Journal of Infrastructure, Policy and Development 2024, 8(8), 5921.
https://doi.org/10.24294/jipd.v8i8.5921

Article

Navigating the transformation of accountant's roles through digital and environmental challenges

Kanitsorn Terdpaopong, Nimnual Visedsun, Phatnatcha Chotkunakitti*

Faculty of Accountancy, Rangsit University, Pathumthani 12000, Thailand
*** Corresponding author:** Phatnatcha Chotkunakitti, phatnatcha.c@rsu.ac.th

CITATION

Terdpaopong K, Visedsun N, Chotkunakitti P. (2024). Navigating the transformation of accountant's roles through digital and environmental challenges. Journal of Infrastructure, Policy and Development. 8(8): 5921. https://doi.org/10.24294/jipd.v8i8.5921

ARTICLE INFO

Received: 19 April 2024
Accepted: 29 May 2024
Available online: 30 August 2024

Abstract: This research investigates how accountants in Thailand are adapting to changes driven by advances in digital technology, environmental issues, and professional accounting organizations. The study identifies key factors influencing these shifts and assesses their impact on the accounting field. A survey of accountants from large manufacturing firms in Thailand was conducted, examining internal, external, and personal factors affecting their roles and responsibilities. The study uses Structural Equation Modeling (SEM) to analyze data from 174 respondents, identifying leadership and digital technology readiness as internal factors; sustainability force, professional entity, and digital technology force as external factors; and competency skills and attitude as personal factors. The fit indices collectively suggest that the model has a good fit to the data, demonstrated by Comparative Fit Index (CFI) value (0.91), Tucker-Lewis Index (TLI) (0.891), Root Mean Squared Error of Approximation (RMSEA) (0.067), and chi-square/degree of freedom model (1.776). The combination of the indices supports the conclusion that the model is robust and well-aligned with the observed data, and importantly capturing the relationships between the constructs under the study. Results reveal a significant transformation in the professional identity of Thai accountants, primarily driven by their positive attitude towards changes. Notably, professional accounting bodies and educational institutions appear to hinder this evolution. The findings emphasize the need for professional organizations to realign their strategies to better support the evolving roles of accountants.

Keywords: changing roles; accountants; accountants; disruption; digital technology; challenges
JEL Classification: M41; O33; Q56; M12; L84

1. Introduction

Over the past few decades, the accounting profession has undergone significant transformation in its roles and responsibilities. Initially, accountants primarily handled tasks such as bookkeeping, financial transaction recording, reporting, and basic financial analysis to support decision making. However, the rise in digital technology has broadened its responsibilities (Andreassen, 2020). According to a study by Gulin et al. (2019), they expressed their statement that changes in the business environment have led to a shift in accountants' roles, moving away from traditional bookkeeping and reporting toward more strategic and analytical functions. Technology adoption has enabled accountants to automate routine processes and focus on higher-level functions including data analysis, forecasting, and risk management (Jackson et al., 2022). Accountants are essential business partners capable of providing valuable insights for informed decision making (Yigitbasioglu et al., 2023). To deliver meaningful analyses and recommendations, accountants must have a deep

understanding of a company's business goals, strategies, market contexts, and competitive environments. However, a rapidly changing environment may necessitate a shift from a purely technical accounting practice to a more business-oriented approach. Furthermore, changes in accounting rules and responsibilities are driven by shifts in accounting standards. For instance, the adoption of International Financial Reporting Standards (IFRS) demands greater comprehension of complex financial instruments and the ability to exercise judgement and estimation in their roles (Astolfi, 2021). Another significant driver of change in the accounting profession is growing emphasis on sustainability and corporate social activities. KPMG emphasizes the role of accountants in providing assurance and advice on sustainability reporting and identifying opportunities to integrate sustainability into a business strategy (Channuntapipat, 2021).

Many researchers have explored the evolving roles and responsibilities of management accountants (Chenhall and Moers, 2015; Dahal, 2019; Odia, 2019; Varaniūtė et al., 2022). In a systematic literature review, supported by Pasch (2019) and Wolf et al. (2020) find that accountants are increasingly expected to act as strategic partners and assume more prominent roles in decision-making processes. This shift requires a broader skill set, beyond traditional accounting and finance competencies. Essentially, the changing roles and responsibilities of accountants align with broader trends in the business environment, emphasizing automation, data analysis, and strategic thinking. As the corporate landscape continues to evolve, it is likely that accountants' roles will adapt and expand to meet organizational needs. Numerous studies on management accounting stress its pivotal role in fostering organizational development (Visedsun and Terdpaopong, 2021). Research underscores the importance of the performance evaluation process in enhancing ongoing performance, communication, control procedures, and financial outcomes, leading to improved financial indicators and market value. Noteworthy scholars such as Di Vaio et al. (2023), Hopwood, (2019) and Tiron-Tudor and Deliu (2021) have elucidated the significance of the performance assessment process.

It is essential to make challenging decisions during a crisis. The aftermath of COVID-19 brought this reality to the forefront of numerous individuals including CEOs, small business owners, and government officials. Competent accountants play a pivotal role as trusted advisors in times of uncertainty (Leoni et al., 2022; Papadopoulou and Papadopoulou, 2020). Although artificial intelligence (AI) can automate many tasks, human oversight and judgement remain necessary for numerous tasks and decisions. Accountants shifted their roles and responsibilities by directly performing these tasks to monitor and adopt a different approach (Mosteanu and Faccia, 2020). Currently, there are opportunities for reform that could benefit the business world, government agencies, and society. This presents a crucial moment for the accounting profession to further develop existing talent and welcome new recruits that can adapt to this evolving environment (Bowles et al., 2020).

The implementation of this new technology has potential for cost savings and advancements in automated accounting. However, the accounting profession continues to grapple with a shortage of skilled workers (Cohen et al., 2020; Rebele and Pierre, 2019). The extensive use of information technology (IT) in business has transformed the complexity and dynamism of accounting activities driven by

disruptive technology. Recent developments, such as cloud computing, eXtensible Business Reporting Language (XBRL), and business analytics, have reshaped how firms report financial results and make business decisions. As a result, there is a growing demand for advanced competency skills among accounting professionals (Cohen et al., 2020; Di Vaio et al., 2023; Rebele and Pierre, 2019). Therefore, it is imperative to prepare students for accounting studies and provide them with ongoing education to accounting professionals.

One of the global disruptions in 2019 was the outbreak and spread of coronavirus. This event has had a detrimental impact on various industries, leading to the imposition of restrictions and lockdowns in many countries (Haider et al., 2020). Curfews and lockdowns were implemented to prevent people from leaving their residences. In response to government policies aimed at curbing the virus, many jobs transitioned from on-site to online, full-time to part-time, and from office-based to remote work. Accounting professionals have been affected by these changes (Heltzer and Mindak, 2021; Papadopoulou and Papadopoulou, 2020). Hence, it is essential to investigate how accountants' roles and responsibilities have evolved during the pandemic and how they can effectively fulfil their duties in a remote work environment while ensuring regulatory compliance and safeguarding sensitive financial information.

The theoretical framework presented by Rogers in the Diffusion of Innovations Theory (Rogers et al., 2014) lays the groundwork for comprehending the adoption of new digital technologies in the accounting field, particularly focusing on the changing roles of accountants in Thailand. This theory elucidates the dissemination and adoption of innovative accounting methodologies within a social system, shedding light on the technological readiness and digital proficiency of accountants (Rogers et al., 2014). In a comparable way, the Resource-Based View (RBV) of the firm improves this comprehension by stressing the strategic importance of internal capabilities and resources, like digital competencies in accounting, as crucial components for attaining a competitive edge and enhancing organizational performance (Barney, 1991). These internal resources play a vital role in enabling accountants to adjust and excel in the digital age. Additionally, Stakeholder Theory, as introduced by Freeman (1984, 2010) provides a perspective for analyzing the impact of diverse stakeholders, including professional accounting bodies, educational institutions, and senior management, on the roles and duties of accountants. It emphasizes the significance of grasping and managing stakeholder expectations within the evolving landscape of the accounting profession. These theories present a comprehensive framework for evaluating the dynamic shifts in management accounting practices in light of disruptive technological advancements, underlining the significance of innovation adoption, resource capabilities, and stakeholder participation in influencing the future of the profession.

In the context of the rapidly evolving landscape influenced by disruptive technological advancements, this study comprehensively examines the intricate development of roles and responsibilities of accountants in Thailand. At the core of this analysis lie inquiries into the ways in which these roles have adjusted in light of digital transformation, the essential internal capabilities and external factors that have played a crucial role in this progression, and the specific influence of professional

accounting bodies and educational establishments in either facilitating or impeding these adjustments. Within these inquiries, research gaps have been pinpointed, for instance, digital skills among accountants, the significance of professional organizations and academic institutions in this transformative process, and the impact of internal mindsets and external environmental elements on the evolution of the profession. The aim of this investigation is to examine the evolving roles and responsibilities of accountants in Thailand in response to disruptive technological advancements, environmental issues, and the influence of professional accounting organizations. Specifically, the study seeks to pinpoint and examine the main drivers of these shifts, such as digital technology impact, sustainability impact, professional bodies, leadership, digital technology preparedness, competency abilities, and attitudes. This investigation utilizes Structural Equation Modeling (SEM) and collects information via questionnaires from accountants in major manufacturing companies. The study aims to offer valuable perspectives on how these factors collectively shape the evolution of the accounting field, thus presenting practical implications for both professionals and decision-makers.

2. Literature review and hypothesis setting

In recent years, the rapid proliferation of digital technology has brought about significant changes in the accountants' roles and responsibilities (Moll and Yigitbasioglu, 2019). With these technological advancements and higher expectations from the business sector, accountants have increased opportunities to enhance the efficiency of their work and to provide more value to the organizations they serve. Many accountants equipped with these changes were able to complete their tasks in less time, improve the speed and accuracy of their processes, and take on additional responsibilities, which were previously uncommon. Despite these advancements, major barriers may hinder accountants' adaptation (Perkhofer et al., 2019). These include resistance to change and a lack of training and development programs (Perkhofer et al., 2019). Organizations can support the evolution of accountants' roles and responsibilities by investing in new technologies, offering training and development programs, and fostering an innovative and collaborative culture. Effective leadership at the top management level is critical to the success of these initiatives (Lutfi, 2022). Top-level management should provide a clear vision and plan for the organization, allocate resources to support the shifting roles of accountants, actively manage change, encourage collaboration and cross-functional teamwork, and promote the development of new skills and expertise by adopting new technology (Aburahma et al., 2020; Muhammad, 2022).

