THE ACCOUNTING PROFESSION AND THE PHENOMENON OF ITS DIGITAL TRANSFORMATION

- DOCTORAL THESIS SUMMARY -

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Abstract

The doctoral thesis titled: “The Accounting Profession and The Phenomenon of its Digital Transformation”, explores the digital transformation of the accounting profession, with an emphasis on understanding how emerging technologies such as: Artificial Intelligence (AI), Blockchain, Big Data, Cloud Computing, and Cybersecurity, reshape traditional practices and competencies. Anchored in the context of Industry 4.0, this research highlights both opportunities and challenges, related to efficiency gains, enhanced decision-making, and the evolving role of accountants. Methodologically, the thesis integrates a Structured Literature Review (SLR), to investigate the research evolution for our theme of interest, empirical surveys, to assess current digital competency maturity levels of small and medium-sized accounting practices (SMPs) and of accounting students, as well as qualitative interviews, focus groups and survey, to discover the perception of accounting professionals and students on the digital transformation of the field.

Findings reveal that while digital tools offer significant benefits, including automation and enhanced data analysis, they also present ethical and operational challenges, such as over-reliance on technology, privacy concerns, and financial accessibility issues. By evaluating digital maturity levels and examining perceptions, this thesis provides a comprehensive view of the profession's adaptability in the face of the rapid digitalization process. The results underscore the need for academic institutions to align educational curricula with the industry’s digital demands, ensuring that future accountants are equipped with essential technical and analytical skills.

The thesis concludes by offering recommendations to help the accounting field navigate its ongoing digital transformation, suggesting that successful adaptation requires balancing technological advancements with ethical considerations and robust professional standards. This work not only contributes to academic literature but also serves as a practical guide for practitioners, educators, and policymakers seeking to foster the accounting’s profession digitalization.

Keywords: *accounting profession; digital transformation; digital competency; technology acceptance; emerging technologies.*

1. Context and Importance of Research

The rapid adoption of digital technologies is reshaping numerous professional landscapes, and the accounting field is no exception. In an era defined by Industry 4.0, where technological advancements blur the lines between digital and physical domains, the accounting profession confronts new challenges and opportunities. Emerging technologies such as Artificial Intelligence (AI), Blockchain, Big Data Analytics, Cloud Computing, and Cybersecurity have become integral to business processes, promising enhanced efficiency, accuracy, and strategic capabilities. This transformation extends beyond operational improvements, as it necessitates a paradigm shift in the roles, responsibilities, and competencies required of accounting professionals.

Accounting tasks historically characterized by manual processes and repetitive calculations are increasingly being automated, allowing professionals to focus on higher-order activities like strategic decision-making and financial analysis. However, this shift brings potential risks and complexities. The reliance on digital tools raises ethical considerations, risks of data breaches, and the challenge of ensuring data integrity. Consequently, the accounting profession must adapt not only to leverage these advancements effectively but also to address the inherent risks and maintain ethical standards.

While significant progress has been made in researching individual digital technologies, existing literature on the comprehensive impact of digital transformation on the accounting profession remains fragmented. Most studies tend to focus on specific technologies (such as AI or Blockchain) in isolated contexts rather than examining the interdependencies and collective influence of these technologies on accounting practices and professionals. Additionally, limited research explores the perceptions of both current and future accountants (i.e., students) regarding the competencies and readiness required to thrive in a digitally driven environment.

The academic community has identified a need to assess not only technological adoption but also digital competency levels among accounting professionals and students. This is especially pertinent for Small and Medium-sized Accounting Practices (SMPs), which may lack the resources of larger firms to integrate advanced digital tools and provide relevant training. Furthermore, while frameworks like the Digital Competency Maturity Model (DCMM) and DigComp 2.2 offer insights into digital skills, these have yet to be systematically applied within the accounting domain to evaluate preparedness for digital transformation on both a practical and educational level.

This research, therefore, addresses the existing gap by offering a holistic analysis of digital competencies and perceptions within the accounting field, informed by both empirical data and qualitative insights. By examining the views of practitioners and students, the thesis provides a multidimensional perspective on how the accounting profession can bridge current competency gaps and adapt to a rapidly evolving technological landscape. This research aims to fill this gap by integrating structured assessments and empirical findings to guide future initiatives in educational reform, professional standards, and policymaking within the accounting field.

2. Research Objectives and Questions

The overarching aim of this research is to examine the digital transformation of the accounting profession by assessing the historical, practical, and perceptual dimensions of digital technology integration. To address these aspects, this research is structured around three core objectives: first, it evaluates the evolution and focus of digital technologies within accounting research by analysing the trajectory of these technologies over time and examining how advancements such as Cloud Computing, Blockchain, Artificial Intelligence, Big Data, and Cybersecurity have reshaped accounting practices, roles, and responsibilities.

