DIGITAL ACCOUNTING FOR THE NEXT FUTURE: STIMULUS, TRANSITION AND JOURNEYS

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ABSTRACT

As part of the transition to the digital age, accounting has both a substantial role and a responsibility to society, the importance of which is divided between the legal obligation and the managerial obligation. Consequently, the goal of this academic research was to assess the impact of the accountant and technological advancements on the transition to digital accounting. In order to meet the goal of this paper, interpretative methods were employed to obtain data from a review of the relevant literature. According to the debate in this paper, it is decided that the time accountants spend in their everyday work environments providing services necessitates a transformation. Regarding the influence and evolution of automatisms in the profession, the positive effects of automatisms are evident, disproving the idea that the transition to digital accounting poses a threat to the survival of the accounting profession. This article's findings imply that accountants will be able to enter different industries, fostering their intellectual and personal growth. In this way, accounting can continue to show how important it is to society and become an even more respected job.

Keywords: Accountant, Digital Accounting, Transition, Industry 4.0, Digital Technology

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Introduction

Due to a general perception that conformity with accounting standards and their implementation was required to provide high-quality accounting information, traditional accounting remained unchanged for many years (Yigitbasioglu, Green & Decca Cheung, 2022). Therefore, the existence of this assumption raises the question of whether accounting is truly a profession, given that the definition of a profession does not include mere conformity with regulations (Zhang & Chen, 2020). At this juncture, accounting as a profession begins to be questioned, and an emergency shift is proposed before its extinction (Lehner, Leitner-Hanetseder & Eisl, 2019). This transformation must emerge from accounting researchers, stakeholders, and stakeholders with the goal of reversing this decrease and presenting an alternative to conventional accounting (Stefanescu et al., 2019). Recent technological advancements have transformed the corporate paradigm we are currently experiencing and are causing a time of conversion in human culture (Kurtz, Herrera & Moussalli, 2006). In this context, it is claimed that technological advancement may be the answer to the problem of finding an alternative to traditional accounting. Proponents of artificial intelligence contend that the machine can learn these rules and implement them as if it were an expert in fields such as finance and accounting (Biernacki, Krasodomska & Zarzycka, 2019). In light of the fact that accounting is a profession susceptible to change as a result of process automation, it will face greater challenges than any other (Association of Chartered Certified Accountants (ACCA), 2022). Accounting may benefit from technological advancements and be threatened by them (Zhang & Chen, 2020).

Some academics (Faruque, Dinavahi, & Xu, 2005; Kurtz, Herrera, & Moussalli, 2006; Pearson & Singleton, 2008; Troshani et al., 2018; Nodgren et al., 2019; Yigitbasioglu, Green, & Decca Cheung, 2022) are of the perspective that innovation will represent a challenge to the profession, culminating in its extinction of professionals, other academics (Phillips & Halliday, 2008; De Villiers, Rinaldi & Unerman, 2014; Kruskope et al., 2019; Hanetseder et al., 2021) believe that change should be viewed as an opportunity because it will create new job opportunities and lead to the growth of the profession. Accountants are motivated by the possibility of innovating and revitalizing their profession because they wish to be freed from the duties and responsibilities imposed by the government (Lehner, Leitner-Hanetseder & Eisl, 2019). Accountants ought to concentrate on a few fields with a bright future. However, given the unpredictability of the future, more authors and stakeholders in the accounting industry will be required to steer businesses and accountants in the right way (Matt, Hess & Benlian, 2015). This background of change and problems for accountants contributed to the justification of the current study. Given the paucity of research in this area, particularly in Portugal, it is vital to explore accountants' perceptions of the current and future consequences of the shift to digital accounting.

This academic paper's objective is to analyze the accountant and technology evolution confronting the shift to digital accounting. The following is the initial question that this study intends to address: What are the accountant's and technology evolution's perspectives on the move from traditional to digital accounting? In accordance with the purpose, it is planned to study the accountant

and technological evolution in terms of: the impact of the implementation of automatisms and dematerialization on the accounting profession; and the challenges, challenges, and opportunities associated with the transition to digital accounting.

The accountant and evolution of technology

The new age, described as the 4th Industrial Revolution, is the most complete and extensive in human history. This is a historical move in which civilization coexists with the new, as exemplified by new technology and advancements that have revolutionized life as we know it (Chae & Olson, 2022). According to Jiang et al. (2022), the fourth industrial revolution is not a new revolution but rather a continuation of the third industrial revolution, during which the use of process automation to improve autonomous and intelligent systems began. In this new era, uncertainty in the operating environment is present regardless of the sector of endeavor or organizational structure. Over the years, this change has been linked to the future of accounting as a profession, making people wonder what effect it will have on accountants.

