalise their accounting process so as to speed up the dissemination of accounting information in an organization. Digitisation of accounting profession perform wonder similar to what post-socialist transformation did to the EU and Polish economy (Ladonko et al., 2022). This study specifically focuses on the adoption of AI, robots and machine learning in automating accounting tasks and its consequent effect on the productivity, efficiency and accuracy of financial reporting. In light of the above, it is necessary to automate routine accounting activities whereby the invoices are digitalized. Like what AI does to does to study and research tasks (Sanakuiev, 2022), with the adoption of automated accounting workflows, there is assurance of better accounting record management (Yigitbasioglu et al., 2023). Accounting field has undergone tremendous changes over a period of time. Starting from a pre-computer epoch to a period of modern accounting which is anchored on tech-savvy society. Gone are the days in which bookkeepers depended on manual accounting. In this modern era, digitalized accounting eliminates human errors and then boosts productivity (Ratmono et al., 2023). By definition, accounting is the process of collecting, analyzing, interpreting, and reporting financial-related information. With the adoption of artificial intelligence, accountants are changing the way they analyze data and make evidence-based decisions.

With increasing competition, globalization, and technological development, the accounting profession is changing drastically (Hilali et al., 2020; Ratmono et al., 2023). Similar to what neuromarketing does to brand engagement and marketing profession (Hurzhyi et al., 2023), for accountancy professions, there is a big risk of automation which can lead to high unemployment for accountants as compared to other professions. However, the auditors' work has not been tremendously affected by the emerging digital technology, but the technologies only affected how they communicate and document accounting information (Kumala et al., 2021; Saad et al., 2022). It is with this context that auditors' efficiency has significantly improved due to their anti-crisis management and abilities to offer solution and prospect to morden organisational challenges in real time (Rybalchenko et al., 2022; Hurzhyi et al., 2023; Sembiyeva et al., 2023). These highlights related to the accounting profession concurs with evidence that adoption of digital technologies like what mortgage lending does to the construction industry (Abdullayeva & Ataeva, 2022), is a double-edged sword (Gutsalenko et al., 2018; Vdovichena et al., 2022; Otonne et al., 2023). Confirming evidence from the medical field (Sofilkanych et al., 2023), despite the emergence of new technologies in the accounting field, it is unfortunate that not much is known concerning the impact of digital technologies in the accounting field. Furthermore, studies that applied the SWOT analysis to assess the role of digital technologies in revolutionising the accounting profession using systematic literature review approach are sparse. Therefore, this paper is an attempt to critically examine the contribution of digital technologies in accounting and reporting with a special focus on its advantages, limitations, and possible risks using environmental scanning lenses (SWOT analysis). Thus, tthe aim of this research is to critically analyze the impact of digitalization, particularly AI and Industry 4.0 technologies, on the efficiency, accuracy, and roles within the accounting profession.

In light of the main research aim, the specific research question that the study seeks to answer are:

1. What are the implications of digital technologies on the accuracy of financial reporting?
2. How does digitalization affect the role and skills requirements of accounting professionals?

The paper starts firstly provides a comprehensive literature review overview to the highlighted study gap with the aim of answering the specific study questions. Secondly, the research methodology used to achieve the research objectives will be provided, third, the findings on the advantages, weaknesses, and limitation of digitation on the accounting profession will be reported and analysed. lastly, conclusion and policy implication arising from the study will be proffered.

Theoretical framework or literature review

This study is informed by the Technology Acceptance Model. This model was developed by Davis et al. (1989). This model was anchored on the need for the application of technology in the 1980s by the Massachusetts Institute of Technology and BM Canada. This model is used as the theoretical lens with which to assess the acceptance of new technologies as proposed by Davis et al. (1989). It is within this context that accounting history has evolved owing to the emergence of digitalized information and communication technology (Ramayani et al., 2023). With the emergence of digitalized technologies and tools, the transformation of the accounting field has been witnessed whereby timely and relevant accounting information is shared with internal and external stakeholders instantly.

