Digital Trends in the Accounting Profession

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Abstract: *The rapid technological changes have profoundly affected the accounting profession. This study aims to systematically explore how digital technology is influencing accounting, examining the forces driving this change. It also investigates crucial educational adaptations needed for future accountants to navigate the evolving technological landscape. The research examines various aspects, including the complex relationship between the accounting profession and global technological changes, the evolving role of technology in accounting, and the necessary adjustments required in accounting education. Through a literature review methodology, the findings highlight a compelling need for a fundamental shift in accounting practices. This transformative process is gradually related within the profession, emphasizing the certain impact of continuous evolution in the accounting field on accounting education. In summary, while technological advances reshape specific aspects of accounting, the discipline's foundational principles persist.*

1. INTRODUCTION

The accounting profession is often correlated to the language of business, reflecting the way people think and operate in the financial world (Žager et al., 2016). Despite the accounting profession's renowned traditions and firmly established principles, it is not immune to change within our modern, globally interconnected business environment. This transformation is driven by the convergence of more rigorous regulatory frameworks and a profusion of technological innovations that are fundamentally reshaping the profession. These challenges are manifesting in the necessity for swift adaptation and transformation of business practices and processes, all while ensuring that the fundamental accounting rules and principles remain at the core of the profession (Gulin et al., 2019). In the fields of accounting and auditing, the concept of prudence in decision-making has long been considered a vital aspect of professionalism. Individuals like managers, auditors, financial analysts, accountants, and standard-setters are responsible for making crucial judgments and decisions. Accountants and managers often choose accounting methods and make decisions that align with their objectives, particularly in the production of accounting information. Within organizations, accountants are concerned with the precision of accounting policies and estimates, while auditors focus on ensuring the accuracy of the provided accounting information (Mala & Chand, 2015).

Traditional accounting has primarily relied on historical cost conventions, emphasizing past and somewhat present business performance while neglecting the future (Hales, 2018). However, modern business places great importance on the future, and this shift in thinking is expected to bring significant changes to the accounting profession in the next three decades (Islam, 2017). These anticipated changes in the accounting profession will be driven by three key factors: the integration of digital, smart, and intelligent technologies; the globalization of reporting standards and the introduction of new regulatory approaches; and the major challenges that the profession will confront (Islam, 2017). Association of Chartered Certified Accountants (ACCA) research—Drivers of Change and Future Skills—has explored these important changes, expected

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to be encountered by the year 2025. Founded in 1904, ACCA is an authority on the profession, but even this organization remains unsure about the exact nature of accounting's future. The organization has repeatedly stressed the need for accountants to future-proof their livelihoods by keeping an eye on the horizon (Galarza, 2017). Routine tasks like bookkeeping and process-driven auditing are becoming increasingly automated, creating space for accountants to focus on non-routine aspects such as tax and business strategies. Technological innovation presents both opportunities and challenges for accountants, necessitating their preparedness for this evolving landscape (Galarza, 2017). The accounting profession is facing potential challenges due to the rapid advancement of technology, as highlighted by Malviya and Lal (2022). As new technologies emerge, it becomes imperative to acquire fresh skills for professional adaptation and success. Consequently, this paper aims to investigate how the profession is transforming in response to current technology trends, framing the following research questions (RQ):

RQ1: How is technology reshaping accounting, and what drives this change?

RQ2: What educational adaptations are essential for preparing future professionals to navigate the evolving technological landscape in the field of accounting?

The primary objective of this paper is to systematically examine and analyze the significant changes in the accounting profession resulting from digitalization. This research is based on a comprehensive review of relevant professional and academic literature. The paper is organized into five main sections. The initial section serves as the introduction, setting the context for the study. The second section is the literature review, providing a thorough overview of existing knowledge in this field. The third section outlines the methodology employed in this research. The fourth section of the paper focuses on clarifying the impact of digitalization on accountants' roles and responsibilities, along with an exploration of the key digital solutions available to accountants in this evolving landscape. Furthermore, within the fourth section, a comprehensive elucidation of essential adaptations to accounting education is provided. Lastly, the paper concludes by summarizing the main findings and acknowledging the research's limitations. Additionally, it suggests potential directions for future research in this area.

2. LITERATURE REVIEW

Many jobs traditionally performed by humans are at risk of being replaced by automation. Frey and Osborne (2013) indicated that slightly less than half of the jobs in the United States face the risk of redundancy due to digitalization, as robots can handle not only routine tasks but also sophisticated ones. While the digitalization era presents opportunities for those who embrace it, it also poses considerable challenges to traditional professions, including accounting. According to Kumar (2018), the accounting industry is undergoing significant digital transformation and is poised for further growth. Similar to numerous other industries, it is adapting to the changing landscape driven by digital technologies.