The book titled "Professionalism and Accounting Rules" by West (2003) had an unquestionable impact on the accounting profession by highlighting the significance and relevance of accounting as a profession. West (2003) analyzed the consistent emphasis placed, both in practice and in accounting education, on accounting standards and their compliance. According to West (2003), there is a common view that accounting standards and their application are required and sufficient for the production of high-quality accounting information. Still, the quality of accounting is based on how well it explains the event or situation it is meant to show.

Clarke, Dean, and Oliver (1997) noted that compliance with standards neither defines nor is compatible with the general definition of a profession, thereby calling into question whether accountants are truly professionals and whether accounting is truly a profession. According to West (2003), this assumption that compliance with norms, consistency, and precision is adequate for the quality of the profession originates and persists in the teaching profession. From the point of view of Hines (1989), important questions like whether accounting can help build a society are ignored.

According to West (2003), accountants are too concerned with precision, emotionally aloof, conservative, and obsessive with minutiae. However, this is mostly due to their inability to participate in decision-making, which restricts them to the simple fulfillment of regulations. It was confirmed that the accountant is seen as dull, concentrates too much on the short term and on costs, and, as a result, loses sight of the business's goal, which can lead to business failure (West, 2003). However, it was difficult for the accountant to focus on the long term or on other concerns because conventional accounting was defined by the absence of technology, which limited the accountant's time for the technical responsibilities of accounting, preventing him from advancing his abilities and playing a significant part in decision making (Troshani, Locke & Rowbottom, 2019; Kamkankaew, et al., 2022; Khammadee, 2022). The progression of the accountant's job was contingent on the development of technologies in the field of accounting, so that accountants could spend less time on technical chores and devote more time to other

endeavors. Initially, the use of technological systems was not required, and many businesses still opted for the manual method. However, because of its low cost and significant impact, its deployment has become an essential aspect for businesses to thrive in the market. Matt, Hess, and Benlian (2015) viewed the use of technology in accounting as occurring in three phases: the transition from manual accounting to information technology systems (IT), the implementation of integrated business management systems (Enterprise Resource Planning, ERP), and most recently, advanced digital solutions (Jovanoska, 2022). The most modern technological solutions are primarily Artificial Intelligence (AI) and Robotic Process Automation (RPA), posing the greatest challenge to the accounting profession: its automation (Lee & Tajudeen, 2020). However, some scholars, such as Appelbaum & Nehmer (2017), have included other less prevalent notions, such as "dronnovation." This notion combines three different sorts of technology: drones, robots, and bots. Due to their adaptability and ability to collect data that humans cannot, drones are becoming increasingly popular in accounting. Appelbaum and Nehmer (2017) pointed out that robots and bots make it easier to automate accounting tasks and analyze them.

Thus, technological developments are destroying jobs in the most developed economies, exposing professionals to the prospect that their position will be taken over by a computer (Cockcroft & Russell, 2018). Nevertheless, the impact of these technologies on the evolution of organizations has been relatively favorable, leading us to believe that, in the future, it will be necessary for businesses to adopt these technologies in order to survive. It's anticipated that by 2030, more than a third of the vocations that currently exist will be totally automated (Frey & Osborne, 2017). Proponents of artificial intelligence argue that in the fields of finance and accounting, where professionals operate according to a set of norms and rules, the machine may learn these norms and do the tasks of a human, thereby automatically achieving the answer (Dai & Vasarhelyi, 2017). Since the machine can do the most time-consuming duties, the accountant can participate more actively in the creation of reports and support decision-making by keeping up with this technical development (Troshani et al., 2018). Technology is speeding up the evolution of accounting because it lets accountants step in, evaluate data, and work as part of a team (Hanetseder et al., 2021).

According to West (2003), once an accountant perceives that his or her function is growing in significance within an organization, he or she transforms into an extroverted, creative, and forward-thinking professional. Kruskope et al. (2019) Nodgren et al. (2019). Troshani, Locke, and Rowbottom (2019) researched this new stereotype, and their findings indicate that the expansion of the accountant's position transforms his image into that of a more daring, strategy-advising professional. Despite the fact that accountants have recently demonstrated a better capacity to participate in decision-making, management bodies are still hesitant to allocate these responsibilities and authority to them within the organization (Nodgren et al., 2019). Seeing as this new paradigm of the accountant's role is closely tied to the application of sophisticated technological solutions, such as digital accounting, the following section of this study will focus on its characteristics.

What characteristics define digital accounting?