Drawing from the insights of the Technology Acceptance Model, it is not surprising to note that digitalized information and communication technologies offer more responsiveness in terms of recording accounting data and information (AlNasrallah, & Saleem, 2022; Ramayani et al., 2023). The acceptance of digital technologies like artificial intelligence and deep learning has improved the quality of accounting information and also augmented the level of disclosure and transparency. The adoption of digital technologies in the accountancy profession has ensured efficiency in the provision and dissemination of accounting information.

More interestingly, small and medium enterprises are also adopting e-accounting in line with the digitalization paradigm shift of the 21st century (Kumala et al., 2021). E-accounting offers a solution for the disclosure and transparency of financial information. Despite the importance of e-accounting to small and medium enterprises, it is evident that they have to consider many factors before adopting digital technologies in the accounting field. These factors are the availability of digital skills and

competencies, the cost of the e-accounting system, the culture of the organization, and the limitations of e-accounting software.

Extensive literature evidence from existing studies have shown that digital technologies are useful to efficiency, effective service delivery and customer satisfaction (Demirkan et al., 2016; Tekbas & Nonwoven, 2018). For example, Kozarkiewicz (2020) find that digital technologies enable organizations to keep abreast with ever changing customer needs, overcome threats by creating new and better competitiveness opportunities which brings value for future sustainability. Moreover, financial sustainability of accounting firms is increased by digitisation of core business functions and abandonment of cumbersome and demanding manual processes towards operations automation due to increased speed, accuracy, and cost-effectiveness of performance and boosting audit quality and efficiency (Payne & Curtis, 2017; Al-Htaybat et al., 2017; Clohessy et al., 2017; Hilali et al., 2020; Verhoef et al., 2021). These benefits accrue due to new avenues opened by digital transformation like cloud computing, which allows firms to use latest accounting software and infrastructure (Trigo et al., 2014; Pedrosa & Costa, (2014, 2020) as well reduced forecasting errors Bin-Abbas & Bakry, 2014; Tsai et al., 2015; Rezaee et al., 2002; Manita et al., 2020; Erasmus & Marnewick, 2021; Papagiannidis et al., 2023. Accounting information production cost are significantly reduced by digital technology usage and ensures its timeous and continuous availability (Correia et al., 2019; Sofilkanych et al., 2023), enabling easy storage, processing, and analysis of large volume of data critical for decision-making (Maciejewski, 2017; Rippa & Secundo, 2019; Sheng et al., 2020). Though the way auditors communicate, and document accounting information is adversely affected by the emergency of digital technology (Kumala et al. (2021) in contrast, efficiency and accuracy of tasks, information reporting and interpretation, is enhanced since all transactions are conducted in an electronic environment (Begum, 2019; Phornlaphatrachakorn & Kalasindhu, 2021) and real-time accounting automated enable firms to efficiently review their processes and procedures and address loophole promptly. For example, Begum (2019) finds that the use of blockchain technology ensures the immutability of shared records via decentralization of the digital ledger.

Additionally, evidence have shown that the appetite to adopt digital accounting information system, financial reports quality, and the effectiveness of strategic decision-making is much dependent on the speed of digital transformation (Phornlaphatrachakorn & Nakalasindhu, 2021; Al-Htaybat et al., 2017). Digital technologies hae also a darker side. The first risk is vulnerability to internet hackers which endangers the whole organizations, clients and individuals' employees' private and confidential financial information and also compromising the reliability of source data and financial statements (Barta, 2018; Thottoli, 2021). Cloud computing-based technology for example enforces certain threats like inadequate data protection and confidentiality (Chou, 2015), another risk include increase in structural unemployment of accounting professionals due to their perfect substitutability with digital technologies which are much efficient, more reliable, more precise and cost effective. Interestingly, like evidence from the medical field (Sofilkanych et al., 2023) and neuromarketing (Hurzhyi et al., 2023), despite the emergence of new technologies in the accounting field, it is unfortunate that not much is known concerning the quantifiable (monetary value) of losses, unemployment compensation claims and number of new jobs created due to risks caused by digital technologies risks in the accounting firms which have adopted AI, robots, softwares and machine learning. This is suggested as the new direction further studies should pursue.