Additionally, it assesses digital competency levels among both accounting Small and Medium-sized Practices (SMPs) and accounting students, evaluating their readiness for technology integration. Finally, it explores perceptions of digital transformation, investigating the views of accounting professionals and students regarding the impact of these technological shifts on their field, identifying both challenges and opportunities for adaptation. To achieve these objectives, the thesis is guided by specific research questions within each chapter, as shown below:

Chapter I: The Accounting Ecosystem of Digital Technologies

- ***How is research exploring digital technologies in accounting evolving?*** This question aims to offer insights into the historical development of research in this area and highlight how previous studies have shaped its present state.
- ***What are the main areas of focus and critiques regarding the impact of digital technologies in accounting literature?*** This question conducts a critical evaluation of the existing body of research, using a structured analytical framework to identify strengths, weaknesses, and gaps.

- ***In what ways are emerging digital technologies, either individually or as part of an ecosystem, influencing the work of accountants?*** This question explores the implications of digital transformation for accounting regulators, practices, and professionals, while also providing direction for future research agendas.

Chapter II: The Assessment of Digital Competency Levels in Accounting

- ***What is the current level of digital competency among accounting SMPs?*** This question evaluates the digital maturity level of Small and Medium-sized Accounting Practices and their readiness to adopt and integrate digital tools, focusing on their strengths and areas where additional resources may be needed.
- ***What is the digital competency level currently possessed by accounting students?*** This question examines the preparedness of students to meet the digital demands of the accounting profession, with a view to assessing the alignment between academic training and industry requirements.

Chapter III: The Perception of Accounting Professionals and Accounting Students on The Digital Transformation of The Field

- ***How do accounting professionals and students perceive the digital transformation of the field?*** This question investigates the attitudes and perceptions surrounding digital transformation, identifying both positive views and potential barriers to technology adoption within the accounting profession.

3. Theoretical Framework

The accounting profession's adaptation to digital technologies is shaped by emerging themes like automation, data security, real-time reporting, and digital competency development. These themes emphasize the shift from manual, transactional accounting tasks to complex, data-driven processes, facilitated by technologies such as Artificial Intelligence (AI), Blockchain, Big Data Analytics, Cloud Computing, and Cybersecurity. This digital shift demands a robust theoretical framework to address the factors influencing technology adoption, the digital readiness of professionals and students, and the ongoing development of competencies aligned with technological advancements.

To examine the dynamics of digital transformation within accounting, this research draws primarily from two key theories: the Technology Acceptance Model 2 (TAM2) and Diffusion of Innovation (DOI) Theory. Each theory underpins specific aspects of the research, with DOI Theory serving as basis and guide for Chapter II while TAM2 for Chapter III.

The Diffusion of Innovation (DOI) theory, developed by Rogers (1962), serves as a key framework for elucidating the process of digital technologies adoption by accounting SMPs and accounting students. DOI theory categorizes adopters into five groups (Innovators, Early Adopters, Early Majority, Late Majority, and Laggards), each illustrating a unique adoption behaviour pattern. The application of DOI theory in Chapter 2 involved assessing digital maturity by aligning digital competency scores with Rogers' ideal distribution, followed by adjustments to reflect the practical realities observed in the sample. This approach not only helped to determine the distribution of technological adoption within SMPs but also highlighted the variation in readiness among different adopter categories. Factors such as organizational size, leadership, and resource availability were pivotal in influencing adoption rates, reinforcing the theory's emphasis on both internal and external drivers of technology diffusion. The DOI framework was further utilized to compare digital competency levels between accounting SMPs and students, offering insights into how these groups align or diverge in their adoption readiness. This comparative analysis underscores the importance of targeted educational and strategic initiatives to bridge digital competency gaps and promote cohesive advancement in the accounting profession.

The Technology Acceptance Model 2 (TAM2), developed by Venkatesh and Davis (2000), is foundational to understanding technology acceptance among accounting professionals and students. TAM2 expands the original Technology Acceptance Model by including constructs like perceived usefulness, perceived ease of use, subjective norms, and image, factors that shape individuals' motivation to adopt new technologies. TAM2 is especially relevant for examining the digital competency of accounting students and professionals, as it sheds light on how perceptions of relevance, ease of use, and social influences drive technology acceptance. In this research, TAM2 provides a framework for analysing how accounting students and professionals perceive digital tools as essential to their roles. For instance, subjective norms and image within TAM2 help explain how accounting students' perceptions are influenced by peer and academic expectations regarding digital competency. Additionally, constructs such as job relevance and output quality align closely with the skills accountants need in a digitalized profession, where tools like AI and Blockchain enhance data processing and improve audit accuracy. TAM2's insights allow the research to assess the motivational and social dimensions of digital adoption, which are central to preparing future accounting professionals for a technology-integrated workplace.