Changes in the economy and the marketplace necessitate a plan of ongoing strategy revision and business focus. Businesses are therefore forced by the current financial environment to increase their profitability and efficiency, opting for technical advancements that have an effect on key performance measures (Zeff, 2012). At present, guiding and encouraging firms towards digital transformation is viewed as a method of salvation for accounting professionals. Digital transformation presents an opportunity for businesses to improve their performance and market competitiveness, as well as to strengthen their interactions with customers. It is essential to recognize that technology provides firms with a resource that enables them to streamline procedures, monitor client behavior, and direct the actions of all departments, thereby helping them to evolve (Gray & Rumpe, 2017).

Digital transformation drives businesses to digital accounting, which is a concept defined by a new digital structure in which the rise of artificial intelligence and the replacement of humans by algorithms facilitate the birth and development of new concepts related to the digital economy (Helberger et al., 2022). This digital economy is viewed as the fourth industrial revolution, the most significant transformation and a historic shift in size, pace, and breadth as it transforms the way individuals live, work, and interact (Nagy & Somosi, 2022). The fourth industrial revolution is based on the digital age and is characterized by the ubiquitous and mobile internet, artificial intelligence, and teaching machines (Xia et al., 2022). Moreover, Kruskope et al. (2019) highlighted ten characteristics that a "future" accounting business might exhibit: decrease in paper support; data quality management; interfaces with other systems; process automation; generating transparency; consolidation of information integrity; big data analysis; real-time reports; visualization tools; and cloud computing.

However, while there are technical hazards associated with installing ERPs and other advanced digital solutions, the greatest risk rests in the degree of human resource expertise, especially that of accounting professionals (Jovanoska, 2022). Zhang and Chen (2020) suggested that accountants must acquire the necessary abilities to shift to digital accounting. In this view, the accountant must develop both hard and soft skills in order for there to be a greater interaction between the jobs performed by artificial intelligence and the tasks performed by humans. This paper will analyze enterprise resource planning (ERP) mentioned by Newman and Westrup (2005), Barna and Igna (2021), Pradhan and Brazel (2021), and Jovanoska (2022), as well as accounting processes and automation as described by Phillips and Halliday (2005). Drum and Pulvermacher (2016) Appelbaum and Nehmer (2017) Al-Htaybat, Alhatabat, and von Alberti-Alhtaybat (2018). Cooper et al (2019); Lee and Tajudeen (2020); Harrast (2020); Kokina et al (2021). Therefore, in order to prepare for this transformation, Korhonen et al. (2021) must develop accountants.

Introduction to enterprise resource planning systems and their value:

Initially, the deployment of Enterprise Resource Planning (ERP) created apprehension and anxiety among accountants, who anticipated a reduction in the requirement for accounting employees (Barna & Igna, 2021). Nonetheless, it simultaneously demanded more from accountants

and presented new prospects, necessitating that accountants rise to the occasion lest they miss an opportunity for progress (Newman & Westrup, 2005). In 1980, accounting professionals held a position isolated from the production process, with limited communication with management and decision-making authority. Accountants' roles evolved as a result of technological advancements; liberated from the more technical parts of accounting, they began to monitor and analyze data, generate reports, and participate in decision-making (Jovanoska, 2022). Accounting reports are at the center of its operations, and frequent changes are occurring. To remain competitive, businesses must provide real-time reports with timely and accurate information. Accountants will be supported by technological tools during this shift (Barna & Igna, 2021). The primary objective of ERP systems is to be present in all company departments in a completely integrated manner, thus facilitating the exchange of information throughout the organization. Accounting benefits from this process because it gets all transactions as they happen, which are then processed by the finance module (lsaid, 2022).

The adoption of the ERP system is not restricted to technology advancements or accounting methods; rather, it focuses primarily on the organization's capacity to adapt to organizational change. According to Pradhan and Brazel (2021), the effective adoption of an enterprise resource planning (ERP) system supports changes in organizational structure, process reengineering, new management methods, and staff skills. If properly implemented, software or a technical instrument adapts better to repetitive activities, tends to make fewer mistakes than humans, and is less susceptible to distractions and forgetfulness (Newman & Westrup, 2005).

ERP facilitated the decentralization of management accounting, allowing non-accountants to perform it at a more operational level. The system features routines that update specific records automatically when data is entered elsewhere in the system. In other words, the employee is responsible for entering data into the system, while the system is responsible for accounting processing (Jovanoska, 2022). Then, accounting professionals must work with these solutions and instruct them to avoid making errors. ERPs' processes have mistaken when they are first set up, but the accountant's help will make sure there are no mistakes in the future and that time is spent in a way that adds value to the entity where the ERP is used (Barna & Igna, 2021).