The attitudes of accountants and employees within the organization are also vital for the evolution of accountants' roles and responsibilities. Accountants should be open to acquiring new skills and technologies and should possess a positive attitude toward change. They should also demonstrate collaboration, flexibility, and innovation in their work approaches. Multiple studies have emphasized the need for accountants and accounting professionals to adapt their roles and responsibilities in response to changing business environments and societal expectations. For instance, a previous study highlighted a positive and significant relationship between

sustainability management and corporate financial performance moderated by firm size (Hernández et al., 2020), with smaller firms experiencing a stronger positive effect than large firms (Lin et al., 2019). Pasch (2019) underscores the importance of management accountants taking on additional responsibilities such as strategic advising and decision-making assistance. Leadership and organizational support for these evolving roles and responsibilities is crucial, particularly in terms of top-level leadership and a supportive culture that emphasizes sustainability, social responsibility, and stakeholder involvement. Roscoe et al. (2019) argue that organizational culture and leadership are key factors in supporting the development and implementation of social and environmental accounting practices.

The impact of technology on the accounting profession is underscored, particularly the need for accountants to acquire new skills and competencies in areas such as data analytics, data visualization, and soft skills such as communication. Although digital technology has the potential to enhance efficiency and productivity, it also presents substantial challenges for accountants, including handling large volumes of data (big data) and balancing traditional accounting practices with new digital tools and techniques (Tiron-Tudor and Deliu, 2021), along with competencies in sustainability reporting and performance monitoring (Tiwari and Khan, 2020).

Accounting standards play a crucial role in shaping financial reporting practices. Schroeder et al. (2022) introduced the positive theory of accounting standards, which argues that accounting standards result from political processes (Pollanen, 2020) and are influenced by stakeholders' interests (Mnif Sellami and Gafsi, 2019). This theory suggests that accounting standards are shaped by the actions of standard-setting bodies and various interest groups including regulators, auditors, and investors.

Several studies have explored the factors influencing management accounting in the context of organizational change. Previous research has found that factors like management support (Almatarneh et al., 2022), employee involvement (Riyanto et al., 2021), and the availability of relevant information (Hariyati et al., 2019) impact the role of management accountants in developing performance measures during organisational change. Accountants can play a significant role in organizational strategy development and implementation; however, this role is often limited by their focus on cost control and compliance (Simons, 2019). The role of accounting in promoting sustainable development has garnered increasing attention in recent years.

The study by Hernández et al. (2020) conducted using the PLS-SEM technique on a sample of 278 Spanish firms confirms that micro and small and medium sized enterprises (MSMEs) that carry out corporate social responsibility (CSR) activities in all three dimensions (economic, social, and environmental) improve their economic performance. The research gap mentioned that while many works have studied the influence of CSR on economic performance in large businesses, very few studies have focused on MSMEs (Sánchez-Infante Hernández et al. 2020). However, several studies also concluded that CSR and ownership structure have a significant negative effect on CSR disclosure (Alia and Mardawi, 2021; Ben Fatma and Chouaibi, 2021; Fahad and Rahman, 2020; Zaid et al., 2019).

Digital technology has profoundly affected the accounting profession. The factors like technology readiness, corporate culture, and leadership support play pivotal roles in driving effective digital transformation (Trushkina et al., 2020).

Additionally, the influence of digital accounting systems on the performance of SMEs and conclude that the adoption of digital accounting systems is positively associated with SMEs' sales and performance (Igwe et al., 2020).

Technological advancements have reshaped the accounting profession by redefining its tasks and roles of accounting professionals. Internet-related technologies have empowered accountants to provide value-added services, including real-time financial reporting and client analysis of their clients (Peng et al., 2023). The adoption of AI-based accounting offers potential benefits such as enhanced accuracy, increased efficiency, and cost savings, but necessitates changes in the tasks and roles of accounting professionals (Lee and Tajudeen, 2020). Big data visualization is a promising technique that can assist accountants in extracting insights from financial data and gaining a deeper understanding of it (Dagilienė and Klovienė, 2019). However, the integration of technology into accounting presents challenges such as the need for ongoing learning and training to keep pace with technological advancements, the complexity of the technology, and the lack of data literacy skills among accounting professionals. Furthermore, the accounting profession has experienced significant, requiring accountants to adapt to remain effective in the rapidly evolving business environment (Moll and Yigitbasioglu, 2019). Compliance with accounting standards is influenced by the actions of standard-setting bodies and various interest groups. Management accountants can play a vital role in the development and implementation of organizational strategies. Additionally, the role of accounting in promoting sustainable development is influenced by internal organizational factors such as culture, values, and top management support (Dhar et al., 2022; Sugiarti et al., 2021). The rise in digital technology has brought about both benefits and challenges for accounting. The successful adoption of digital transformation requires careful consideration of factors such as technological readiness, organizational culture, and leadership support. As the accounting profession undergoes substantial changes, accountants must adapt to remain relevant and effective in the rapidly changing business environment. Organizational support, technological advancements, and stakeholder engagement are essential in preparing, supporting, and helping accountants overcome twenty-first century challenges.

The amalgamation of the Diffusion of Innovations Theory (Rogers et al., 2014), Resource-Based View (RBV) (Barney, 1991), and Stakeholder Theory (Freeman, 1984, 2010) in the context of this research aligns with its aim to examine the shifting roles and responsibilities of accountants in Thailand amidst disruptive technological advancements. Utilizing Rogers' Diffusion of Innovations framework, the study seeks to gain insights into the process by which accountants adopt new digital tools and practices, highlighting the shift towards digital proficiency (Rogers et al., 2014; Damerji and Salimi, 2021). This framework is relevant to understanding the pathways of digital technology readiness (DTR) and its impact on competency skills (CPT) and attitudes (ATT) of accountants. Likewise, the RBV serves as the foundation for investigating the internal competencies and assets that enable accountants to leverage technological advancements for a competitive edge (Barney, 1991). This theory underpins the pathways linking leadership (LDS), digital technology readiness (DTR), and competency skills (CPT), demonstrating how internal resources can drive positive attitudes and adaptability among accountants (Cortellazzo et al., 2019). Stakeholder

Theory further enriches this examination by considering the influence of external factors such as professional organizations and educational establishments on this transition (Freeman, 1984, 2010). It is particularly relevant to the pathways involving the professional entity (PE) and sustainability force (SF), as these external stakeholders significantly shape the roles and responsibilities of accountants through standards, policies, and expectations (Asante-Appiah and Lambert, 2023; Bellucci et al., 2019).

Collectively, these theories not only structure the research's exploration of the changing landscape of accountants but also enhance the understanding of the drivers behind these transformations. The integration of these theoretical perspectives grounds the proposed structural equation modeling (SEM) of the changing roles and responsibilities of accountants, providing a comprehensive framework for analyzing the impact of digital technology, leadership, and external influences.

During a period marked by rapid technological advancement and evolving business models, the roles and responsibilities of accountants in Thailand have undergone significant changes. At the core of our analysis lie the interactions between the adoption of digital technology, the leadership roles within accounting entities, the perceptions of change held by accountants, and their consequent influence on professional responsibilities. We posit a set of hypotheses crafted to untangle the intricate relationships among these factors.

- Hypothesis 1: Digital technology (DT) force positively influences leadership (LDS)—Path A.

In the rapidly evolving business landscape, digital technology has emerged as a critical element for organizational success, profoundly influencing leadership dynamics. The rationale behind this proposition arises from the fact that digital technologies enable more effective processes, real-time data accessibility, and advanced analytics. These advancements in technology provide leaders with powerful tools to make more informed decisions, foster innovation, and improve overall leadership effectiveness. For example, Flyverbom, Deibert, and Matten (2019) point out that the administration of digital technology and big data introduces fresh roles and obligations for business leaders, amplifying their strategic competencies. Additionally, as organizations embrace digital technologies, leaders can utilize these instruments to boost strategic planning and operational efficiency, thereby fortifying their leadership proficiencies (Kokina and Blanchette, 2019).

The causal pathway is clearly defined. The adoption of digital technology leads to increased access to information and analytics, empowering leaders to make better decisions and drive organizational performance. Leaders who accept digital transformation can cultivate a culture of creativity and continual enhancement, establishing a distinct vision for the organization's future and adeptly leading their teams through the intricacies of digital adoption. By facilitating real-time perspectives and streamlining routine tasks, digital technologies enable leaders to focus on strategic initiatives, thereby enhancing their efficiency and impact within the organization. This proposition is well-backed by the literature, which emphasizes the noteworthy effect of digital technology on leadership efficiency and strategic decision-making capabilities (Andreassen, 2020; Flyverbom et al., 2019). Therefore, it is proposed that

the positive impact of digital technology on leadership results in enhanced leadership skills and organizational accomplishments.

- Hypothesis 2: Leadership (LDS) positively influences the digital technology readiness (DTR) of accountants (Path B).

Effective leadership plays a crucial role in enhancing the digital technology readiness of accountants within an organizational context. The rationale behind this proposition lies in the notion that leaders who proactively embrace and advocate for digital technologies can significantly impact their team's readiness to adopt such technologies. By providing essential resources, training, and support, leaders establish the groundwork for digital transformation, fostering not only the uptake of digital tools but also a culture of continual learning and adjustment.

The causal link in this scenario is clear through active backing of digital transformation endeavors, leaders cultivate an atmosphere where accountants feel more self-assured and equipped to utilize digital technologies. This backing can manifest in various ways, such as investing in digital tools, offering access to training schemes, and nurturing an organizational culture that esteems innovation and technological progress. Consequently, accountants acquire the proficiencies necessary to effectively utilize digital technologies in their capacities, thereby heightening their digital technology readiness.

This hypothesis finds substantial support in existing literature. For instance, Dirani et al. (2020) highlights the significance of leadership in guiding organizational changes, particularly in the domain of digital transformation. They posit that leaders who exhibit a clear vision for technology adoption and extend continuous support can notably bolster their team's preparedness for digital shifts. Likewise, Cortellazzo, Bruni, and Zampieri (2019) stress the critical role of leadership in fostering a conducive setting for digital innovation, consequently enhancing digital preparedness among staff members. Thus, we posit that leadership positively impacts the digital technology readiness of accountants, empowering them to adeptly maneuver and excel in a digitally transformed business environment.

- Hypothesis 3: Leadership (LDS) positively influences the attitude (ATT) of accountants (Path C).

The influence of leadership on shaping employees' attitudes towards change and innovation is profound. Leaders who exhibit supportiveness, strong communication, and a visionary approach play a crucial role in inspiring and motivating their teams to adopt new ideas and technologies. Effective leadership establishes the foundation for a positive organizational culture, significantly impacting accountants' readiness to adapt to new circumstances. When leaders actively endorse and promote positive attitudes towards change, they foster an environment where accountants feel valued, supported, and encouraged to engage with new initiatives.