In addition to TAM2 and DOI, this study incorporates two competency-focused frameworks: the Digital Competency Maturity Model (DCMM) and the DigComp 2.2 Framework. While TAM2 and DOI provide theoretical insights into technology acceptance and diffusion, these frameworks offer practical measures to evaluate digital readiness and competency among accounting professionals and students.

The Digital Competency Maturity Model (DCMM), developed by the European Federation of Accountants and Auditors for SMEs (EFAA), assesses digital maturity across organizational processes. The model categorizes maturity levels, from basic digital awareness to advanced integration of digital tools within accounting practices. In this study, DCMM is applied to evaluate digital competency within accounting SMPs, providing insights into how well-prepared these practices are for technology adoption. Given that SMPs often face resource constraints, DCMM's framework helps to identify areas where additional support or training may be needed to enhance digital adoption.

For evaluating the digital competencies of accounting students, **the DigComp 2.2 Framework** is employed. This comprehensive European digital competency model evaluates skills across areas such as information processing, communication, content creation, safety, and problem-solving. By applying DigComp 2.2 to accounting students, this research assesses digital readiness in a structured manner, pinpointing curriculum gaps that may impact students' preparedness for the accounting profession. This framework supports the analysis of digital literacy among future professionals, emphasizing the specific competencies needed to succeed a technology-driven industry.

Together, TAM2 and DOI offer a comprehensive theoretical foundation, addressing both individual motivation and broader social diffusion in digital technologies adoption. The DCMM and DigComp 2.2 frameworks provide practical measures to assess digital competency among professionals and students, respectively. This integrated theoretical framework enables a multidimensional understanding of digital transformation within the accounting profession, examining technology adoption from motivational, sociological, and competency-based perspectives.

This approach not only guides the study's data analysis but also situates the research within a broader discourse on preparing the accounting profession for future technological advancements. By combining these theories and frameworks, this thesis provides a robust, holistic perspective on the digital transformation journey within accounting, identifying challenges, opportunities, and actionable insights for both current and future professionals.

4. Methodology

This thesis employs a mixed-methods research design, combining quantitative and qualitative approaches to provide a comprehensive analysis of digital transformation within the accounting profession. This complex and diverse approach includes structured literature review (SLR), sentiment analysis, semi-structured interviews, focus groups, and questionnaires. Each method contributes unique insights that, together, offer a robust understanding of the digital competency levels, attitudes, and preparedness of current and future accounting professionals.

The research is organized into three primary phases, aligning with each chapter's focus. Chapter 1 centres on an SLR to establish the state of digital technology research in accounting. Chapter 2 assesses digital competency levels through surveys and quantitative data analysis, while Chapter 3 explores perceptions of digital transformation through qualitative interviews, focus groups and questionnaires. This structure ensures that both macro and micro-level factors are considered, addressing both theoretical insights and real-world applications.

Research Design

A Structured Literature Review (SLR) forms the basis of Chapter 1, providing an overview of existing research on digital technologies in accounting. The SLR methodology, inspired by Massaro et al. (2016), involves systematically collecting, categorizing, and analysing studies to map the trajectory and focus areas of digital technology research. Following SLR protocol, this review identifies key themes and gaps, allowing the study to position itself within a larger body of academic work. The review protocol includes criteria for study selection, quality assessment, and thematic categorization, which ensures that only relevant, high-quality studies are incorporated. This method offers a critical foundation for understanding the historical evolution and current status of digital transformation research in accounting.

To further enrich the qualitative dimension of the study, **Sentiment Analysis** is applied in Chapter 3. Sentiment analysis, using the NRC Emotion Lexicon and BING lexicons, examines emotional undertones in responses from accounting professionals regarding digital transformation. This approach quantifies subjective expressions, identifying positive or negative sentiments linked to emerging technologies like AI and Blockchain. By analysing sentiment within interview transcripts, the research gains a deeper understanding of how these professionals perceive the opportunities and challenges associated with digital transformation. Sentiment analysis complements thematic findings by revealing the emotional valence and attitudes that may influence technology adoption.