Pradhan and Brazel (2021) assess the primary benefits of this implementation, applauding, in particular, the decrease of laborious chores, such as invoice posting, which enables a faster balance sheet and income statement. Regarding the negatives, they stress the need for adequate protection and the thought that there is no absolute protection. The system can be corrupted by errors, the simplicity with which data can be modified can facilitate fraud, and the occurrence of a virus can wipe out vital data. Thus, despite the fact that the deployment of new technologies is enticing due to their benefits, it is a time-consuming endeavor that necessitates a thorough investigation. A combination of human error and computer error might cause severe damage during software implementation.

Automation and Accounting Process:

Automation of processes is the defining characteristic of Digital Accounting and is anticipated to have the most immediate effect on businesses. This is connected mostly with artificial intelligence and robotic process automation (RPA) (Appelbaum & Nehmer, 2017; Lee & Tajudeen, 2020). As previously said, artificial intelligence is defined as a group of algorithms capable of simulating a set of human qualities and behaviors in response to specific scenarios (Lee & Tajudeen, 2020). In reality, RPA is a computer software configuration that substitutes humans in specific jobs. The name RPA was developed in the early 2000s and is akin to a physical robot that conducts human operations (Matt, Hess & Benlian, 2015).

The more repetitive the jobs to be replaced by robotic processes, the easier it is to replace or eliminate human labor (Phillips & Halliday, 2008). If automated software is properly implemented, it adapts better to repetitive jobs and, lacking forgetfulness and distractions, tends to make fewer errors than humans (Kruskope et al., 2019). One of the greatest advantages of automation for businesses is increased productivity and effectiveness at a lower cost. Once mistakes made by people are cut down, the process becomes more efficient, so information can be sent quickly and with less work (Lee & Tajudeen, 2020).

Automated technology employs a large labor force with a huge potential to boost organizational capacity and save money and time. The fact that it reduces tiresome and repetitive activities and allows the professional to concentrate on higher-value areas boosts work morale (Korhonen et al., 2021). When the most time-consuming operations are performed by machines, accounting professionals may give more value to their clients while decreasing the cost and time spent on each client. Thus, the automation of operations will allow professionals to concentrate on specific and pertinent concerns (Phillips & Halliday, 2008). Even within the auditing industry, operations can be automated and sophisticated systems can uncover fraud and dangers. Thus, future auditors will be able to concentrate on data analysis rather than spend countless hours collecting data from financial statements (Al-Htaybat, von Alberti-Alhtaybat & Alhatabat, 2018).

Increasingly, software outperforms humans, and especially with automated accounting tools, the accountant is guided toward company analysis, strategic support, and beyond the mere recording of business transactions (Matt, Hess & Benlian, 2015). The profession can then expand its scope of work to include, for instance, the planning and analysis of future strategies due to the need to develop these new abilities. In this setting, the accountant should be more concerned with the utility, transparency, and clarity of information so that managers understand how to incorporate them into the organization's decision-making process (Korhonen et al., 2021).

According to the study by Korhonen et al. (2021), after the adoption of automation technology, the performance of accountants was quite favorable, as evidenced by an increase in their efficiency, a reduction in routines, and an improvement in the quality of their declarations and management analyses. With this approach, a tremendous development of knowledge and skills has

occurred, enhancing professional capacity and skills and so facilitating a more effective response to competitive pressure. According to the findings of Kokina et al.'s study, clients and users of robotic process-based technologies benefited considerably from the findings. Benefits included cost savings, increased accuracy and efficiency in procedures, increased speed, compliance with rules, fewer errors, reliability, and customer satisfaction. According to the inventors, the software is so easy to use that even professionals with no programming knowledge may be trained quickly to automate procedures.

However, not all research indicates that implementing instruments that enable the automation of operations will merely improve the accountant's performance. According to Drum and Pulvermacher (2016), the impact that human mistakes can have on an organization is one of the primary concerns of businesses transitioning to digital accounting and its sophisticated solutions. Even while automation procedures result in changes to work, programs, and routines, not all organizations will be able to deal with these alterations without difficulty and in the same way. According to the findings of Harrast's (2020) study, the accounting profession faces an uncertain future. In other words, they note in their conclusions that accountants tend not to be highly specialized in their field, as they only specialize in the small portion of jobs that cannot be automated. Following this logic, they conclude that employees are searching for jobs that can complement this technology and that they are seeking to specialize in what the tool cannot provide, leaving specialization as the foundation of the actual profession.

From the standpoint of Cooper et al. (2019), this accountant's recommendation that they must comprehend everything that these tools provide in order to supplement everything that they cannot provide is not erroneous. In addition, they state that all professions have subjective criteria and are subject to judgments, and despite the fact that they regard accounting to be based on a set of rules devoid of subjectivity, this is not true and cannot be substituted by machines. In conclusion, the effect of process automation is hard to predict, which can be good or bad for companies or experts in the field. However, it seems that putting this new idea into practice will change the job of an accountant.