In conclusion, the digital transformation is a catalyst for efficiency, accuracy, and innovation in accounting. It enhances the role of accountants, allowing them to focus on more creative, non-routine tasks. For auditors, it contributes to precise planning, analytical review procedures, relative importance assessments, internal control evaluations, and continuity decisions (Herbert et al., 2016; Gulin et al., 2019). The adoption of digital technologies is not only beneficial for organizations but also revolutionizes the roles and responsibilities of accountants and auditors in the ever-evolving digital landscape. But it also has a darker side. Thus, in light of the SWOT analysis, digitisation of accounting field has strength, weaknesses, creates opportunities and threats. Surprisingly, studies that applied the SWOT analysis to assess the role of digital technologies in revolutionising the accounting profession using systematic literature review approach are sparse. Thus, this study seeks to close this extant literature gap.

Methodology

General background

The research is grounded in technological acceptance theory, addressing a gap in the literature concerning the impact of digital technologies in the accounting field, and seeks to contribute to the field by attempting to critically examine the contribution of digital technologies in accounting and reporting with a special focus on its advantages, limitations, and possible risks. The study adopted a series of scientific method to answer the research questions.

Like similar studies Nurgaliyeva et al. (2022) Sofilkanych et al. (2023), the study applies the critical realism philosophy, induction, methods of logical and structural analysis, deduction narrative enquiry, systematic literature review, comparison as well as concretisation and formalisation. Guided by the technological acceptance theoretical model and the study was done considering the priority principles of conducting comprehensive research, using a systematic approach. Detailed procedure followed to accomplish the task, as well as the inclusion and exclusion criteria are addresses in the section.

Instrument and procedures

The selection process was aided by bibliometrics software, ensuring a thorough and replicable search strategy. The review followed four fundamental steps in line with the review protocol adopted similar studies (Vdovichena et al., 2022; Enholm et al., (2022) and Nurgaliyeva et al. (2022). Firstly, framing the research question and the search criteria for articles to be reviewed (identification stage). Secondly, the searching for relevant articles using search criteria (Screening stage). The search terms used are "advantages, risks and limitations of AI, robots and machine learning in accounting and reporting". Thirdly, assessing the articles for relevance to the study in line with inclusion and exclusion criteria (eligibility stage). The inclusion criteria were based on relevant literature searches of global databases on the research topic in professional journals, monographs, and materials of scientific conferences using the search words from step 2. The searched data bases are Scopus, IBSS, Google Sholar, Science Direct, and Web of Science. Lastly, summarising the outcomes from the review and interpreting the findings (inclusion stage). The exclusion criteria employed is exclusion of grey literature and studies which that used other digital technologies other than AI, robots and machine learning. The analysis of the review findings was presented using thematic analysis. The review process is expanded in Figure 1. For example, Figure 1 illustrates the step-by-step process of our systematic and inductive literature review, detailing each stage from identification to inclusion.

Google scolar Scopus database search (n= 78)

Reviewing of titles and abstract and also based on recency (2014 to date) to exclude old and irrelevant literature (n= 41)

Assessing of introduction to exclude articles found to be irrelevant and from grey sources (n= 15)

Examination of full articles for inclusion or exclusion (n= 26)

Scopus articles included in the systematic review (n =26 Scopus literature articles)

Figure 1. Systematic, deductive and inductive literature review process.
Source: authors' own development

Data analysis

The study applies the thematic analysis analysis on three emerging themes from the four-step systematic, deductive and inductive process. The three emerging themes emanates from the search words are "advantages of using AI, robots and machine learning on accounting and practice", limitations of using AI, robots and machine learning on accounting and practice" and "risks of using AI, robots and machine learning on accounting and practice". There results will be reported through the narrative and use of tables approach as per the three emerging issues. Since this is a qualitative study, we check for trustworthiness of the systematic literature reviewed by only using verifiable and articles from accredited international referred journals and exclude grey literature as well as data triangulation. The methodology is not free from shortfalls. For example, it does no segregate advantaged and risks of digital technologies of developing, developed and emerging economies differently which require a case study approach as well as quantitative design. Moreover, given that it's a qualitative study it cannot show the extent of the impact of digitisation on accounting profession based on hypothesis testing.