The Gioia Methodology, introduced by Gioia, Corley, and Hamilton (2013), is employed to structure the thematic analysis of qualitative data collected from interviews with accounting professionals and focus groups plus surveys with accounting students. This method enables the research to capture nuanced perspectives, moving from raw data to higher-order concepts. First-order codes represent participants' statements, which are then synthesized into second-order themes based on emerging patterns. Finally, these themes are integrated into aggregate dimensions that reflect broader insights on digital transformation. In this thesis, the Gioia Methodology aids in categorizing perceptions into themes like "Behavioural Factors," "Internal Factors," and "External Factors," providing a structured, empirically grounded understanding of how professionals and students perceive and engage with digital technologies.

Data Collection Methods

Semi-structured interviews with accounting professionals form a core component of the qualitative research in Chapter 3. These interviews explore professionals' firsthand experiences, views on digital competency, and perceptions of the benefits and challenges of technologies such as AI, Blockchain, and Big Data. The semi-structured format allows flexibility for participants to discuss both positive and negative experiences, providing insights into their motivations, hesitations, and expectations regarding digital transformation. Interviews are conducted with accounting professionals that have various professional backgrounds, ensuring a balanced representation of views within the accounting field.

Focus groups with accounting students offer a complementary perspective to the interviews, capturing students' readiness and attitudes toward digital transformation. The group setting encourages open discussion, allowing students to express their views on digital competencies required within the profession and the relevance of their academic training. These focus groups also reveal how students perceive the impact of digital tools on traditional accounting roles, contributing to an understanding of how future professionals view technology's role in their career trajectories. Conducted in an interactive format, the focus groups enable a collaborative exploration of students' digital literacy and expectations.

Quantitative data collection is achieved through **questionnaires** distributed to both practicing accountants in SMPs and accounting students. For SMPs, the questionnaire, based on the Digital Competency Maturity Model (DCMM), assesses levels of digital competency and identifies areas where additional training or resources may be needed.

For accounting students, the DigComp 2.2 Framework serves as the foundation for the questionnaire, evaluating competencies in digital literacy, information processing, content creation, and problem-solving. These questionnaires provide quantitative metrics to estimate digital readiness across different demographic groups, offering a baseline for competency levels and a structured approach to assessing digital literacy.

Samples and Participants

This thesis incorporates a comprehensive sample of accounting SMPs, professionals and students, providing a balanced representation of current and future practitioners in terms of digital readiness and competency.

In Chapter 1, a systematic literature review (SLR) was conducted to establish a foundational understanding of the digital transformation within the accounting profession. The final sample includes **180 scientific papers published from 2012 to 2023**, focusing on emerging technologies that drive the digitalization of the accounting field. These articles, sourced from peer-reviewed journals, explore technologies such as Cloud Computing, Blockchain, AI, Big Data, and Cybersecurity. By synthesizing findings from this extensive sample, the chapter traces the trajectory and impact of these technologies, highlighting how digital advancements have reshaped accounting practices, roles, and responsibilities. This review provides a comprehensive academic perspective on the forces shaping the profession's evolution.

For Chapter 2, which focuses on assessing digital competency levels, the sample includes **160 respondents** representing accounting Small and Medium-sized Practices (SMPs). This portion of the research aims to evaluate digital maturity within SMPs, given the unique resource constraints they often face compared to larger firms. The questionnaire SMPs was designed based on the Digital Competency Maturity Model (DCMM), allowing for a structured assessment of their digital competency across varying levels of technological adoption. Additionally, **161 accounting students** participated in a separate questionnaire inspired by the DigComp 2.2 Framework, which evaluates digital literacy across competencies such as information processing, communication, and content creation. This student-focused survey provides insights into the readiness of future professionals to meet the digital demands of the accounting field.

For Chapter 3, which examines perceptions of digital transformation in the accounting profession, a mixed sample approach was employed. **Interviews were conducted with 10 accounting professionals** to gather in-depth qualitative insights into their views on digital technology adoption and its impact on the profession.

In addition, **four focus groups** with an average of 20 participants (each comprising master's degree accounting students and practitioners), were conducted, totalling at least **80 participants**. A separate **questionnaire, completed by 168 respondents**, provided quantitative data on accounting students perceptions of digital transformation, further contributing to the analysis of views on technology's evolving role in accounting.

This diverse sample provides a broad spectrum of perspectives, from SMPs assessing their current competency levels to students and professionals expressing their perceptions of digital transformation. This methodological approach ensures that the findings are both comprehensive and relevant across different experience levels within the accounting profession.

5. Main Findings

This section synthesizes the primary findings from each chapter, showcasing the thesis exploration into how digital transformation impacts the accounting field. Each chapter's results provide essential insights, addressing the competencies, perceptions, and technological adoption required within accounting. Together, these findings illuminate how emerging technologies are shaping the profession, with implications for educators, practitioners, and policymakers.