As the organization adapts to new workflows as a result of the adopted technology, this has the potential to become increasingly significant in the future (Phillips & Halliday, 2008). As a result of its operational efficacy, artificial intelligence is rapidly reshaping how businesses operate, assuming significant and critical functions at a lower cost (Lee & Tajudeen, 2020). Nevertheless, according to Kruskope et al. (2019), changes in the work process tend to induce sentiments of uneasiness and dread in worker performance. In this approach, a number of authors have urged accountants to learn skills beyond the procedures that will be discussed in detail in the next section. They say that accountants won't be able to make it in this new phase of accounting without these skills (Kruskope et al., 2019).

Digital accounting: professional opportunities or challenges?

Regarding the future of digital accounting, there is a certain degree of unpredictability, which could generate opportunities as well as risks (De Villiers, Rinaldi & Unerman, 2014). Accounting will face greater challenges than any other profession since it is susceptible to change due to process

automation (Association of Chartered Certified Accountants, 2022). For this obstacle to be overcome, there must be external pressure from customers and competent authorities; otherwise, businesses will continue to believe that old methods are sufficient to meet their demands (Troshani, Locke & Rowbottom, 2019). As a result, any manager must address these uncertainties and seize opportunities; otherwise, goals will not be met (Gromling, 2016; Acaranupong, 2022).

Several studies on the impact of new technologies on the future of the professions have been conducted, and several authors and institutions have predicted the loss of several jobs in the next few years, primarily in the fields of finance and accounting. According to the 2015 study conducted by the University of Oxford (quoted in Suleiman et al., 2020), there is a 95% chance that accountants will lose their jobs. In their analysis of 702 occupations, Frey and Osborne (2017) determined that there is a possibility that 95% of the professions may vanish owing to technological advancement. Dissorn and Suwanbamrung (2022) investigated the impact of strategic human resource management on the development of professional accountants' STEP skills in the Thai environment. It can be incorporated into the Thailand-specific small and medium enterprise human resource model for the year 2030. The same analysis also predicted the addition of new employment to the market as well as the elimination of others, indicating that artificial intelligence will make the accounting profession more efficient and productive by eliminating repetitive and laborious activities. Lastly, the World Economic Forum (2020) said that the Future of Jobs Report 2020 predicted that automation will cause more than half of accountants, bookkeepers, auditors, and financial analysts to lose their jobs within five years. These professions are among the top 20 with the lowest demand across industries. Digital skills and the adoption of technology provide obstacles for Thai workers, especially accountants. It has caused accountants to lose their jobs, which is one of the top three jobs whose number of jobs is going down (World Economic Forum, 2020).

Businesses that are unable to keep pace with this technological growth will eventually fail. Some scholars (Fisher, 2004) identify variables that can influence the monitoring of technological advancement, thus making it a threat to the accounting profession and its future. Izzo, Fasan, and Tiscini (2022) suggested that the uneasiness of more seasoned accountants has been an impediment, as they feel overtaken by younger colleagues and unable to adjust to the digital age. However, many believe that corporations do not offer the same training opportunities to enhance the abilities of older individuals, thus excluding them from the digital age. It is crucial that accountants, regardless of age, have sufficient training. According to Nearon (2005), one of the greatest risks associated with the transition is that experts feel competent and grasp these artificial intelligence algorithms too soon. Chiu et al. (2019) believe that accountants will make more mistakes than in the past as a result of these changes to the industry. According to him, organizations are obsessed with transparency, which, due to the need to control the organizational environment, generates a contradiction in which attempts to promote transparency end up increasing opaqueness. According to Biernacki, Krasodomska, and Zarzycki (2019), the digital revolution places accounting in a similar dilemma, in which the revolution

will lead people to assume that once there is a massive database, there will be complete control; in reality, it will simply increase the uncertainty of the choice to be made due to the enormous volume of data to evaluate. But corporations can be held responsible if they don't keep up with technological advancements. For example, smaller businesses tend to be more conservative, and the cost and lack of resources may be one reason for their skepticism and unwillingness to try new things (Braga, 2015).