The causal pathway here is evident. A strong and supportive leadership fosters positive attitudes among accountants. Leaders who articulate a distinct vision for the future, supply essential resources and training, and exhibit a commitment to innovation can foster a culture of openness and adaptability. This supportive atmosphere motivates accountants to develop a positive attitude towards their evolving roles and responsibilities, enhancing their willingness to embrace changes in their work practices.

Research presents empirical findings that back this hypothesis, underscoring the pivotal role that leadership plays in promoting organizational change. Dirani et al. (2020) highlights the importance of transformational leadership in molding team attitudes, particularly in times of crisis. They argue that leaders who exhibit transformational qualities can significantly impact their team's openness to change. Moreover, Cortellazzo et al. (2019) underscore the importance of leadership in cultivating an innovative and supportive organizational culture. By offering guidance, resources, and motivation, leaders have the ability to influence the mindset of their employees towards embracing novel technologies and methodologies. Thus, we propose that leadership positively influences the attitude of accountants, making them more receptive and proactive in adapting to new challenges and opportunities.

- Hypothesis 4: Digital technology readiness (DTR) positively influences the competency skills (CPT) of accountants (Path D).

Digital technology readiness plays a crucial role in augmenting the proficiency of accountants. The rationale behind this proposition is rooted in the concept that readiness to adopt and utilize digital technologies equips accountants with essential skills to enhance their performance efficiency. Embracing digital tools allows accountants to leverage these technologies for improving analytical capabilities, refining decision-making processes, and offering strategic insights to their organizations.

The linkage between higher digital technology readiness and the acquisition of competency skills is evident. Accountants who are prepared to embrace digital technologies can more readily cultivate expertise in data analysis, financial forecasting, and risk management, which are increasingly vital in the digital era. This preparedness encompasses not only technical prowess but also the capacity to integrate digital tools into daily accounting practices, thereby enhancing overall performance and organizational value.

This proposition finds robust support in current literature. For instance, Damerji and Salimi (2021) explore how digital technology readiness impacts the adoption of artificial intelligence in accounting, leading to enhanced competency skills among accounting professionals. Similarly, Kokina et al. (2021) underscore that digital proficiency empowers accountants to transition from traditional bookkeeping to strategic advisory roles, underscoring the significance of readiness in cultivating new competencies. Thus, we posit that digital technology readiness positively affects the competency skills of accountants, enabling them to thrive and adapt in an increasingly digitalized business landscape.

- Hypothesis 5: Competency skills (CPT) positively influence the attitude (ATT) of accountants (Path E).

The correlation between competency skills and favorable workplace attitudes is crucial within the realm of managerial accounting. Competency skills denote the capacity of professionals in managerial accounting to efficiently apply their understanding and expertise in various accounting tasks. When professionals in managerial accounting possess elevated levels of proficiency, they are more self-assured in their positions and more inclined to demonstrate a favorable demeanor towards modifications and novel responsibilities. This self-assurance originates from

their capability to manage intricate assignments, make well-informed choices, and contribute significantly to the triumph of the organization.

The causal sequence in this scenario enhanced competency abilities result in a more favorable demeanor among professionals in managerial accounting. Competent accountants are better prepared to adjust to new technologies and methodologies, which subsequently nurtures a more advantageous perspective towards their developing roles. This preparedness and capability to efficiently navigate alterations bolster a favorable demeanor towards continuous enhancement and professional growth.

A vast body of literature substantiates this proposition. For instance, Kokina et al. (2021) deliberate on how proficiency abilities empower professionals in managerial accounting to shift from conventional bookkeeping duties to more strategic advisory responsibilities, which has a favorable influence on their demeanor towards their occupation. Similarly, Asonitou and Hassall (2019) emphasize that cultivating the appropriate competencies not only boosts performance but also enriches job contentment and attitudes towards professional advancement. Hence, we posit that proficiency abilities have a constructive effect on the demeanor of professionals in managerial accounting, rendering them more amenable and proactive in embracing fresh challenges and prospects within their profession.

- Hypothesis 6: There is a positive relation between digital technology force (DT), Leadership (LDS), digital technology readiness (DTR) and competency skills (CPT) towards attitude (ATT) of accountants (Path A + B + D + E).

Comprehending the interaction among diverse elements and their collective impact on the mindsets of financial experts is vital in the current ever-changing business milieu. Digital technology coercion, efficient leadership, digital technology preparedness, and proficiency abilities are interconnected constituents that profoundly influence the mindsets of financial experts. Once these components are harmonized, they generate a harmonious impact that boosts the general demeanor towards modification and novelty within the accountancy occupation.

Incorporates numerous aspects, digital technology furnishes the essential instruments and resources, leadership provides guidance and assistance, digital technology preparedness ensures the capability to embrace these instruments, and proficiency abilities enable efficient utilization. Collectively, these aspects nurture a favorable demeanor among financial experts. For example, when an entity embraces novel digital technologies (DT), supported by robust leadership (LDS) that stresses the significance of these instruments, and when financial experts are eager to welcome these modifications (DTR) and possess the requisite abilities (CPT), their demeanor towards their evolving responsibilities is significantly enriched.

This comprehensive perspective is substantiated by existing literature. Damerji and Salimi (2021) spotlight how digital technology preparedness and adoption influence mindsets towards technological alterations. Cortellazzo et al. (2019) underscore the function of leadership in fostering a encouraging ambiance for innovation, which favorably impacts mindsets. Additionally, Asonitou and Hassall (2019) deliberate on the importance of proficiency abilities in molding favorable professional mindsets. By integrating these perspectives, we propose that there is a positive relation between digital technology force, leadership, digital technology

readiness, and competency skills towards the attitude of accountants, collectively enhancing their adaptability and proactiveness in a digitally transforming landscape.

- Hypothesis 7: There is positive and both direct and indirect effect of attitude (ATT) towards changing roles and responsibilities of accountants (CHR) (Path F)

The attitude of accountants plays a pivotal role in the evolution of their roles and responsibilities. A positive attitude not only directly influences their willingness to embrace new responsibilities but also indirectly impacts their effectiveness and adaptability in these roles. When accountants possess a favorable attitude towards change, they are more likely to proactively engage with new technologies, methodologies, and strategic initiatives, thereby directly enhancing their roles and responsibilities (CHR).

A positive attitude (ATT) encourages accountants to take on new challenges, adopt innovative practices, and continuously improve their skills, leading to a more dynamic and strategic role within their organizations. This direct influence is critical as it immediately affects their day-to-day responsibilities and overall professional development.

Additionally, the indirect effects of a positive attitude are equally significant. A favorable attitude fosters a culture of continuous learning and openness to change, which, in turn, encourages accountants to seek out and utilize new tools and techniques. This ongoing process of adaptation and skill enhancement indirectly strengthens their roles and responsibilities over time. The literature supports this dual impact, with studies highlighting that a positive attitude towards change leads to improved job performance and greater professional growth (Krasodomska et al., 2020; Wolf et al., 2020).

Thus, we propose that there is both a positive direct and indirect effect of attitude towards changing roles and responsibilities of accountants. This dual influence underscores the importance of fostering a positive attitude to ensure that accountants can effectively navigate and thrive in an evolving business environment.

- Hypothesis 8: Digital technology force (DT) directly affects the changing roles of accountants (CHR) (Path G).

The rapid advancement of digital technology is fundamentally transforming the roles of accountants. New and advanced technology like artificial intelligence, big data analytics, and cloud computing assist the ways accountants deal with their data analysis. Digital technology empowers accountants to automate routine processes, analyze real-time data, and support decision-making with enhanced precision and insight.

This transformation follows a clear causal pathway: as organizations implement digital technologies, accountants are required to adapt their roles to leverage these new tools effectively. Digital technology allows accountants to work beyond traditional tasks, instead they can focus more on providing strategic insights that drive business performance and growth. The direct influence of digital technology enables accountants to engage in higher-level functions like financial forecasting, risk management, and strategic planning.

Extensive research supports this hypothesis. Moll and Yigitbasioglu (2019) highlight that digital technologies have revolutionized the accounting profession by enabling accountants to offer real-time financial reporting and strategic analysis.

Similarly, Kokina, Gilleran, and Blanchette (2021) emphasize that digital innovation pushes accountants towards becoming strategic advisors, thus significantly altering their traditional roles. Consequently, we propose that the digital technology force directly affects the changing roles of accountants, steering them towards more strategic and impactful functions within their organizations.

- Hypothesis 9: Digital technology force (DT), attitude (ATT), sustainability force (SF), and professional entity (PE) collectively influence the changing roles of accountants (CHR) (Path A, B, D, E and F).

The convergence of digital technology, positive attitudes, sustainability imperatives, and the influence of professional entities is driving significant changes in the roles of accountants. Each of these forces individually impacts the profession, but their combined effect creates a more comprehensive transformation. Digital technology introduces advanced tools and methodologies, sustainability demands integrate environmental and social considerations into accounting practices, professional entities provide the standards and education necessary to navigate these changes, and a positive attitude enhances the willingness and readiness of accountants to embrace new roles and responsibilities.

The causal pathway here is multifaceted by which digital technology enhances the efficiency and analytical capabilities of accountants, while sustainability forces require them to incorporate environmental and social governance (ESG) metrics into their reporting and advisory functions. Meanwhile, professional entities shape the profession by setting standards, offering certifications, and promoting best practices that align with these new demands. Attitude plays a crucial role in this transformation by influencing accountants' openness and responsiveness to these changes. Together, these forces compel accountants to adopt more strategic and holistic roles within their organizations.

This hypothesis is supported by extensive research. For instance, Flyverbom et al. (2019) discusses how digital technology reshapes business roles, including accounting. Asante-Appiah and Lambert (2023) highlight the critical role of external auditors and accountants in managing ESG risks, emphasizing the influence of sustainability forces. Bellucci et al. (2019) underlines the importance of professional entities in fostering stakeholder engagement and dialogic accounting practices. Additionally, Dirani et al. (2020) emphasizes the importance of a positive attitude in navigating organizational change. Therefore, we propose that digital technology force, attitude, sustainability force, and professional entity collectively influence the changing roles of accountants, driving them towards a more integrated and strategic approach.

Figure 1 illustrates the hypothesized Structural Equation Modeling (SEM) diagrams utilized in this research. This figure illustrates the relationships between various latent variables, including digital technology force (DT), leadership (LDS), digital technology readiness (DTR), competency skills (CPT), attitude (ATT), sustainability force (SF), and professional entity (PE). The paths indicated in the model depict the hypothesized causal and relational connections between these variables, providing a visual representation of the theoretical framework guiding this research.

The influencing factors are developed as latent variables presented in **Figure 1**. Each latent variable is represented by an oval, with arrows indicating the hypothesized relationships between them. The path coefficients associated with each relationship are represented by letters A, B, C, D, E, F, G, H and I, which describe direction of the effect of one latent on another. Model fit indices are also examined to assess the goodness of fit of the structural equation model (Barrett, 2007).