5.1 Main Findings of Chapter I

Chapter 1's findings are drawn from an in-depth Structured Literature Review (SLR) designed to investigate the evolution of digital technology research in accounting, identify critical focus areas and critiques, and understand the influence of these technologies on the work of accountants. The review addresses three central research questions, each uncovering distinct but interconnected insights.

The first research question investigates the historical trajectory of research exploring digital technologies in accounting. Findings reveal that scholarly interest in this area has intensified over the last decade, largely due to advancements in key technologies like Artificial Intelligence (AI), Blockchain, Big Data Analytics, and Cloud Computing. Early studies predominantly focused on how these tools could optimize operational efficiency by automating routine accounting tasks, thereby minimizing human error and expediting workflows. As technology advanced, research themes expanded beyond automation, encompassing strategic applications such as predictive analytics, real-time reporting, and enhanced data security.

The progression of studies in this field highlights a shift in academic perspective: digital tools are no longer viewed merely as operational aids but as strategic assets capable of transforming accountants' roles and augmenting decision-making processes. This shift underscores the need for accounting professionals to not only adopt digital skills but also to embrace a mindset that aligns technology use with broader business objectives. By charting the evolution of research, this review provides a foundation for understanding the factors driving digital transformation within accounting and the emerging demands it places on practitioners.

The second research question examines key focus areas and critiques in accounting literature concerning the impact of digital technologies, structured by five primary categories: Research Methodology, Accounting Areas, Jurisdiction, Geographical Area, and Digital Technology. The literature includes various methodological approaches, with literature reviews being the most common among the 180 papers, highlighting a strong academic interest in synthesizing findings on digital technology's impact on accounting. Empirical studies, like case studies and surveys, are less frequent, indicating a gap in practice-oriented research that directly engages with industry shifts.

Within accounting sectors, the focus primarily spans management and financial accounting, financial auditing, and internal auditing. Management Accounting studies explore how digital technologies enhance internal processes and decision-making, while Financial Accounting research emphasizes improved transparency and compliance. Audit-related studies show significant interest in technology's role in securing audit trails (Blockchain) and predictive insights (AI). Most studies take an international or broad global perspective, signalling widespread interest in digital technologies in accounting. Although some clusters focus on specific regions, particularly Europe and to a lesser extent the USA, regional studies remain limited. This suggests that while digital technologies have global potential, their adoption is still at an early stage in most areas, requiring further localized research.

Concerning the digital technologies researched, the literature places particular emphasis on Blockchain with AI, Big Data and Cloud Computing, Cybersecurity also being discussed. However, cybersecurity concerns remain significant as digital adoption introduces new vulnerabilities. Critiques in the literature highlight the slow adoption rate among accounting SMPs due to limited resources, as well as ethical issues related to AI bias, decision-making reliability, and Blockchain privacy. The findings suggest a complex landscape of opportunities and challenges in integrating digital technologies into accounting, with a need for accessible resources, international standards, and comprehensive training to support responsible technologies adoption across the profession.

The third research question explores how emerging digital technologies influence the work of accountants, both as individual tools and as integrated parts of a technological ecosystem. AI and Big Data Analytics have significantly transformed accounting by enabling the processing of large data volumes for real-time, data-driven insights, thereby allowing accountants to adopt more strategic roles within organizations. Predictive analytics derived from Big Data, for instance, supports proactive decision-making by forecasting financial trends, while AI's data analysis capabilities streamline compliance checks and enhance error detection. Blockchain has equally impacted accounting practices, particularly within audit and transaction verification, where its ability to provide immutable, transparent records has elevated standards for accountability and trustworthiness.

However, the findings highlight that the combined use of these technologies, rather than their individual applications, poses considerable challenges. Integrating AI, Big Data, Blockchain, and Cloud Computing into a cohesive system requires managing issues of interoperability, data governance, and scalability. Without a structured framework for integration, organizations may struggle to harness the full potential of these tools. This challenge points to a need for adaptable digital skills within the accounting workforce and for accounting firms to implement standardized digital governance practices. The findings emphasize that accountants must be prepared not only to utilize these technologies effectively but also to manage their complex interdependencies, ensuring they contribute positively to organizational objectives.

Therefore, the findings from Chapter 1 reveal that digital technologies are redefining the accounting profession, shifting the emphasis from manual data handling to strategic, data-driven decision-making. The trajectory of research highlights a field undergoing dynamic change, with growing emphasis on the role of digital tools in augmenting, not just supporting, accounting functions. Yet, challenges such as ethical considerations, data security, and slow adoption in resource-constrained practices request a balanced approach that aligns technological adoption with ethical, operational, and regulatory frameworks.