However, it can be an advantage if accountants are continually aware of the present state of their profession, and as it progresses, they must adapt to the new reality and the changes that accompany it. Accountants are undeniably valuable resources because they can conduct guided analyses and contribute to technological innovation if they are willing to adapt (Phillips & Halliday, 2008). In this manner, firms can collect, process, and review financial data to increase productivity and save expenses (Troshani et al., 2018). They should be aware that artificial intelligence technologies replace tasks, not jobs, and should not respond to change in a dramatic manner (Al-Htaybat, von Alberti-Alhtaybat & Alhatabat, 2018). As much as there are changes in the tasks of accountants, machines will only serve to replace the routine tasks of accountants as they cannot address difficulties such as ambiguity or improvise and employ imagination (Braga, 2015). Thus, the continual dualism of "human vs. machine" is antiquated and short-sighted. Instead of pondering how the machine will replace the human over time and how he will live, it is preferable to consider how individuals can collaborate and what hybrid tasks exist in order to maximize the usefulness of humans within businesses. Lehner, Leitner-Hanetseder, and Eisl (2019) note that, despite the certainty that many tasks will be replaced by automated processes, many have already realized that the future of work in our society will be a combination of human and machine labor. To survive in the sector and become competitive, accountants must therefore aim to produce value through innovation, creativity, and technological adaptability (Matt, Hess & Benlian, 2015). Increasing competition will allow for the emergence of more specialized professions, such as financial and business consultants (Kurtz, Herrera & Moussalli, 2006; Troshani, Locke, & Rowbottom, 2019). Given that accountants do not wish to perform work based on functions imposed by the government, this orientation towards other areas motivates them, adds value, and makes companies more competitive (no longer focusing solely on the short term), and therefore does not risk transmitting uninteresting and ineffective information to the organization (Zhang & Chen, 2020). In this sense, clients and businesses view accountants as business consultants who can give flexible, individualized, and adaptable service at a reasonable cost. Lin, Shih, and Lin (2018) noted that this approach is more important than worrying about how functions and jobs will change or go away.

According to Bowles, Ghost and Thomas (2020), in 2018 and 2019, the demand for accountants and the profit of accounting companies increased in both Australia and New Zealand, but at a slower rate than the economy as a whole. According to Greenman (2017), the profession in the United States is expected to grow by 11%, creating approximately 142,000 new accounting and auditing positions. There are undoubtedly a number of elements that contribute to this rise; however, according to him, a significant portion is attributable to accountants' possessing the necessary skills to adapt to technological advancements.

In Thailand, Pholinhom and Leekpai (2021) investigated the factors influencing the growth of professional skills on the quality of audits conducted by professional accountants in the economic period. To investigate the variables influencing the development of accounting information skills on the audit quality of accountants in the digital economy 4.0 by analyzing the relationship model between the development of professional skills and accounting information skills of accountants in the digital 4.0 era. Accounting data on the audit quality of professional accountants in the digital economy A 4.0 age in Thailand can be categorized into two categories: Professional accounting abilities in the digital age, including professional accounting, corporate taxation, and professional value specialist language; Management and information skills in the digital age include the ability to determine the type and scope of accounting information, the ability to successfully access the information pool, the ability to evaluate accounting information and accounting information sources, and the ability to effectively use accounting information. Furthermore, Chantabutr, Jaensirisak, and Sawettham (2021) observed that blockchain technology plays a crucial role in the creation of business models, particularly in Thai accounting, auditing, and supply chain management. The operational implementation of blockchain technology has both positive and negative effects. Accountants, auditors, managers, and regulators in Thailand should be aware of the use of blockchain technology in their job planning, data management, and risk assessment in order to avoid a variety of potential issues. Kongma (2021) noted that Thai accountants were taught how to use data analytics in bookkeeping or financial reporting, auditing, managerial accounting, accounting systems implementation, tax accounting, accounting education, and technology.

The conclusion is that, in general, a promising and inventive future is anticipated in which the interaction of man and machine will be fundamental, necessitating that humans possess a set of skills and qualities fit for success in this accounting future. Thus, in the next section, some measurements or suggestions from the many authors we've already looked at will be given in an effort to give accountants a starting point for getting the credentials they need to move to the new accounting reality.

Table 1 Evolution of digital technology on the accounting profession

Era	The role of accounting	Technological Change	The impact of digital technology on the accounting profession
1810's 1900's	Professional accountants and professional accounting	Technological systems was not required, and many businesses still opted for the manual method.	• Accounting manual method
2000-2010		Transition from manual accounting to information technology systems (IT)	• Reduction in the requirement for accounting employees

Table 1 Evolution of digital technology on the accounting profession (Cont.)

Era	The role of accounting	Technological Change	The impact of digital technology on the accounting profession
2011-2019	support business decision-making	the implementation of integrated business management systems (Enterprise Resource Planning, ERP)	• Accountant can participate more actively in the creation of reports and support decision-making by keeping up with this technical development. • Non-accountants to perform it at a more operational level.
2020	Digital transformation drives businesses to digital accounting.	Accounting automation	• Decreasing in paper support; data quality management; interfaces with other systems; process automation; generating transparency; consolidation of information integrity; big data analysis; real-time reports; visualization tools; and cloud computing • Accountant must develop both hard and soft skills in order for there to be a greater interaction between the jobs performed by artificial intelligence and the tasks performed by humans.