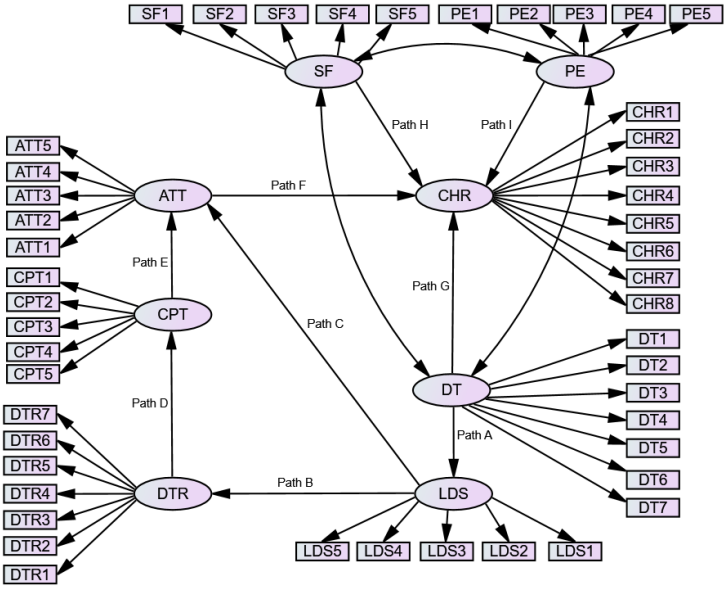

Figure 1. Changing Role (CHR) Model.

Source: Author's drawing.

3. Methodology

3.1. Samples selection

This study aimed to understand the changing roles and responsibilities of accountants, including those of a diverse group of accounting professionals representing various industries and levels of experience. A list of samples is obtained from the EMIS database. By selecting a diverse group of participants, it ensures that the findings are representative and applicable across different sectors of the accounting profession. Only large companies with more than 250 employees are our focus to investigate the impact of these changes on organizations. The preconception that large organizations usually have complex structures and accounting tasks are highly required data-driven to support the management decision (Ding et al., 2020). A list of the top 1,000 large companies is compiled and contacted to participate in this study. The questionnaire is developed to collect comprehensive data on the experiences and perspectives of the participating accounting professionals. A 5-Likert scale (SÜRÜCÜ et al., 2023) is employed to assess the observed items of interest in this study. The questionnaire is tested with a pilot test of 30 participants and a revised questionnaire is administered to the selected participants from the list of large companies. A total of 182 responses is received, and after dropping incomplete data, 174 responses are used to analyze and draw conclusions. The methodology and results of the questionnaire survey are presented and discussed next section.

3.2. Variables

This study focuses primarily on the changing roles and responsibilities of accountants, which serve as dependent variables. In addition, several influencing factors contributing to this transformation, including digital technology force (DT), sustainability forces (SF), professional entity (PE), leadership (LDS), digital technology readiness (DTR), and accountants' competency skills (CPS), are considered as independent variables. The aim of this analysis is to analyze the relationship between these variables. These variables are treated as latent variables in the SEM framework. **Table 1** provides an overview of the variables used in this study. The items under constructs are illustrated in Appendix.

Table 1. Variable list.

No.	Construct	Definition	Factor
1	CHR	Changing roles and responsibilities of accountants—from traditional accountants to business-oriented accountants (Source: Hadid and Al-Sayed, 2021; Moll and Yigitbasioglu, 2019)	Dependent variable
2	SF	Sustainability force: associated with environmental, social, and governance (ESG) (Source: Asante-Appiah and Lambert, 2023; Tsang et al., 2023)	External factor
3	PE	Professional entity: engagement with professional accounting bodies and educational institutions (Source: Adams and Larrinaga, 2019; Bellucci et al., 2019; Carnegie et al., 2021)	External factor
4	DT	Digital technology force (Source: Flyverbom et al., 2019; Kokina and Blanchette, 2019; Moll and Yigitbasioglu, 2019)	External factor
5	LDS	Leadership of the management supporting advanced technology or digital technology (Source: Cortellazzo et al., 2019; Dirani et al., 2020)	Internal factor
6	DTR	Digital technology readiness (Source: Damerji and Salimi, 2021; Moll and Yigitbasioglu, 2019)	Internal factor
7	CPT	Competency skills (Source: Asonitou and Hassall, 2019; Kokina et al., 2021)	Personal factor
8	ATT	Attitude of the responses towards the changing roles (Source: Krasodomska et al., 2020; Wolf et al., 2020)	Personal factor

Source: The authors.

3.3. Methodologies

In this study, latent variables are introduced with three different categories, external factors, internal factors, and personal factors. External factors are those influences that originate outside the organization and impact the accounting profession from the broader business environment. These consist of Sustainability Force (SF), embodying environmental, social, and governance (ESG) elements; Digital Technology Force (DT), which encompasses the adoption and assimilation of digital technologies; and Professional Entity (PE), covering the impact of professional accounting organizations and educational establishments (Adams and Larrinaga, 2019; Bellucci et al., 2019). Internal factors refer to organizational attributes and resources that affect the roles and responsibilities of accountants within the firm. These include Digital Technology Readiness (DTR), which assesses the organization's preparedness to adopt new technologies, and Leadership (LDS), reflecting the support and strategic direction provided by management (Cortellazzo et al., 2019; Dirani et al., 2020). Personal factors are individual characteristics and competencies of the accountants themselves, such as Competency Skills (CPT), which measure the abilities and expertise of accountants, and Attitude (ATT), which gauges their openness and

responsiveness to changes in their roles (Damerji and Salimi, 2021; Kokina et al., 2021).

Given that our participants are accountants, their individual opinions on factors like Sustainability Force (SF), Professional Entity (PE), and Digital Technology Force (DT) may differ significantly, potentially impacting our findings. To tackle this issue, multiple measures were implemented to ensure the results are strong and dependable. We meticulously crafted the survey to reduce prejudice and uncertainty, utilizing established scales from prior studies to uphold uniformity (Damerji and Salimi, 2021; Bellucci et al., 2019). Structural Equation Modeling (SEM) was utilized in this study to examine the connections between the proposed latent variables. This method guarantees that the connections are not solely a result of unique perceptions.

To ensure reliability and internal consistency, the item internal consistency and construct reliability (CR) were assessed using Cronbach's alpha (Nawi et al., 2020) and composite reliability (Sujati and Akhyar, 2020) respectively. A score above 0.7 for both Cronbach's alpha and CR indicates that each test item measured the same latent attribute on the same scale (El-Den et al., 2020). Convergent and discriminant validity were used to evaluate construct validity. Convergent validity was determined by assessing the correlation between items designed to measure the same variable, indicating that items within a construct were linked to the same idea. To demonstrate convergent validity, the average variance extracted (AVE) for each construct should be above 0.5, but lower than its CR (Cheung et al., 2023). On the other hand, discriminant validity focuses on the construct and assesses whether constructs that should not be correlated with each other are unrelated. Convergent and discriminant validity serve as evidence for construct validity in the trinitarian approach to validity (Peeters and Harpe, 2022), with discriminant validity aimed at distinguishing between the measurements of separate constructs. To demonstrate discriminant validity, the square root of each construct's AVE should be greater than its correlation with the other constructs (Rönkkö and Cho, 2022). Furthermore, the structural model is evaluated, and all tests are two-tailed, with statistical significance set at a *p*-value of less than 0.10.

4. Results

4.1. Descriptive information

The descriptive information is summarized in **Table 2** to overview the dataset used in this study. This study includes 174 participants, of whom 24% is male and 76% female. The average working experience of our sample is approximately 19.75 years; 36.8% worked as accountants, 17.8% and 17.2% worked as CFOs and controllers, respectively, and 28.2% worked in other positions. The most common role in the sample is a combination of financial and managerial accounting, representing 56.30 percent of the respondents. 72.90% of the sample organizations was established as limited company. The participants are in the manufacturing sector, 46.60%; 32.20% in service, and 21.30% in retail and wholesale. See **Table 2**.

Table 2. Descriptive information.

Details		Frequency	Percent
Gender	Male	42	24.14
	Female	132	75.86
Experience	Average Years	19.75	
Position	CFO	31	17.80
	Controller	30	17.20
	Accountant	64	36.80
	Auditor & Internal Auditor	9	5.20
	Others	40	23.00
Roles	Financial Accounting and Taxation	58	33.30
	Managerial Accounting	18	10.30
	Both	98	56.30
Firm Type	Company Limited	127	72.90
	Public Company	47	27.00
Industry	Manufacturing	81	46.60
	Retails & Wholesales	37	21.30
	Services	56	32.20
Total		174	100.00

Source: The authors.

4.2. Reliability

Reliability has been widely discussed in literature. The importance of constructing valid and reliable scales to measure psychological constructs is worth noting (Clark and Watson, 2019). The authors provided a comprehensive overview of the basic issues and challenges in scale development, including conceptual clarity, item selection, response format, reliability, and validity. They emphasize the need for a systematic and iterative approach to scale development, with attention to both statistical and conceptual aspects. This study offers practical guidelines and recommendations to researchers to enhance the validity and utility of psychological scales. The reliability of the constructs was evaluated to determine their internal consistency. A construct is considered reliable if its alpha (α) value is greater than 0.70 (Hair et al., 2020). Some observed variables were dropped because they did not meet the criteria, owing to low factor loading. **Table 3** presents the reliability results, including the mean variance, standard deviation, composite reliability (CR), and average variance extracted (AVE). The results revealed that the Changing Roles (CHR) scale of Cronbach's Alpha with four items is 0.90. The Cronbach's Alpha the Digital Technology Readiness (DTR) scale with seven items is 0.95, and the lowest Cronbach's Alpha is the CPT (Competency), scale with three items is 0.76. All of variables satisfy the recommended thresholds of Cronbach's Alpha (≥0.7); AVE (≥0.50) (Cheung et al., 2023; Sujati and Akhyar, 2020) while some variables are not satisfied CR (≥0.70) but are acceptable as the reliability is closed to 0.70 as

recommended (Hair et al., 2020). These variables meet the requirements for the convergent validity of the measurement model.

Table 3. Reliability statistics.

Constructs	No. of Items	Cronbach's Alpha	Means	Variance	STD. Deviation	CR	AVE
CHR	4	0.90	13.20	3.63	0.77	0.71	0.90
SF	5	0.93	27.16	5.21	0.77	0.73	0.93
PE	3	0.82	6.56	2.56	0.77	0.64	0.82
DT	4	0.84	11.97	3.46	0.72	0.60	0.84
LDS	5	0.89	13.95	3.74	0.70	0.61	0.89
DTR	7	0.95	29.49	5.43	0.71	0.69	0.95
CPT	3	0.76	4.09	2.02	0.76	0.64	0.76
ATT	5	0.92	10.90	3.30	0.74	0.69	0.92

Cronbach's alpha ≥ 0.7 (Hair et al., 2013); AVE: Average Variance Extracted ≥ 0.5 (Fernández-Val and Weidner, 2020); CR: Composite Reliability ≥ 0.7 (Hair et al., 2013).
Source: The authors.