The review underscores the critical need for accounting professionals to develop digital competencies that go beyond basic digital literacy. Skills in data analysis, cybersecurity, and digital ethics are essential for navigating an ecosystem where AI, Blockchain, Big Data, and Cloud are increasingly intertwined. Furthermore, the literature calls for reform in accounting education to align curricula with the digital demands of the profession. Only through a holistic, multidimensional approach to technology adoption which encompasses professional standards, organizational practices, and educational foundations, can the accounting profession fully leverage the opportunities presented by digital transformation while addressing the challenges it poses.

5.2 Main Findings of Chapter II

Chapter 2 provides an empirical analysis of digital competency levels within the accounting profession, focusing on Small and Medium-sized Accounting Practices (SMPs) and accounting students as future professionals. The chapter addresses the evolving digital skills required to adapt to a technology-driven accounting landscape, assessing current digital maturity through surveys completed by 160 accounting SMPs professionals and 161 accounting students, providing insights into digital readiness across these groups.

The first area of focus assesses the digital competency maturity levels of accounting SMPs, using a structured questionnaire based on the Digital Competency Maturity Model (DCMM) framework. Findings reveal that, overall, the digital maturity of these SMPs is limited, with most firms operating at a basic level. This level is characterized by the use of essential tools such as email, word processing, and spreadsheets, while more advanced levels of digital maturity (requiring tools like AI-driven software, data analytics platforms, and Blockchain), are less common. This limited digital maturity across SMPs highlights the varying stages of technological adoption within the sector, with only a few firms demonstrating readiness to integrate advanced digital solutions. The DOI theory is used to group SMPs into categories of adopters (Innovators, Early Adopters, Early Majority, Late Majority, And Laggards), showing that a large proportion of SMPs fall into the Late Majority or Laggard categories due to barriers such as financial constraints, lack of strategic vision, and insufficient IT support. These findings emphasize the need for targeted measures, including government or industry-sponsored grants and accessible training programs, to boost accounting SMPs' digital maturity and competitiveness.

The second area examines digital competency among accounting students using the DigComp 2.2 framework, which assesses skills in information processing, content creation, communication, and problem-solving. Results show that while students possess basic digital literacy, there are notable gaps in specialized skills crucial for modern accounting roles, such as data analytics, cybersecurity, and cloud-based software usage. The analysis also applies the DOI theory, identifying students primarily within the Early Majority category, with only a small number qualifying as Innovators or Early Adopters. This categorization suggests that students are aware of advanced technologies like AI and Blockchain but have limited practical experience with these tools, indicating a misalignment between academic curricula and industry needs. These gaps point to the importance of revising academic programs to include hands-on exposure to emerging technologies and specialized digital tools.

A comparative analysis reveals distinct challenges for both SMPs and students in achieving digital readiness. While SMPs face structural and financial limitations, students confront gaps in their educational preparation, creating a disconnect between the digital competencies taught and those demanded by the industry. The findings suggest a more integrated approach to developing digital skills, requiring collaboration between educational institutions, professional bodies, and industry stakeholders to cultivate a robust, industry-relevant skillset among accounting professionals. Both groups would benefit from targeted training in data analytics, cybersecurity, and advanced accounting software. For SMPs, advancing digital maturity depends on increased access to affordable digital tools and training, while for students, curricular reforms are necessary to bridge the digital readiness gap and ensure graduates are well-prepared for a technologically advanced accounting environment.

5.3 Main Findings of Chapter III

Chapter 3 investigates perceptions of digital transformation among both accounting professionals and students, uncovering distinct challenges, opportunities, and varying levels of readiness to adopt new technologies. Drawing on the Technology Acceptance Model 2 (TAM2) and utilizing the Gioia Methodology, this research develops a tailored framework for each group, identifying critical themes that shape digital adoption within the accounting profession. The findings from accounting professionals resulted from the 10 interviews conducted and the findings from the accounting students, obtained through four focus groups (with nearly 80 participants) and through a distributed questionnaire (with 168 responses) provide together an in-depth perspective on how digital technologies are perceived and approached within the field.

For **accounting professionals**, the Gioia methodology reveals four main themes that influence their approach to digital transformation: Behavioural Factors, Internal Factors, External Factors, and Educational Factors. Behavioural factors, including age, mindset, and prior experience with technology, strongly affect professionals' ease of use and comfort with digital tools. Younger professionals, those with a growth-oriented mindset, and those with positive past experiences with technology tend to be more open to adopting digital tools, enhancing both their perceived ease of use and confidence in navigating digital environments. Additionally, resources within firms, such as financial support, human capital, and client diversity, play a pivotal role in shaping the relevance and quality of technology adoption. Firms with sufficient resources are better positioned to invest in high-quality tools that support job relevance and improve output quality, especially when client demands drive voluntary adoption.