Technology has significantly transformed the field of accounting. In the past, accountants relied on physical ledger books or ordinary hardbound books with neatly drawn T-shaped lines created using a ruler. Manual calculations or electronic calculators were used for computations. However, over time, software developers introduced accounting software that automated a significant portion of accounting tasks. This automation greatly enhanced the accuracy of financial reports. Due to technological advancements, many companies are undergoing restructuring

to eliminate administrative roles and are increasingly adopting artificial intelligence (AI) for managing accounts payable and receivable (Malviya & Lal, 2022). As a result, the next generation of accountants must possess a comprehensive understanding of business operations, not limited solely to the functions of the accounting department.

Vetter (2018) suggests four key strategies for accountants to remain relevant in the age of technology. The first strategy highlights the significance of adopting cloud computing in accounting, recognizing that much of the future data will reside in the cloud. This move enhances data management efficiency and accessibility to resources. The second strategy emphasizes understanding automation as artificial intelligence becomes more prevalent in routine accounting tasks. Accountants must comprehend automation technologies and their implications. The third strategy stresses the consideration of cryptocurrency and blockchain technologies, which have a potential influence on financial markets. Lastly, the fourth strategy underscores the importance of continuous learning and communication for accountants, given the rapid technological evolution. To remain agile in this changing landscape, accountants must prioritize ongoing learning and effective communication within their professional networks, as complacency in knowledge and skills can be detrimental as technology evolves.

In the contemporary professional landscape, accountants are expected to possess proficiency in areas such as business transformation, digital strategy, and innovation to effectively embrace the digital era (Kokina & Blanchette, 2019; Mosteanu & Faccia, 2020). Accounting practices profoundly depend on technology (Junger da Silva et al., 2020), enabling accountants to perform precise calculations. To maintain their employability, accountants must enhance their skill set and adapt to evolving technological advancements (Kruskopf et al., 2020).

The rapid advancement of technology offers significant opportunities to enhance work efficiency, but it also presents challenges, especially for professionals like accountants, in adapting to digital technology (Ghani & Muhammad, 2019). Despite the growth of digital-based and artificial intelligence-driven businesses, the need for accountants' professional judgment remains critical to ensure compliance with standards in transaction recording. As these technological changes are disclosed, accountants have the potential to evolve into valuable business advisors, emphasizing their role as effective communicators (Solikhatun et al., 2023). To thrive in this evolving landscape, accountants should be prepared to meet future challenges, including technical knowledge, adaptability, learning abilities, a positive mindset, and resilience (Jackson et al., 2020). This shift positions accountants as integral partners in a company's main support system, moving away from the traditional perception of a back-office role (Solikhatun et al., 2023).

According to Frey and Osborne (2013), technological advancement is expected to affect a variety of job positions. The Internet of Things (IoT) has led to changes in accounting and accountability practices within companies (Arnaboldi et al., 2017). Although it doesn't directly alter the fundamental nature of accounting, IoT influences the accounting field in three ways: affecting reporting and disclosure standards, introducing new forms of regulation, and potentially challenging the role of accountants (Islam, 2017). Moreover, IoT is transitioning business models from manual to automatic, impacting the roles of accounting professionals. Accountants now use AI and robotic technology for recording, processing, and generating transaction reports (Sever Mališ et al., 2021; Sumarna, 2020). Basic accounting tasks are becoming more efficient with computer assistance, reducing the need for direct human involvement. This transition also promotes the creation of mobile applications to access data on mobile devices, tablets,

and virtual reality (VR). Real-time financial statement audits are enabled, ensuring data transparency and accuracy (Solikhatun et al., 2023). Accountants and auditors lacking IT expertise may risk losing their roles to other professions.

Stoica and Ionescu-Feleagă (2021) conducted a review of the most recent literature in the field of accounting digitalization using a structured literature review. Their study's findings emphasize that researchers predominantly concentrate on three key aspects: accounting education, professional regulation, and accounting information systems. These three key aspects are the focus of this article.

3.   METHODOLOGY

This paper utilizes a literature review methodology to investigate the history and potential future of the accounting profession, with a specific focus on the Croatian context. The reviewed literature spans from 2013 to 2023 and encompasses sources from various global regions. According to rigorous scientific methodology, the following databases were searched: the Web of Science platform, EBSCO Host, and Google Scholar. The considered selection of databases was motivated by its vast repository of scholarly content and the invaluable citation analysis tools it provides, significantly enhancing the depth and precision of the research.