Source: Authors

Strategies and required actions in digital accounting

New accountants will find the move to digital accounting easier given they are unfamiliar with traditional accounting regulations, whereas traditional accountants may have more trouble. Due to the insufficiency of traditional accounting expertise, it may be impossible to hire traditional accountants, necessitating a reorganization of the accounting curriculum (Biernacki, Krasodomska & Zarzycka, 2019). In the studies of Nodgren et al. (2019), Troshani, Locke, and Rowbottom (2019), Lee and Tajudeen (2020), Zhang and Chen (2021) (2020), and Acaranupong (2022), it was stated that once new graduates begin their work experience executing the most fundamental accounting duties, new technology will impede their ability to develop these skills. The academics criticize this situation and emphasize the need to anticipate this challenge by reorganizing instruction, emphasizing that there is no need to teach the essentials because the computer will do it for them. Lin, Shih, and Lin (2018)

noted that a change is needed because students aren't ready for the modern workplace if they don't learn how to use technology.

Interestingly, in the studies by Phillips and Halliday (2008), Matt, Hess and Benlian (2015), Drum and Pulvermacher (2016), Appelbaum and Nehmer (2017) Al-Htaybat, von Alberti-Alhtaybat and Alhatabat (2018) Cooper et al. (2019). Lee and Tajudeen (2020) Harrast (2020) Kokina et al. (2021) Korhonen et al. (2021) stated that academics were the target audience least likely to adopt artificial intelligence, while accountants were most likely to accept this shift. However, both instructors and students must view this transformation as significant, as they are the only ones with the knowledge to create these accounting information systems. Currently, there is a disparity between technological trends and accounting education, and it is crucial for educators to generate future professionals and build a bridge between market demands and recent graduates' curricula (Pholinhom & Leekpai, 2021). The education system must be able to provide Thai students with a set of new abilities that enables them to utilize all emerging technologies, including social networks, big data, cloud accounting, integrated reporting, artificial intelligence, and automated processes, among others (Chantabutr, Jaensirisak & Sawettham, 2021). Accounting professors in Thailand's higher education system will be required to implement new teaching models or units, such as data analytics and cybersecurity. In conclusion, a new way of learning will be needed for accounting to keep up with the ever-changing world (Acaranupong, 2022).

However, innovation is not limited to recent college graduates, and, as previously stated, the belief that older people lack the aptitude or opportunity to obtain training in this field cannot be an impediment to progress. The knowledge and experience of these traditional accountants are crucial for assimilating and developing methods to reconcile human labor with technology. Pholinhom and Leekpai (2021) and Acaranupong (2022) have identified a series of real-world instances that focus on the development of the skills of Thai workers to adapt to the digital evolution.

In the same line as counseling both recent graduates and the most experienced, (Pholkaew & Yapa, 2017) outlined three methods for better preparation for the future: first, they urge students to take courses in technology in order to conduct accounting and finance activities efficiently; and second, they recommend that individuals obtain a bachelor's degree in order to be more prepared for the workforce. Then, they explain that more seasoned employees must be prepared for automation by assessing their potential, enrolling in technology seminars, and volunteering for the company's available initiatives. Finally, they note that accountants should be vigilant and actively seek out opportunities to interact with automation technologies, as well as keep abreast of emerging tools and their effective application. The prospect of acquiring so many abilities can be intimidating, but accountants are not expected to be proficient in all the newly necessary areas. Rather, they are expected to be willing to explore, choose, and specialize in those they find most intriguing and promising for the future. (Pholkaew & Yapa, 2017).

Innovation, sales capabilities, communication skills, and other customer-focused resources are expected to be in greater demand. Thus, accountants should strive to acquire these abilities, as they will be better able to adapt to the new digital world (Chiu et al., 2019). As the profession advances,

clients will no longer view their accountant or auditor as a provider of financial statements but rather as someone who has a thorough understanding of their organization and can provide useful insight. Accountants must seize this chance and not let the strain of this less favorable environment stand in their way. It is anticipated that they would be able to convert pressure into motivation, adjusting and grabbing the opportunity to become experts who can intervene in decision-making while orienting themselves towards the business consulting field (Troshani, Locke & Rowbottom, 2019).