Table 4 presents the discriminative validity of the constructs used in this study, illustrated through the inter-correlations between reflective constructs. The diagonal values (in bold) represent the square root of the Average Variance Extracted (AVE) for each construct. The off-diagonal value are the correlations between different constructs. For discriminative validity to be established, each diagonal value must be larger than any of the off-diagonal values in the corresponding row and column.

Table 4. Discriminative validity: Inter-correlation between reflective constructs.

Construct	CHR	SF	PE	DT	LDS	DTR	CPT	ATT
CHR	**0.840**							
SF	0.402	**0.854**						
PE	0.079	0.449	**0.800**					
DT	0.430	0.295	0.190	**0.776**				
LDS	0.301	0.508	0.373	0.301	**0.778**			
DTR	0.365	0.547	0.336	0.242	0.706	**0.827**		
CPT	0.342	0.391	0.271	0.163	0.537	0.659	**0.799**	
ATT	0.491	0.348	0.206	0.151	0.530	0.481	0.423	**0.828**

Source: The authors.

To provide the first sample of interpretation, the diagonal value for Changing Roles and Responsibilities (CHR) is 0.840, which is greater than its correlations with Sustainability Force (SF) at 0.402, Professional Entity (PE) at 0.079, Digital Technology Force (DT) at 0.430, Leadership (LDS) at 0.301, Digital Technology Readiness (DTR) at 0.365, Competency Skills (CPT) at 0.342, and Attitude (ATT) at 0.491. This pattern is consistent across all constructs, where the diagonal value (square root of AVE) for each construct exceeds the respective inter-correlation values.

Moreover, the correlations provide insights into the relationships between constructs. For instance, the correlation between Leadership (LDS) and Digital Technology Readiness (DTR) is 0.706, indicating a strong positive association,

between the two constructs suggesting that effective leadership positively and significantly enhances digital technology readiness of the organizations. Similarly, the correlation between CHR and ATT is 0.491, indicating a moderate positive relationship, which highlights the importance of a positive attitude in adapting to changing roles.

Table 4 confirms that the constructs have good discriminant validity, as evidenced by the diagonal values being larger than the off-diagonal correlations. This table also provides a comprehensive view of the interrelationships among the key constructs, underlining the significant factors driving the evolving roles of accountants in the context of digital transformation and sustainability. See **Table 4**.

The final unstandardized and standardized structural equation models are shown in **Figures 2** and **3**, respectively. Each latent variable, which consists of several observed variables, is presented as an oval. Based on their factor loadings, observed variables are selected for inclusion in the model or removed if it contains low factor loading. Each latent variable exhibit constructs and their path links in the structural model, demonstrating how they are related to one another.

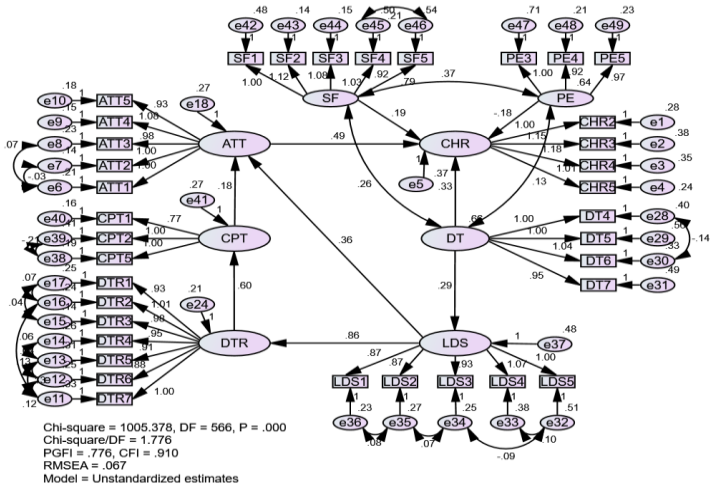

Figure 2. Unstandardized estimates.

Source: The authors.

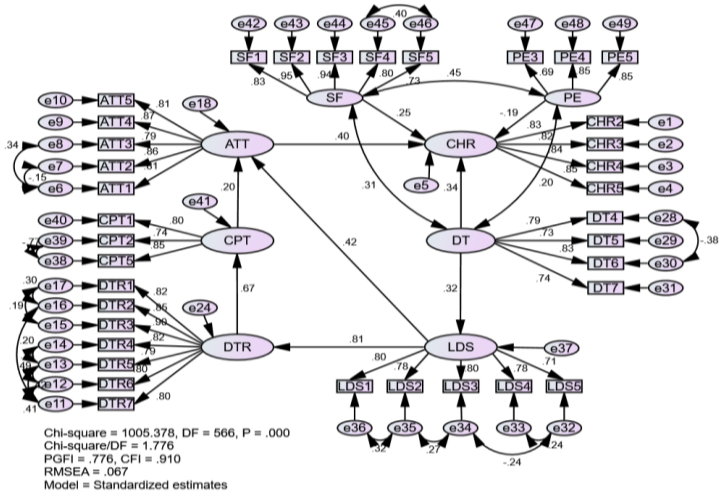

Figure 3. Standardized estimates.

Source: The authors.

Figures 2 and **3** show the SEM images. The model fits well with the data, as indicated by various fit indices such as the Comparative Fit Index (CFI), Tucker-Lewis's index (TLI), and Root Mean Squared Error of Approximation (RMSEA). The chi-squared test result was insignificant, which is one of the requirements for a model with a good fit. The chi-squared/df criterion was 1.776, which was less than 2.000 as required. The CFI is 0.910; ranging from 0.900 to 1.000 is acceptable (Feng and Chen, 2020). The RMSEA, which should be close to 0.0 or lower than 0.05, is 0.067, which is slightly greater than the preference. The PGFI was 0.776, indicating a reasonably good model fit, as values above 0.5 are considered acceptable. The TLI value is 0.891, which falls slightly below the preferred threshold of 0.900, but still indicates an acceptable model fit, given the overall combination of fit indices. These fit indices collectively suggest that the model has a good fit to the data. The slightly lower TLI and higher RMSEA values are mitigated by the strong performance in other indices, such as the CFI and PGFI. The combination of these indices supports the conclusion that the proposed model is robust and well-aligned with the observed data, effectively capturing the relationships between the constructs under study.

Table 5 displays the unstandardized coefficients of the total effects, encompassing direct, indirect, and specified effects. Each cell was labelled with a letter indicating its direction. For example, in the total effects panel, Path A shows that the coefficient for variables DT (digital technology force) and LDS (leadership) is 0.285 ($p < 0.01$). The DT and LDS variables had a direct impact. Considering the indirect effect, the cumulative effect of the A-B path has a coefficient of 0.244 ($p < 0.01$). Some cells exhibited both direct and indirect effects, such as LDS-ATT (Path C), with total effect coefficient 0.458 ($p < 0.01$) and direct effects coefficient of 0.363 ($p < 0.01$) and Path B-D-E with indirect effect coefficient 0.095 ($p < 0.10$), respectively. The Path G had a direct effect with a coefficient of 0.327 ($p < 0.01$), and an indirect effect (Path A-B-D-E-F) with a coefficient of 0.064 ($p < 0.01$). Therefore, this path requires justification because it includes two sub-paths: A-C-F and A-B-D-F-G. The A-C-F path exhibits a stronger indirect effect, with a coefficient of 0.051 (lower and upper coefficients of 0.017 and 0.133, respectively), than the A-B-D-F-F path, which has a coefficient of 0.013 (lower and upper coefficients of 0.002 and 0.051, respectively).

Table 5. Unstandardized coefficients of total effects, direct effects and indirect effects.

Effects/Variables		**PE**	**SF**	**DT**	**LDS**	**DTR**	**CPT**	**ATT**	**CHR**
Total Effects	LDS	0	0	Path A 0.285***	0	0	0	0	0
	DTR	0	0	Path AB 0.244***	Path B 0.857***	0	0	0	0
	CPT	0	0	Path ABD 0.147***	Path BD 0.514***	Path D 0.6***	0	0	0
	ATT	0	0	0.131***	Path C 0.458***	Path DE 0.11*	F 0.184*	0	0
	CHR	Path I −0.181*	Path H 0.193**	Path G 0.391***	0.225***	Path DEF 0.054**	Path EF 0.09*	Path F 0.491***	0
Direct Effects	LDS	0	0	**Path A (H_1) 0.285*****	0	0	0	0	0
	DTR	0	0	0	**Path B (H_2) 0.857*****	0	0	0	0
	CPT	0	0	0	0	**Path D (H_4) 0.6*****	0	0	0
	ATT	0	0	0	**Path C (H_3) 0.363*****	0	**Path E (H_5) 0.184***	0	0
	CHR	Path I −0.181*	Path H 0.193***	**Path G (H_8) 0.327*****	0	0	0	**Path F (H_7) 0.491*****	0
Indirect Effect	LDS	0	0	0	0	0	0	0	0
	DTR	0	0	Path AB 0.244***	0	0	0	0	0
	CPT	0	0	Path ABD 0.147***	BD 0.514***	0	0	0	0
	ATT	0	0	**Path ABDE (H_6) 0.131*****	Path BDE 0.095*	Path DE 0.11	0	0	0
	CHR	0	0	**Path ABDEF (H_9) 0.064*****	BDFG 0.225***	Path DEF 0.054**	Path EF 0.09*	0	0
Defined	Path A-C-F	**Estimate 0.051*****	Lower 0.017	Upper 0.133					
	Path A-B-D-E-F	**Estimate 0.013****	Lower 0.002	Upper 0.051					

p-values *0.10 **0.05 ***0.01 Source: The authors.

5. Discussion

As this study examines the factors that contribute to the changing roles and responsibilities of accountants (CHR), the results show that attitude of the accountants has a substantial beneficial effect on CHR (beta coefficient 0.40, p 0.01). This finding agrees with previous studies (Almatarneh et al., 2022; Dhar et al., 2022; Krasodomska et al., 2020; Sugiarti et al., 2021; Wolf et al., 2020) that found that attitude and leadership are important for the success of organizational change. Furthermore, several constructs illustrated significantly to the changes of roles and responsibilities of accountants. The digital technology force (DT) with beta coefficient of 0.34 is statistically significant (aligned with Flyverbom et al., 2019; Moll and Yigitbasioglu, 2019; Kokina and Blanchette, 2019) and sustainability force (SF) of 0.25 (aligned with Asante-Appiah and Lambert, 2023; Tsang et al., 2023), respectively (p = 0.01) demonstrate that both variables have a favorable effect on CHR. In conclusion, the findings confirm the premise that senior management attitude, digital technology preparedness, and the sustainability force are important predictors of the evolving roles and responsibilities of accountants. However, not all direct effects influence the changing roles and responsibilities of accountants (CHR). A professional entity (PE) was found to have a negative effect on CHR (beta coefficient –0.19, $p > 0.10$). See **Figure 3**.