The primary subject of investigation pertained to *digitalization * accounting*, encompassing a comprehensive exploration of articles covering diverse aspects of digitalization within the accounting discipline. The research inquiry was precisely tailored to specific Web of Science categories, exclusively "Business" and "Education - Educational Research" aimed at targeting scientific articles related to the educational aspects of digitalization in the accounting field. Moreover, to facilitate accessibility and comprehension, the search was confined exclusively to articles published in the English language. The chosen academic and professional papers underwent a rigorous evaluation, utilizing a diverse array of scientific research methodologies, which encompassed both inductive and deductive reasoning. Furthermore, these methodologies encompassed techniques involving analysis and synthesis, generalization, and abstraction, collectively constituting a robust framework for a systematic and comprehensive exploration of the available literature.

Finally, as a result of these research activities, a total of 40 articles were successfully identified and retrieved, each of which impeccably met the exacting criteria established for the study. This diligent and methodical approach ensured the selection of literature that was highly pertinent and instrumental in advancing the research objectives.

4. RESULTS AND DISCUSSION

RQ1: How is technology reshaping accounting, and what drives this change?

Digital technology profoundly impacts a company's strategy, competitiveness, business models, and market approach. It also significantly influences accounting information and management control systems (Mancini et al., 2017). While accounting principles remain stable over time, the accounting industry is evolving due to technological advancements. This transformation is reshaping accountants' roles and client expectations, with technology and digitalization enabling rapid updates and reducing the workload through modern computer systems. Rapid technological advancements, globalization, and increased competition are driving constant change across

professions. The accounting profession is particularly susceptible to the effects of technological developments and globalization, with many new digital systems now integral to the field. Research by Frey and Osborne (2013) identifies 702 job titles at risk of automation, with the accounting profession topping the list as highly likely to be automated and digitalized in the near future. Automation in accounting and auditing follows pre-programmed rules, streamlining processes using workflow automation software. This includes tasks like transaction processing, payroll, and accounts payable, enhancing internal controls, compliance, and fraud detection. Examples of automation in accounting encompass paperless invoicing, cloud accounting, and automated document testing. Major companies like Amazon, Wal-Mart, Nestle, DHL, and Adidas are already incorporating automated accounting into their operations (Akhter & Sultana, 2018). The evolution of the accounting profession is defined in Table 1.

Table 1. Accounting Evolution

Activities	Past, present and future situation
Data Entry	Historically performed by accountants, it now involves operators or accountant assistance and is gradually shifting towards automation using artificial intelligence.
Bookkeeping	Previously the domain of accountants, it currently relies on software, and the future trend is a combination of software and artificial intelligence
Compliance Work	In the past, accountants and auditors managed compliance work. Today, software is the primary tool, with the expectation of a more prominent role for artificial intelligence in the future.
Handling Client Documents	Account staff used to physically collect documents, but today, electronic documents and email are common. In the future, cloud technologies will streamline this process.
Preparing Bills and Requisitions	Historically an accountant's responsibility, it's now assisted by software, and machine learning will further enhance it in the future.
Preparing Ledgers	Accountants traditionally used spreadsheets for this task, and this practice will persist with the assistance of software in the future
Preparing Tax Documents and Calculations	Accountants previously handled this, and software is currently the norm. However, in the future, machine learning will play a more significant role.
Preparing Financial Statements	In the past, accountants prepared financial statements with the help of ERP and SAP software. In the future, there will be a greater reliance on XBLR for automated annual reports.

Source: Akhter and Sultana, 2018; Solikhatun et al., 2023

Table 2. Key digital advancements in accounting

Digital solutions	Key advancements in technology usage	Researcher
Artificial Intelligence (AI) and machine learning	• enhance businesses through real-time data and task automation, boosting efficiency and advisory services for accountants	Zhang et al. (2020) Hasan (2022) Malviya and Lal (2022) Cazazian (2022) Ranta et al. (2023)
Blockchain	• enhance data access, security, and process efficiency, potentially revolutionizing auditing, compliance, and reconciliation beyond cryptocurrency uses	Brandon (2016) Wu et al. (2019) Mosteanu and Faccia (2020) Cazazian (2022) Zhang et al. (2020)
Big data and analytics	• improving processes, data quality, efficiency, and reporting while influencing financial, managerial, and auditing practices	Arnaboldi et al. (2017) Witkowski (2017)
Internet of things (IoT)	• improved real-time data access, enhanced automation of financial processes, and increased accuracy in asset tracking and inventory management.	Hatane et al. (2019) Yilmaz and Hazar (2019) Wu et al. (2019) Karmańska (2021)
Cloud technology	• enhanced data security and accessibility, improved collaboration among remote teams, and cost-effective scalability for businesses of all sizes.	Dimitriu and Matei (2014) Mauricette et al. (2022)

Source: Own research

In the past, various accounting activities were primarily carried out by accountants. Today, many of these tasks are automated or assisted by technology. Table 2 shows key digital advancements that will significantly impact accounting professions in the future, according to researchers.