Moreover, the professionals' perceptions of digital tools are shaped by external factors, including technological advancements, regulatory changes, and available funding. While technological progress enhances perceived utility, regulatory requirements create normative pressure to adopt compliant and reliable tools, reinforcing a cautious approach to digital adoption. External funding opportunities further solidify the perceived usefulness of advanced tools, particularly in a highly regulated profession like accounting. Educational factors, such as continuous learning provided by universities, professional bodies, and financial education, emerge as essential to fostering digital readiness. Universities provide foundational digital skills, professional bodies support ongoing development, and financial education resources enable effective technology use, ultimately integrating digital competencies with the critical analytical capabilities valued within the field.

For **accounting students**, the Gioia framework identifies four central themes that reflect their unique perspective as future professionals: Technological Empowerment, Educational Upgrade, Employment Opportunities, and Professional Evolution. Students view digital tools as vital for enhancing efficiency and strategic thinking, perceiving tools like automation and data analytics as both intuitive and essential for achieving academic and professional success. This strong sense of ease of use and perceived usefulness highlights their belief that mastering digital tools can enhance accuracy and performance in their future roles. Beyond this, students emphasize the importance of curricula that integrate digital tools with practical experiences, highlighting the relevance of these skills for their career ambitions. Developing such competencies is expected to align closely with their future responsibilities, preparing them to produce high-quality work that meets real-world standards.

Motivated by employment goals, students often take the initiative to learn digital tools independently, recognizing that these skills are critical for securing positions in a competitive job market. Industry expectations play a significant role in this context, as students are motivated to acquire skills that align with employer demands. Through hands-on experiences, they witness firsthand the advantages of digital technologies, reinforcing their competitive edge. Additionally, students see these technologies as crucial for adapting to the evolution of the accountant role and enhancing their professional image. Their experiences during studies and internships foster a readiness to meet shifting industry requirements, linking digital skills to both ease of use and a strengthened professional reputation as they prepare to enter a digitalized profession.

In comparing the Gioia frameworks for professionals and students, both shared and contrasting themes emerge in their views on digital transformation. While both groups recognize the efficiency and potential of digital technologies, their motivations and challenges vary.

Professionals focus on balancing digital competencies with analytical skills in an environment where resources are limited, while students are more enthusiastic, driven by career alignment and practical preparedness. The frameworks developed through the Gioia Methodology provide a profession-specific perspective on how digital transformation unfolds uniquely for each group, offering a deeper understanding of their chosen pathways to digital readiness.

The findings from Chapter 3 underscore the importance of professional development and educational reform. For professionals, structured support that integrates digital competencies with traditional skills is essential for adapting to an evolving industry. For students, there is a clear call for curricula that balance theoretical knowledge with practical, real-world applications, preparing them for future roles in a digitalized workplace. By aligning TAM2 components, such as perceived usefulness and ease of use, with insights drawn from the Gioia frameworks, this study advocates for a holistic approach to digital transformation, which prepares the accounting profession to embrace technological advancements while preserving foundational values and skills.

6. Thesis Conclusions

The integration of advanced digital technologies such as Big Data, Cloud Computing, Artificial Intelligence, Blockchain, and Cybersecurity, has led to profound changes in accounting practices, marking the "digital transformation of the accounting profession." This doctoral thesis comprehensively examines this transformation, focusing on research development, digital competencies, and the perspectives of accounting professionals and students.

The conclusions drawn from this research encapsulate findings across all thesis chapters, reflecting the challenges and opportunities emerging technologies present to the accounting field. The results lead to the formulation of recommendations for accounting firms, educators, and policymakers to navigate the process of digitalization effectively. Additionally, the thesis contributes significantly to the existing body of academic literature by highlighting both theoretical and practical aspects of digital transformation. The thesis mentions the research originality as well, while acknowledging its limitations and proposing future research directions.

Regarding the status of academic literature, the structured literature review in this thesis provides an extensive overview of the digital transformation in accounting, focusing on the adoption of Cloud Computing, Big Data, Blockchain, AI, and Cybersecurity. These technologies are reshaping traditional accounting, driving efficiency and innovation while revealing critical gaps in the existing literature.

This review shows a shift from conventional accounting practices to technology-driven approaches, emphasizing automation, data accuracy, and decision-making improvements. However, further empirical studies on digital adoption in accounting field, especially across different regions and firm sizes, are essential to broaden the global understanding of this transformation.