Results and discussion

The systematic, inductive, and thematic literature review evidence on advantages, risks and limitation of digital technologies on accounting and reporting are summarised in Table 1. The detailed narration in the context of body of knowledge of the study finding follows the table.

Table 1.

Advantages, risks, and limitations of Digital technologies on accounting and practice

Themes	
Advantages	* Digital technologies like leveraging AI, cloud computing, big data analytics, and deep learning advancements can improve accounting and auditing practices. * Digital technologies like artificial intelligence (AI) boosting audit quality and efficiency. * Digital technologies also lead to time saving in audit tasks and allows auditors to allocate their time and effort effectively. * Digital technologies reduced audit costs and enhanced productivity and dependability in accounting and reporting profession. * Digital technologies foster accuracy, precision, and data quality leading to better financial reporting and analysis.
Risks	* Cyber-security risk – digital technologies are vulnerable to internet hackers which endangers the whole organizations, clients and individuals employees private and confidential financial information and also compromising the reliability of source data and financial statements. * Cloud computing-based technology like Gutsalenko et al. (2018) observed enforces certain threats such as inadequate data protection and confidentiality. * Digital technologies lead to high structural unemployment of accounting professionals due to their perfect substitutability with digital technologies which are much efficient, more reliable, more precise and cost effective. * Shortages of technologically competent and experienced accounting professionals like auditors in the job market. * Environmental factors like poor macroeconomic performance which affect the size of a client's business since digital technologies yield economies of scale and scope on a larger accounting clients and tasks.
Limitations	* Exorbitant cost of digital accounting softwares to perform computer-assisted auditing tools and techniques (CAATs) hinders digital technologies in accounting profession. For example, Pedrosa and Costa, (2014, 2020) find that computer-assisted data mining techniques are still neglected or used by only a few practicing accounting professionals. * Unavailability of generalized audit software (GAS) in a variety of languages as hinderances of digital technologies on effectiveness of accounting and reporting. * Inadequate computerised auditing training as well as limited understanding of special functions of audit software by audit assistants. * Unreliable digital technologies complements like reliable internet connectivity and electricity especially in developing economies

Source: authors' own development

Theme 1. Advantages of digitisation on accounting and reporting

Evidence from extant literature evidence show that digital technologies like leveraging AI, cloud computing, big data analytics, and deep learning advancements can improve accounting and auditing practices (Clohessy et al., 2017; Verhoef et al., 2021) by boosting audit quality and efficiency (Payne & Curtis, 2017; Hilali et al., 2020). Similarly, Yigitbasioglu et al. (2023) find the adoption of automated accounting workflows results in better accounting record management and Jain (2023) observes green innovation do to catalyse investment perception and firm performance. Digital technologies also lead to time saving in audit tasks, which allows auditors to allocate their time and effort effectively (Thottoli et al., 2022), reduced audit costs and enhanced productivity and dependability (Correia et al., 2019; Sofilkanych et al., 2023) as well as improving management effectiveness (Hilali et al., 2020), accuracy, precision and data quality (Bin-Abbas & Bakry, 2014; Tsai et al., 2015; Rezaee et al., 2002; Manita et al., 2020; Erasmus & Marnewick, 2021; Papagiannidis et al., 2023). However, Kumala et al. (2021) find the auditors' work has not been tremendously affected by the emerging digital technology, but the technologies only affected how they communicate and document accounting information. Thus, there is further which exact aspects of accounting information and documentations which were affected more. However, the auditors' work has not been tremendously affected by the emerging digital technology, but the technologies only affected how they communicate and document accounting information (Kumala et al., 2021. It is with this context that auditors' efficiency in these areas of accounting has significantly improved, due to anti-crisis abilities and offer solution and prospect to modern organisational challenges (Rybalchenko et al., 2022; Hurzhyi et al., 2023; Sembiyeva et al., 2023). Like evidence from the medical field (Sofilkanych et al., 2023), despite the emergence of new technologies in the accounting field, it is unfortunate that not much is known concerning the impact of digital technologies in the accounting field.