Zhang et al. (2020), Malviya and Lal (2022), Hasan (2022), Cazazian (2022), and Ranta et al. (2023) collectively emphasize how artificial intelligence (AI) is reshaping accounting. They analyze the challenges and opportunities, including the rising demand for IT professionals with accounting knowledge. These studies highlight the need for interdisciplinary collaboration in response to disruptive technologies and discuss the implications for education, regulation, and professional readiness, all pointing to significant changes in the accounting field.

RQ2: What educational adaptations are essential for preparing future professionals to navigate the evolving technological landscape in the field of accounting?

'As automation and technology continue to drive changing business models, the role of accountants and auditors will need to rapidly evolve and adapt' (Vitale, 2020). Gulin et al. (2019) emphasize that educational reform is imperative, with a specific focus on cultivating critical and systemic thinking in students to enhance their creative abilities. This transformation is deemed necessary due to the evolving responsibilities of accountants, who are expected to play a proactive role in the management and operation of companies. Such a role requires close collaboration with professionals from diverse functional areas, notably IT experts, to ensure the effective execution of a company's business processes.

According to Birt et al. (2023), the evolution of technology is expected to impact the digital skills needed by accounting graduates, which may require transforming accounting and finance education: Graduates will be solution architects, problem solvers, data analyst, design thinkers and storytellers. As highlighted by Berikol and Killi (2021), students pursuing accounting education should receive training in several key areas. This includes acquiring skills in data analytics to effectively analyze extensive datasets, gaining knowledge about data and cybersecurity, and being well-prepared for the continuing digitalization trends. The accounting profession is undergoing significant transformation as the world rapidly transitions into a digital era. Therefore, it is crucial to equip accounting students with the latest technology and tools to ensure their readiness for these changes.

Future accountants will focus more on more specific things because previously manually operated activities are operated by technology (Kruskopf et al., 2020). The accounting profession's expertise needed in the future includes IT knowledge, forensic IT, audit IT and data analytics (Pan & Seow, 2016). Meanwhile, Kruskopf et al. (2020) predict the jobs available for accountants in the future as blockchain accountants, healthcare accountants, cybercrime accountants, fintech accountants, cloud accounting specialists, fintech city planning accountants, data security accountants, historical accounting analyst, system integrator, and strategic accounting analyst. These jobs do not only require knowledge but also skills, both hard and soft. Hard skills include the ability to understand software, analytical skills, data visualization, international standard knowledge of accounting, knowledge of specific industrial regulation, basic coding, fintech knowledge of software, data warehouse management and enterprise resource planning. Meanwhile, soft skills include communication, conflict management, leadership, risk management, decision-making strategies, emotional quotient (EQ), adaptability, creativity, and customer orientation (Kruskopf et al., 2020). Therefore, a curriculum that teaches these skills is needed for prospective accountants to compete in the future.

5. CONCLUSION

The accountancy profession is shifting away from routine data entry duties and moving towards more complex tasks that involve advanced analysis and judgment-based accomplishments. As technology continues to advance, accountants must work together to adapt and thrive in the era of digitalization. This paper demonstrates that technology is not eliminating the accounting profession but rather transforming it with new and challenging responsibilities. The rise of robotics automation and drones is likely to replace certain manual accounting tasks, while artificial intelligence will redefine the role of accountants. Despite these changes, there is an expectation of a growing demand for highly skilled accountants.

Future accounting professionals must receive an education that integrates technological advancements. This includes comprehensive training in data analytics, artificial intelligence, and emerging software. Additionally, fostering critical thinking and adaptability in the face of technological shifts is crucial. Practical experiences in handling these technologies within educational settings will be fundamental in preparing these professionals to navigate the evolving landscape of accounting.

Finally, a limitation of this study stems from its limited coverage of the analyzed literature, as it is not comprehensive. While the adoption of digitalization and automation is a global phenomenon, there remains a lack of professional and academic research on the implementation of digitalization in accounting. Future research should focus on conducting primary research using surveys and in-depth interviews. This approach will provide valuable insights into the evolving role of accountants in the context of digitalization and automation.

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