The indirect effects of leadership (LDS) and competency skills (CPT) on modifying accountants' roles and responsibilities (CHR) were significant through attitude (ATT). The attitude variable contains a beta coefficient of 0.42 ($p < 0.01$), while leadership (LDS) has a greater effect on attitude (ATT) than competency (CPT), which has a beta coefficient of 0.20 ($p < 0.05$). These findings imply that, in addition to direct effects, leadership and competency abilities have indirect effects on changing accountants' tasks and responsibilities via the mediating role of the senior management mindset. The influence of attitude (ATT) was also influenced by the digital technology force (DT). Digital technology (DT) had a significant indirect effect on the changing roles and responsibilities of accountants (CHR) through the mediation of leadership (LDS), with a beta coefficient value of 0.32 ($p < 0.01$), and leadership (LDS) had a strong direct effect on digital technology force (DTR), with a beta coefficient value of 0.81 ($p < 0.01$). This path had a stronger effect than the other paths in the model. See **Figure 3**.

The study's findings suggest that the changing roles and responsibilities of accountants (CHR) are directly influenced by digital technology (DT), sustainability force (SF), leadership (LDS), and attitude (ATT). Additionally, these effects are mediated by digital technology readiness (DTR) and competency skills (CPT). The results also indicate a negative effect of professional entities on changes in accountants' roles and responsibilities, due to their adherence to traditional practices and resistance to change. This study proposes that future research explore ways to overcome this resistance and promote changes in accountants' roles and responsibilities. These results have significant implications for accounting firms and organizations, highlighting the importance of developing senior management support, digital technology readiness, sustainability forces, leadership, and competency skills to facilitate these changes. All hypotheses are confirmed except for Path I which presents

the correlation of PE construct to CHR construct illustrate negative relation. This finding is beyond our initial expectation. In summary, the construct that influence the CHR the most is ATT by which two indirect effect paths are found, firstly DT-LDS-ATT-CHR (Path ACF) and second DT-LDS-DTR-CPT-ATT-CHR (Path ABDEF). **Table 5** presents the poof that Path A-C-F shows the strong coefficient (0.051, *p*-value < 0.01) while Path A-B-D-E-F shows the lesser coefficient (0.013, *p*-value < 0.05).

The findings of this study are consistent with those of previous studies. The studies by Damerji and Salimi (2021) and Moll and Yigitbasioglu (2019) find that digital technology readiness positively influences corporate performance, underscoring the significance of digital technology readiness for accountants. While there may be some existing research on changing roles and responsibilities (CHR) in other countries or regions, this study offers fresh insights into the specific factors that affect roles and responsibility of accountants in Thailand. Furthermore, it sheds light on the negative impact of professional organizations, an aspect that has not been extensively explored in previous studies. Several studies argued that leadership competencies are crucial for navigating digital transformation in the accounting profession (Cortellazzo et al., 2019; Dirani et al., 2020; Trenerry et al., 2021; Weber et al., 2022), which aligns with the findings of this study regarding the indirect effects of leadership on CHR through senior management attitudes. Additionally, the findings are in accordance with the viewpoint that professional organizations may at times hinder change if they cannot keep up with advanced and modern technology. For instance, the advancement of technology like cloud, big data, blockchain, and artificial intelligence (AI) needs to be supported and encouraged by professional bodies (Moll and Yigitbasioglu, 2019). Furthermore, this study underscores the importance of sustainability factors in CHR, a dimension that has not been extensively explored in the literature. Our results align with those of Scarpellini et al. (2020) and Taliento et al. (2019) who proposed that sustainability accounting practices positively impact corporate performance. The support for sustainability factors in the changing roles and responsibility of accountants is significant. This is necessary for accountants to integrate sustainability considerations into their work.

6. Conclusions and recommendations

This study investigates the factors that influence the changing roles and responsibilities of accountants (CHR) in Thailand. The results reveal that senior management attitude is the most influential factor in the changing roles and responsibilities of accountants. This is aligned with several studies (Byrne and Pierce, 2007; Krasodomska et al., 2020; Wilmshurst and Frost, 2000). Digital technology readiness (DT) (Babenko et al., 2019; Walczuch et al., 2007) and sustainability force (SF) (Chiang and Northcott, 2012; Larrinaga-Gonzalez and Bebbington, 2001). were also found to have a positive effect on the changing roles and responsibilities of accountants. Moreover, this study indicated the indirect effects of leadership (LDS) and competency skills (CPT) on the changing roles and responsibilities of accountants through senior management attitudes (Saha et al., 2020; Viator, 2001). This study reveals that digital technology has a significant indirect effect on the changing roles and responsibilities of accountants through leadership (Jung et al., 2008). Conversely,

the study found that professional entities (PE) had a negative effect on the changing roles and responsibilities of accountants (Carnegie and Napier, 2010). These findings suggest the importance of promoting senior management support, digital technology readiness, sustainability forces, leadership, and competency skills to facilitate the changing roles and responsibilities of accountants.

This investigation addresses significant gaps in the scholarly field by clarifying various factors, such as the attitudes of senior management, readiness for digital technology, and competency skills, which determine the changing roles and duties of accountants amid digital transformation and evolving business paradigms. These insights are not only relevant to accountants dealing with similar changes worldwide but also emphasize the importance of leadership and sustainability in managing these transformations. Through its thorough methodology and analytical framework, this study provides a replicable model for scholars interested in examining the dynamic roles of accountants across different national settings, thus expanding the theoretical discussion.

By enriching the Resource-Based View (Barney, 1991), this study contributes to theoretical frameworks by emphasizing the strategic value of digital competence in gaining a competitive edge. It also expands the Diffusion of Innovations Theory (Rogers et al., 2014), outlining the crucial pathway of technological adoption in the accounting field, and enhances Stakeholder Theory (Freeman, 1984, 2010), by highlighting the significant impact of internal and external stakeholders on the profession's development. Additionally, the results illuminate the essential role of leadership in driving change, supporting Transformational Leadership Theory (Jensen et al., 2020; Ting et al., 2021) by showcasing how leadership styles and strategies can greatly influence the adaptability and resilience of accountants.

The findings from this study contributes a notable advancement in comprehending the intricacies of how the accounting profession adapts to contemporary challenges. By outlining the factors that promote or impede the shift to new roles, this study not only progresses academic conversations but also acts as a practical manual for accountants in Thailand and elsewhere. To capitalize on the opportunities presented by disruptive technological advancements, accountants are urged to actively enhance their skills and competencies, thereby confirming their vital role in guiding organizational achievement and sustainability in a changing corporate environment. Organizations need to concern about the strategies and policies that should be placed under the changing environment and ready for the unpredictable future.

The limitations of this study and recommendations for future research point to the potential expanding and improving the understanding of how the roles and responsibilities of accountants are changed. The changes of the roles and responsibilities may be even faster and in a different form due to the changing business environment. Although the current sample size provides valuable insights, a larger and more diverse group of respondents may enhance the generalizability of our findings. Conducting interviews or focus groups is recommended to gain a deeper understanding. The future research could be complemented by exploring a new set of variables, including cultural and industry-specific dimensions. Finally, the long-term

impacts of longitudinal studies may offer a more complete picture of how disruptive changes affect accountants.

Author contributions: Conceptualization, KT, NV and PC; methodology, KT and NV; software, KT; validation, KT and NV; formal analysis, KT, NV and PC; investigation, KT and NV; resource, KT, NV and PC; data curation, KT, NV and PC; writing—original draft, KT; writing—review and editing, KT; visualization, KT, NV and PC; supervision, KT; project administration, KT and PC. All authors have read and agreed to the published version of the manuscript.

Ethical compliance: All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee, the 1964 Helsinki Declaration, and its later amendments or comparable ethical standards. The ethics approval number is DPE No. RSUERB2022-031, granted on 8 March 2022.

Funding: This study received financial support from the Rangsit Research Institute of Thailand, with funding approval number RSU38/2564 granted on 18 April 2022.

Conflict of interest: The authors declare no conflict of interest.

References

Aburahma, I. A., Amuna, Y. M. A., & Aqel, A. M. (2020). The Relationship between GHRM Practices and Organizational Performance" Case study: Gaza University". International Journal of Academic Management Science Research, 4(4).

Adams, C. A., & Larrinaga, C. (2019). Progress: engaging with organisations in pursuit of improved sustainability accounting and performance. Accounting, Auditing & Accountability Journal, 32(8), 2367-2394.

Alia, M. A., & Mardawi, Z. (2021). The impact of ownership structure and board characteristics on corporate social responsibility disclosed by Palestinian companies. Jordan Journal of Business Administration, 17(2).

Almatarneh, Z., Jarah, B. A. F., & Jarrah, M. A. A. (2022). The role of management accounting in the development of supply chain performance in logistics manufacturing companies. Uncertain Supply Chain Management, 10(1), 13–18. https://doi.org/10.5267/j.uscm.2021.10.015

Andreassen, R.-I. (2020). Digital technology and changing roles: a management accountant's dream or nightmare? Journal of Management Control, 31(3), 209–238. https://doi.org/10.1007/s00187-020-00303-2

Asante-Appiah, B., & Lambert, T. A. (2023). The role of the external auditor in managing environmental, social, and governance (ESG) reputation risk. Review of Accounting Studies, 28(4), 2589-2641. https://doi.org/10.1007/s11142-022-09706-z

Asonitou, S., & Hassall, T. (2019). Which skills and competences to develop in accountants in a country in crisis? The International Journal of Management Education, 17(3), 100308. https://doi.org/10.1016/j.ijme.2019.100308

Astolfi, P. (2021). Did the International Financial Reporting Standards Increase the Audit Expectation Gap? An Exploratory Study. Accounting in Europe, 18(2), 166–195. https://doi.org/10.1080/17449480.2020.1865549

Babenko, V., Perevozova, I., Mandych, O., et al. (2019). World informatization in conditions of international globalization: Factors of influence. Global Journal of Environmental Science and Management, 5(Special Issue), 172-179.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Barrett, P. (2007). Structural equation modelling: Adjudging model fit. Personality and Individual Differences, 42(5), 815–824. https://doi.org/10.1016/j.paid.2006.09.018

Bellucci, M., Simoni, L., Acuti, D., et al. (2019). Stakeholder engagement and dialogic accounting. Accounting, Auditing & Accountability Journal, 32(5), 1467–1499. https://doi.org/10.1108/aaaj-09-2017-3158