Theme 2. Risks of Digital technologies on accounting and reporting

Literature review evidence shows that like similar in professions suck as marketing (Hurzhyi et al., 2023), medical science (Sofilkanych et al., 2023), government department (Odat, 2023) and green energy sector

(Sembiyeva, et al., 2023), digitisation poses dangers to accounting and reporting profession. This concur with evidence that adoption of digital technologies like what mortgage lending is to the construction industry (Abdullayeva & Ataeva, 2022), is a double-edged sword (Gutsalenko et al., 2018; Vdovichena et al., 2022; Otonne et al., 2023). The first risk is vulnerability to internet hackers which endangers the whole organizations, clients and individuals' employees' private and confidential financial information and also compromising the reliability of source data and financial statements (Barta, 2018; Thottoli, 2021). Cloud computing-based technology for example enforces certain threats like inadequate data protection and confidentiality (Chou, 2015), another risk include increase in structural unemployment of accounting professionals due to their perfect substitutability with digital technologies which are much efficient, more reliable, more precise and cost effective. Interestingly, like evidence from the medical field (Sofilkanych et al., 2023) and neuromarketing (Hurzhyi et al., 2023), despite the emergence of new technologies in the accounting field, it is unfortunate that not much is known concerning the quantifiable (monetary value) of losses, unemployment compensation claims and number of new jobs created due to risks caused by digital technologies risks in the accounting firms which have adopted AI, robots, softwares and machine learning. This is suggested as the new direction further studies should pursue.

Theme 3. Limitations of digital technologies on accounting and reporting

Thematic analysis finds the limitations of of digital technologies on accounting and reporting are unreliable internet speed and connectivity as well as reliable power supply especially in developing countries. Environmental factors and availability of technically competent accounting profession also act as limitation to the effectiveness of digital technologies on accounting and reporting (Thottoli et al., 2022). The main constraints towards adoption of emerging digital technology tools for audit software in the audit process are observed are inadequate computerised auditing training as well as limited understanding of special functions of audit software by audit assistants (Abou-El-Sood et al., 2015; Thottoli, 2021) For example, Widuri et al., (2016) observe shortage of technologically competent and experienced auditors in the job market, environmental factors, expectations, the size of a client's business, and the unavailability of generalized audit software

(GAS) in a variety of languages as hinderances of digital technologies on effectiveness of accounting and reporting. The cost of digital accounting softwares to perform computer-assisted auditing tools and techniques (CAATs) is another limitation towards adoption of digital technologies in accounting profession. For example, Pedrosa and Costa, (2014, 2020) find that computer-assisted data mining techniques are still neglected or used by only a few practicing accounting professionals. despite the emergence this limitation it is unfortunate that not much is known concerning the minimum accounting firm size which can adopt these technologies without imposing a heavy financial burden on the firm and the comparative values the firm will gain visa viz losses incurred it adopts digital technologies like AI, robots, softwares and machine learning. This is suggested as the new direction further studies should pursue.

Conclusions

The study seeks to identify advantages, risks and limitations pf digital technologies on accounting and reporting. It was found that digital technologies are a double aged sword. It has both the bright and darks sides. The bright side of digital technology is improvement of accuracy, speedy and efficiency of accounting and reporting. It also reduces auding costs and enhance efficiency, dependability, and productivity accounting professionals. In contrast, digital technology's darker side includes vulnerability of organisations, employees, and client's confidential financial information through risks like hacking, which also compromise the reliability of financial statements. It also leads to structural unemployment when accounting professional are substituted by digital accounting information systems. Lastly, there are limitations to application of digital technologies to accounting and reporting. such limitations include inadequate training and preparedness of accounting professionals to use digital technologies. It is recommended that accounting professionals and practitioners as well as policy makers should massively invest in new accounting digital technologies in the current 4th industrial revolution. Also, more training of accounting professionals is required for the to keep abreast with highly evolving digital accounting technologies. Lastly, cyber security and firewalls of digital accounting system needs to be upgraded to curb cyber threats like hacking. Looking, forward, digitisation align well to the philosophy of creation by destruction, where

some accounting roles will face extinction while new ones are created. Overall, digitisation of accounting profession has more strengths, create more opportunities, is associated with weakness and threats.

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