As accountants do not grow and seek to expand their abilities in terms of technologies, automation, and data analysis, they will be less competitive in the market. Organizations are already adopting changes and molding their future potential by educating their present staff and hiring new workers with the necessary skills and competences. Due to the fact that the future is hard to predict, however, there will need to be more accounting writers and stakeholders to point businesses and accountants in the right direction.

What is the next aspects of digital accounting?

The transition to digital accounting is analyzed, and the conclusions are grouped into the following digital accounting aspects: Regarding the influence and development of automatisms in the profession, the positive benefits for the profession are indisputable. On the other hand, it can be stated that the information dematerialization procedure was insufficient or ineffective, having no effect on its performance.

Therefore, it is feasible to conclude that the transformation process has stalled due to the limited conditions created by the relevant authorities. It is emphasized that the performance of organs competent authorities for the regulation of accounting in relation to the transition to the digital era is insufficient as it is time-consuming and difficult. Currently, the criteria for a totally digital file are not realized, and the resulting abandonment of the physical support is slowing the progress of dematerialization. It is believed that this occasion should have been utilized to instill the need for change in accountants and other professionals in business, primarily because of the pandemic crisis posed by the COVID-19 virus that society is currently confronting.

It is deemed vital to inculcate in clients due to the growing reliance on client collaboration, both in terms of the dematerialization of information and the necessity for accountants to exhibit higher credibility in their work. Although the conditions for dematerialization are limited, the notion maintains that customers should be informed and encouraged to innovate, as providing fully dematerialized information helps the adoption of automatisms and the subsequent shift to digital accounting. Nevertheless, the complexity and cost of the digital file are acknowledged, as these features of the move to digital accounting can prolong the process. The Thai economy consists primarily of micro and small businesses, which, due to their size, lack the ability or resources to invest in this area.

Regarding automatisms, the conclusion is that there is an indisputable evolution of the theme's conditions, propagation, and impact. In this regard, the government's provision is praised, as it has

paved the way for the automation of some tax returns, resulting in a more dematerialized tax system. The growing complexity of accounting records and tax returns necessitated the development of technical instruments and the associated automation. According to the aforementioned studies, it is now possible for professionals to record motions and transactions throughout time, which would be physically impossible for humans to do and with a significantly smaller margin of error. It was feasible to determine that since they have been exposed to automation tools, the impact has had both professional and personal ramifications, as they are more driven and satisfied with their work. The conclusions are unconcerned about the extinction of the profession due to the emergence of automation since they strive to do field studies and investigate new software in order to gain a competitive advantage in the market.

In order to remain competitive during the shift to digital accounting, accountants are expected to continuously adapt and pursue knowledge innovation. It is argued that accounting education must be reorganized to reflect the needs of contemporary accounting without abandoning traditional teaching techniques, as the need for core principles will be greater than ever. The conclusion is that they should not adjust too rapidly to this new reality, as it is considered that a joint effort is required in which the accountant is not exempt from validating all of the information that the robot holds. In this strategy, Thai accountants must stay up-to-date and try to build a large knowledge base in order to validate the quality of the machine and get the most out of the transfer.

Traditional accountants are generally confident that it will be the future of accounting, demonstrating an ambitious outlook on the prospect of the accounting profession approaching and exploring new areas closer to the client in the future. Given this scenario, there is a higher impetus, as it would be a career with greater status than it already enjoys, given its lack of credence. Accounting has the best chance of establishing itself and showing that it has more value than what society gives it credit for in order to help people grow intellectually and personally.

Conclusion

The notion that accounting standards and their application are necessary and sufficient for the development of high-quality accounting information has been widespread over time. Contrary to the definition of a profession, this notion jeopardizes the position of accountants as professionals and accounting as a profession. Traditional accounting has been stagnant for many years, but with the declining cost of technology systems and their increasing use, their adoption has become nearly mandatory. As a result of the profession's progress, the accountant now has the freedom to intervene and operate in a team, and is beginning to evaluate data. In this way, accountants have assumed a proactive position, focused on business and decision-making help, with a stereotype regarded as more daring, capable of advising and planning strategies, in contrast to the classic accountant, whose stereotype is regarded as boring and conservative. The accountant's role must change in parallel with the digital revolution.

This digital change might create uncertainty in the accounting profession, which can only be interpreted as either new opportunities or threats. Various scholars believe that innovation constitutes a threat to the accounting profession since it will lead to its extinction if accountants are unable to keep up with technological progress. Other studies consider the transformation as an opportunity because it will create employment opportunities and expand the profession. The function of accountants has changed to become more business-oriented, with time-consuming and repetitive duties becoming automated and future accountants performing higher-value work while altering and specializing in more strategic and management areas. In order to distinguish themselves in the market, accountants must specialize in a small number of industries with a promising future and increase their technological abilities.

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