Ben Fatma, H., & Chouaibi, J. (2021). Corporate governance and CSR disclosure: evidence from European financial institutions. International Journal of Disclosure and Governance, 18(4), 346–361. https://doi.org/10.1057/s41310-021-00117-1

Bowles, M., Ghosh, S., & Thomas, L. (2020). Future-proofing accounting professionals: Ensuring graduate employability and future readiness. Journal of Teaching and Learning for Graduate Employability, 11(1), 1–21. https://doi.org/10.21153/jtlge2020vol11no1art886

Byrne, S., & Pierce, B. (2007). Towards a More Comprehensive Understanding of the Roles of Management Accountants. European Accounting Review, 16(3), 469–498. https://doi.org/10.1080/09638180701507114

Carnegie, G. D., & Napier, C. J. (2010). Traditional accountants and business professionals: Portraying the accounting profession after Enron. Accounting, Organizations and Society, 35(3), 360–376. https://doi.org/10.1016/j.aos.2009.09.002

Carnegie, G., Parker, L., & Tsahuridu, E. (2020). It's 2020: What is Accounting Today? Australian Accounting Review, 31(1), 65–73. Portico. https://doi.org/10.1111/auar.12325

Channuntapipat, C. (2021). Assurance services for sustainability reporting and beyond. Routledge Handbook of Environmental Accounting, 125–136. https://doi.org/10.4324/9780367152369-11

Chenhall, R. H., & Moers, F. (2015). The role of innovation in the evolution of management accounting and its integration into management control. Accounting, Organizations and Society, 47, 1–13. https://doi.org/10.1016/j.aos.2015.10.002

Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., et al. (2023). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. Asia Pacific Journal of Management. https://doi.org/10.1007/s10490-023-09871-y

Chiang, C., & Northcott, D. (2012). Financial auditors and environmental matters: drivers of change to current practices. Journal of Accounting & Organizational Change, 8(3), 340–363. https://doi.org/10.1108/18325911211258335

Clark, L. A., & Watson, D. (2019). Constructing validity: New developments in creating objective measuring instruments. Psychological Assessment, 31(12), 1412–1427. https://doi.org/10.1037/pas0000626

Cohen, J. R., Dalton, D. W., Holder-Webb, L. L., et al. (2018). An Analysis of Glass Ceiling Perceptions in the Accounting Profession. Journal of Business Ethics, 164(1), 17–38. https://doi.org/10.1007/s10551-018-4054-4

Cortellazzo, L., Bruni, E., & Zampieri, R. (2019). The Role of Leadership in a Digitalized World: A Review. Frontiers in Psychology, 10. https://doi.org/10.3389/fpsyg.2019.01938

Dagilienė, L., & Klovienė, L. (2019). Motivation to use big data and big data analytics in external auditing. Managerial Auditing Journal, 34(7), 750–782. https://doi.org/10.1108/maj-01-2018-1773

Dahal, R. K. (2019). Changing role of management accounting in 21st Century. Review of Public Administration and Management, 7(3), 1-8.

Damerji, H., & Salimi, A. (2021). Mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting. Accounting Education, 30(2), 107–130. https://doi.org/10.1080/09639284.2021.1872035

Dhar, B. K., Sarkar, S. M., & Ayittey, F. K. (2021). Impact of social responsibility disclosure between implementation of green accounting and sustainable development: A study on heavily polluting companies in Bangladesh. Corporate Social Responsibility and Environmental Management, 29(1), 71–78. Portico. https://doi.org/10.1002/csr.2174

Di Vaio, A., Hasan, S., Palladino, R., et al. (2023). The transition towards circular economy and waste within accounting and accountability models: a systematic literature review and conceptual framework. Environment, Development and Sustainability, 25(1), 734–810. https://doi.org/10.1007/s10668-021-02078-5

Ding, R.-X., Palomares, I., Wang, X., et al. (2020). Large-Scale decision-making: Characterization, taxonomy, challenges and future directions from an Artificial Intelligence and applications perspective. Information Fusion, 59, 84–102. https://doi.org/10.1016/j.inffus.2020.01.006

Dirani, K. M., Abadi, M., Alizadeh, A., et al. (2020). Leadership competencies and the essential role of human resource development in times of crisis: a response to Covid-19 pandemic. Human Resource Development International, 23(4), 380–394. https://doi.org/10.1080/13678868.2020.1780078

El-Den, S., Schneider, C., Mirzaei, A., et al. (2020). How to measure a latent construct: Psychometric principles for the development and validation of measurement instruments. International Journal of Pharmacy Practice, 28(4), 326–336. https://doi.org/10.1111/ijpp.12600

Fahad, P., & Rahman, P. M. (2020). Impact of corporate governance on CSR disclosure. International Journal of Disclosure and Governance, 17(2–3), 155–167. https://doi.org/10.1057/s41310-020-00082-1

Feng, B., & Chen, M. (2020). The Impact of Entrepreneurial Passion on Psychology and Behavior of Entrepreneurs. Frontiers in Psychology, 11. https://doi.org/10.3389/fpsyg.2020.01733

Flyverbom, M., Deibert, R., & Matten, D. (2017). The Governance of Digital Technology, Big Data, and the Internet: New Roles and Responsibilities for Business. Business & Society, 58(1), 3–19. https://doi.org/10.1177/0007650317727540

Freeman, R. E. (1984). Strategic management: A stakeholder approach. Pitman.

Freeman, R. E. (2010). Strategic management: A stakeholder approach. Cambridge university press.

Gulin, D., Hladika, M., & Valenta, I. (2019). Digitalization and the Challenges for the Accounting Profession. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3492237

Hadid, W., & Al-Sayed, M. (2021). Management accountants and strategic management accounting: The role of organizational culture and information systems. Management Accounting Research, 50, 100725. https://doi.org/10.1016/j.mar.2020.100725

Haider, N., Osman, A. Y., Gadzekpo, A., et al. (2020). Lockdown measures in response to COVID-19 in nine sub-Saharan African countries. BMJ Global Health, 5(10), e003319. https://doi.org/10.1136/bmjgh-2020-003319

Hair, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. Journal of Business Research, 109, 101–110. https://doi.org/10.1016/j.jbusres.2019.11.069

Hariyati, H., Tjahjadi, B., & Soewarno, N. (2019). The mediating effect of intellectual capital, management accounting information systems, internal process performance, and customer performance. International Journal of Productivity and Performance Management, 68(7), 1250–1271. https://doi.org/10.1108/ijppm-02-2018-0049

Heltzer, W., & Mindak, M. (2021). COVID-19 and the accounting profession. journal of accounting, ethics & public policy, 22(2). https://doi.org/10.60154/jaepp.2021.v22n2p151

Hernández, J. P. S. I., Yañez-Araque, B., & Moreno-García, J. (2020). Moderating effect of firm size on the influence of corporate social responsibility in the economic performance of micro-, small-and medium-sized enterprises. Technological Forecasting and Social Change, 151, 119774.

Hopwood, A. G. (2019). Accounting and organisation change. In: Management Control Theory. Routledge.

Igwe, S. R., Ebenuwa, A., & Idenedo, O. W. (2020). Technology adoption and sales performance of manufacturing small and medium enterprises in port harcourt. Journal of Marketing, 5(1), 44-59.

Jackson, D., Michelson, G., & Munir, R. (2022). New technology and desired skills of early career accountants. Pacific Accounting Review, 34(4), 548–568. https://doi.org/10.1108/par-04-2021-0045

Jensen, M., Potočnik, K., & Chaudhry, S. (2020). A mixed-methods study of CEO transformational leadership and firm performance. European Management Journal, 38(6), 836–845. https://doi.org/10.1016/j.emj.2020.05.004

Jung, D. (Don), Wu, A., & Chow, C. W. (2008). Towards understanding the direct and indirect effects of CEOs' transformational leadership on firm innovation. The Leadership Quarterly, 19(5), 582–594. https://doi.org/10.1016/j.leaqua.2008.07.007

Kokina, J., & Blanchette, S. (2019). Early evidence of digital labor in accounting: Innovation with Robotic Process Automation. International Journal of Accounting Information Systems, 35, 100431. https://doi.org/10.1016/j.accinf.2019.100431

Kokina, J., Gilleran, R., Blanchette, S., et al. (2020). Accountant as Digital Innovator: Roles and Competencies in the Age of Automation. Accounting Horizons, 35(1), 153–184. https://doi.org/10.2308/horizons-19-145

Krasodomska, J., Michalak, J., & Świetla, K. (2020). Directive 2014/95/EU. Meditari Accountancy Research, 28(5), 751–779. https://doi.org/10.1108/medar-06-2019-0504

Larrinaga-Gonzalez, C., & Bebbington, J. (2001). Accounting change or institutional appropriation—A case study of the implementation of environmental accounting. Critical Perspectives on Accounting, 12(3), 269–292. https://doi.org/10.1006/cpac.2000.0433

Lee, C. S., & Tajudeen, F. P. (2020). Usage and Impact of Artificial Intelligence on Accounting: 213 Evidence from Malaysian Organisations. Asian Journal of Business and Accounting, 13(1), 213–240. https://doi.org/10.22452/ajba.vol13no1.8

Leoni, G., Lai, A., Stacchezzini, R., et al. (2021). The pervasive role of accounting and accountability during the COVID-19 emergency. Accounting, Auditing & Accountability Journal, 35(1), 1–19. https://doi.org/10.1108/aaaj-10-2021-5493

Lin, W.-L., Cheah, J.-H., Azali, M., et al. (2019). Does firm size matter? Evidence on the impact of the green innovation strategy on corporate financial performance in the automotive sector. Journal of Cleaner Production, 229, 974–988. https://doi.org/10.1016/j.jclepro.2019.04.214

Lutfi, A. (2022). Factors Influencing the Continuance Intention to Use Accounting Information System in Jordanian SMEs from the Perspectives of UTAUT: Top Management Support and Self-Efficacy as Predictor Factors. Economies, 10(4), 75. https://doi.org/10.3390/economies10040075

Mnif Sellami, Y., & Gafsi, Y. (2017). Institutional and Economic Factors Affecting the Adoption of International Public Sector Accounting Standards. International Journal of Public Administration, 42(2), 119–131. https://doi.org/10.1080/01900692.2017.1405444

Moll, J., & Yigitbasioglu, O. (2019). The role of internet-related technologies in shaping the work of accountants: New directions for accounting research. The British Accounting Review, 51(6), 100833. https://doi.org/10.1016/j.bar.2019.04.002

Mosteanu, N. R., & Faccia, A. (2020). Digital systems and new challenges of financial management–FinTech, XBRL, blockchain and cryptocurrencies. Quality–Access to Success, 21(174), 159-166.

Muhammad, S. (2022). Practice of Human Resource planning in organizations: A study based on organizational performance. KASBIT Business Journal, 15(2).

Nawi, F. A. M., Tambi, A. M. A., Samat, M. F., & Mustapha, W. M. W. (2020). A review on the internal consistency of a scale: the empirical example of the influence of human capital investment on Malcom Baldridge quality principles in TVET institutions. Asian People Journal (APJ), 3(1), 19-29.

Odia, J. (2019). Towards a Changing Role of Management Accounting and Management Accountants in Nigeria. Journal of Accounting & Management, 9(1), 2284-9459.

Papadopoulou, S., & Papadopoulou, M. (2020). The accounting profession amidst the COVID-19 pandemic. International Journal of Accounting and Financial Reporting, 10(2), 39-59.

Pasch, T. (2019). Strategy and innovation: the mediating role of management accountants and management accounting systems' use. Journal of Management Control, 30(2), 213-246.

Peeters, M. J., & Harpe, S. E. (2022). Contemporary conceptualization of measurement validity. Contemporary Research Methods in Pharmacy and Health Services, 575–582. https://doi.org/10.1016/b978-0-323-91888-6.00020-x

Peng, Y., Ahmad, S. F., Ahmad, A. Y. B., et al. (2023). Riding the waves of artificial intelligence in advancing accounting and its implications for sustainable development goals. Sustainability, 15(19), 14165.

Perkhofer, L. M., Hofer, P., Walchshofer, C., et al. (2019). Interactive visualization of big data in the field of accounting: A survey of current practice and potential barriers for adoption. Journal of Applied Accounting Research, 20(4), 497-525.

Pollanen, R. M. (2020). Public Sector Accounting Standards Conundrum in Canada and United States: National VS International Standards. International Journal of Business, Accounting, & Finance, 14(1).

Rebele, J. E., & Pierre, E. K. S. (2019). A commentary on learning objectives for accounting education programs: The importance of soft skills and technical knowledge. Journal of Accounting Education, 48, 71-79.

Riyanto, S., Endri, E., & Herlisha, N. (2021). Effect of work motivation and job satisfaction on employee performance: Mediating role of employee engagement. Problems and Perspectives in Management, 19(3), 162.

Rogers, E. M., Singhal, A., & Quinlan, M. M. (2014). Diffusion of innovations. In: An integrated approach to communication theory and research. Routledge.

Rönkkö, M., & Cho, E. (2022). An updated guideline for assessing discriminant validity. Organizational Research Methods, 25(1), 6-14.

Roscoe, S., Subramanian, N., Jabbour, C. J., & Chong, T. (2019). Green human resource management and the enablers of green organisational culture: Enhancing a firm's environmental performance for sustainable development. Business Strategy and the Environment, 28(5), 737-749.

Saha, R., Shashi, Cerchione, R., Singh, R., et al. (2019). Effect of ethical leadership and corporate social responsibility on firm performance: A systematic review. Corporate Social Responsibility and Environmental Management, 27(2), 409–429. Portico. https://doi.org/10.1002/csr.1824

Sánchez-Infante Hernández, J. P., Yañez-Araque, B., & Moreno-García, J. (2020). Moderating effect of firm size on the influence of corporate social responsibility in the economic performance of micro-, small- and medium-sized enterprises. Technological Forecasting and Social Change, 151, 119774. https://doi.org/10.1016/j.techfore.2019.119774

Scarpellini, S., Marín-Vinuesa, L. M., Aranda-Usón, A., & Portillo-Tarragona, P. (2020). Dynamic capabilities and environmental accounting for the circular economy in businesses. Sustainability Accounting, Management and Policy Journal, 11(7), 1129-1158.

Schroeder, R. G., Clark, M. W., & Cathey, J. M. (2022). Financial accounting theory and analysis: text and cases. John Wiley & Sons.

Simons, R. (2019). The role of management control systems in creating competitive advantage: new perspectives—Management Control Theory. Routledge.

Sugiarti, E., Finatariani, E., & Rahman, Y. T. (2021). Earning Cultural Values as A Strategic Step to Improve Employee Performance. Scientific Journal of Reflection: Economic, Accounting, Management and Business, 4(1), 221-230.

Sujati, H., & Akhyar, M. (2020). Testing the construct validity and reliability of curiosity scale using confirmatory factor analysis. Journal of Educational and Social Research, 20(4).

Sürücü, L., Şeşen, H., & Maslakçı, A. (2023). Regression, Mediation/Moderation, and Structural Equation Modeling with SPSS, AMOS, and PROCESS Macro. Livre de Lyon.

Taliento, M., Favino, C., & Netti, A. (2019). Impact of environmental, social, and governance information on economic performance: Evidence of a corporate 'sustainability advantage'from Europe. Sustainability, 11(6), 1738.

Ting, I. W. K., Sui, H. J., Kweh, Q. L., & Nawanir, G. (2021). Knowledge management and firm innovative performance with the moderating role of transformational leadership. Journal of Knowledge Management, 25(8), 2115-2140.

Tiron-Tudor, A., & Deliu, D. (2021). Big data's disruptive effect on job profiles: Management accountants' case study. Journal of Risk and Financial Management, 14(8), 376.

Tiwari, K., & Khan, M. S. (2020). Sustainability accounting and reporting in the industry 4.0. Journal of cleaner production, 258, 120783.

Trenerry, B., Chng, S., Wang, Y., et al. (2021). Preparing workplaces for digital transformation: An integrative review and framework of multi-level factors. Frontiers in psychology, 822.

Trushkina, N., Abazov, R., Rynkevych, N., & Bakhautdinova, G. (2020). Digital transformation of organizational culture under conditions of the information economy. Virtual Economics, 3(1), 7-38.

Tsang, A., Frost, T., & Cao, H. (2023). Environmental, social, and governance (ESG) disclosure: A literature review. The British Accounting Review, 55(1), 101149.

Varaniūtė, V., Žičkutė, I., & Žandaravičiūtė, A. (2022). The changing role of management accounting in product development: directions to digitalization, sustainability, and circularity. Sustainability, 14(8), 4740.

Viator, R. E. (2001). The relevance of transformational leadership to nontraditional accounting services: Information systems assurance and business consulting. Journal of Information Systems, 15(2), 99-125.

Visedsun, N., & Terdpaopong, K. (2021). The effects of the strategy and goal on business performance as mediated by management accounting systems. Economies, 9(4), 149.

Walczuch, R., Lemmink, J., & Streukens, S. (2007). The effect of service employees' technology readiness on technology acceptance. Information & management, 44(2), 206-215.

Weber, E., Büttgen, M., & Bartsch, S. (2022). How to take employees on the digital transformation journey: An experimental study on complementary leadership behaviors in managing organizational change. Journal of Business Research, 143, 225-238.

Wilmshurst, T. D., & Frost, G. R. (2000). Corporate environmental reporting: A test of legitimacy theory. Accounting, Auditing & Accountability Journal, 13(1), 10-26.

Wolf, T., Kuttner, M., Feldbauer-Durstmüller, B., & Mitter, C. (2020). What we know about management accountants' changing identities and roles–a systematic literature review. Journal of Accounting & Organizational Change, 16(3), 311-347.

Yigitbasioglu, O., Green, P., & Cheung, M. Y. D. (2023). Digital transformation and accountants as advisors. Accounting, Auditing & Accountability Journal, 36(1), 209-237.

Zaid, M. A., Wang, M., & Abuhijleh, S. T. (2019). The effect of corporate governance practices on corporate social responsibility disclosure: Evidence from Palestine. Journal of Global Responsibility, 10(2), 134-160.

Appendix

Table A1. Descriptive construct.

Latent	Items
CHR	Opinion was asked to assist with decisions about operations, investments or financing by the Executive Committee or CEO
	Additional information was frequently asked by the Executive
	Additional comments that are more relevant to their decision-making was asked
	Your roles and responsibilities are now more relevant to data analysis and forecasting of future data
	Your organization's expectations or needs increase beyond providing or providing financial information.
	You are demanded to acquire digital technology skills and other new skills
	Your role and responsibilities covers all resource management in the organization, not limited to financial resources only.
	Your role and responsibilities extend to creating value for your customers and other stakeholders of the organization.
SF	Your business is investing in the Environmental, Social, and Governance (ESG)
	To what extent does your entity comply with ESG
	Your entity can maintain ESG data to the same high-quality standards as financial data.
	To what extent does your entity publicly report sustainability information?
	To what level your firm utilizes the disclosure and comparability of sustainable business information in the meeting.
PE	What is the frequency level of communication between professional associations and stakeholders?
	How often the professional associations provide training courses to assist accountants' professional skills?
	The level of current collaboration between professional accounting association and university?
	The level of new graduated staff's competency regarding information technology (IT) in your opinion?
	The level of competency of newly graduated staff regarding critical thinking/critical analysis?
DT	Digital technology makes your roles and responsibilities need to change.
	To what extent does 5G affect your role and responsibilities
	To what extent does IoT—Internet of Things affect your role and responsibilities
	To what extent does AI—Artificial Intelligence affect your role and responsibilities
	To what extent does Block Chain affect your role and responsibilities
	To what extent does Cloud Business Platform affect your role and responsibilities
	To what extent does New Operation System affect your role and responsibilities
LDS	Leaders of your organization support the use of technology.
	Leaders of your organization understand and can use technology professionally.
	Leaders of your organization use technology for communication regularly (not old fashion)
	Your company supports online training both on and offsite on the use of innovative software
	Your company has introduced new software both operations and analysis, such as Proactive Monitoring, Data Visualization, Graphs & Charts, Data Modeling, Integrations, etc.
DTR	In your organization, the number of computers, printers and other technological equipment is sufficient and of good quality.
	In your organization, the current model of computers, printers, and other equipment is up to date.
	In your organization, necessary software is in use and sufficient to the work requirements.
	The internet network is strong and reliable
	There is a data warehouse system in the organization.
	There is data security in place in your organization
	In your organization, software for data analytics is in place.
CPT	You use Office Processor (Word, Excel, PowerPoint) and email regularly.

	You use social media such as Facebook, Line, IG, or WhatsApp regularly.
	You purchase products or services online via websites or other means.
	You communicate via applications such as Zoom, WebEx, and Google meet regularly.
	You use off-the-shelf accounting software package such as SAP, ORACLE or other accounting software package regularly.
	You can analyze data using an excel spreadsheet and provide presentations with competency
	You use analytical statistic software such as SPSS, EVIEW, STATA or other software with competency.
	You use big data from cloud for data analysis and use software such as Tableau, Power BI, or other software.
ATT	How comfortable do you feel to be more involved with senior management?
	How comfortable do you feel to learn new technologies to prepare for more role changes?
	How comfortable do you feel if you need to present an in-depth analysis to senior management?
	How comfortable will you feel if you have to work remotely using technology for communication?
	How comfortable do you feel if you need to learn soft skills in order to develop and work efficiently with others?

Source: Collected and written by authors.