A central theme of this research is **the assessment of digital competency maturity levels** among small and medium-sized accountancy practices (SMPs), and among accounting students. In accounting SMPs, digital competencies vary widely, with some firms actively embracing digital technologies and others lagging due to limited resources. This divergence underscores the need for targeted training initiatives to help all firms adapt effectively. For accounting students, while general digital preparedness is evident, gaps remain in areas like cybersecurity and advanced data analytics. Addressing these gaps in educational curricula will ensure that students are equipped to meet the demands of an increasingly digital profession.

This thesis provides as well valuable insights into **the perceptions of both accounting professionals and students** regarding digital transformation. Professionals view technological advancements as opportunities to shift from routine tasks to strategic roles, although some express concern over the need for continuous learning and adapting to rapid technological changes. Students, on the other hand, generally embrace digital technologies enthusiastically, seeing them as critical to career readiness. These perspectives highlight the importance of evolving educational approaches to include practical digital training, bridging the gap between academic knowledge and workplace requirements.

The digital transformation of accounting brings both **challenges and opportunities**. Challenges include a generational and skill-based digital divide, the rapid pace of technological development, and increased data security concerns. Addressing these issues requires an ongoing commitment to learning and adaptation within firms, alongside robust cybersecurity measures to protect financial data. As opportunities, digital technologies streamline processes, improve service quality, and allow accountants to take on more value-added activities, such as financial analysis and advisory roles, which enhance their contribution to business success and sustainability.

The findings of this thesis carry significant **practical implications** for the accounting profession, particularly for educational institutions, accounting SMPs and professional organizations invested in digital transformation. By identifying the specific challenges and gaps in digital competency, the findings guide actionable recommendations that can help bridge the current divide between technological potential and practical readiness.

For **accounting firms**, embracing digital transformation requires significant investment in technology infrastructure, including software, cloud solutions, and cybersecurity. In this context, firms are encouraged to implement continuous training programs to keep accountants updated on the latest industry trends, promoting a workplace culture that supports innovation and adaptability. Leaders in firms should also incentivize employees to explore new technologies and workflows, thereby fostering an environment conducive to continuous improvement.

As digitalization shifts accounting roles towards strategic and advisory functions, **accounting professionals** need to invest in building digital skills, particularly in data analytics, blockchain, and AI. Continuous learning through formal and self-directed education will enable professionals to stay current with technological advancements and maintain their competitive edge. Additionally, professionals are encouraged to actively experiment with new digital tools that automate routine tasks, freeing them to focus on more strategic responsibilities.

Universities and other educational bodies play a crucial role in preparing students for a digitalized accounting profession. This thesis suggests that accounting curricula should be updated to incorporate hands-on digital training, bridging the gap between theoretical learning and practical application. Collaborations with industry professionals can offer students real-world insights into digital tools in accounting. Such partnerships, including guest lectures, internships, and joint research projects, will help align academic programs with industry expectations.

This thesis contributes significantly to the existing body of literature on digital transformation in accounting. By offering empirical evidence on the levels of technology adoption and digital maturity among accounting SMPs and students, it fills a gap in current research that has predominantly focused on theoretical implications without in-depth empirical validation. Additionally, the thesis integration of multiple perspectives (accounting professionals and students), offers a comprehensive view of how digital transformation is perceived and experienced within the field, extending beyond the isolated aspects of digital adoption.

This research questions several conventional views within the accounting profession regarding digital transformation. For instance, the widespread assumption that digital adoption is inherently beneficial overlooks the potential risks posed by over-reliance on automation, particularly the erosion of critical accounting skills. While technology undoubtedly improves efficiency and reduces error, it also shifts the role of the accountant from manual processing to oversight and analysis, which requires sustained investment in digital ethics and analytical reasoning. This shift calls for a reimagining of the profession's core competencies, blending digital skills with the foundational judgment and scepticism that have long defined accounting standards.

Additionally, the findings challenge the view that late technology adoption in accounting signals resistance to change. Instead, the research suggests that this cautious approach may be a strategic decision grounded in the profession's commitment to reliability and accuracy. This conservative adoption pattern points to a need for a more nuanced understanding of digital transformation in accounting, recognizing that in certain professions, the measured adoption of new technologies can be an advantage rather than a limitation. The thesis advocates for a balanced approach that respects the profession's core values while adapting to the transformative potential of digital technologies, ultimately fostering a digital competency framework that aligns with both traditional and modern accounting demands.

The originality of this thesis is highlighted by its exploration of the digital transformation within the accounting profession, focusing on the combined impact of emerging technologies. Unlike prior studies that often examined these technologies in isolation, this research evaluates a range of innovations such as: Cloud Computing, Big Data, Blockchain, AI, Cybersecurity, and their collective influence on accounting practices. This comprehensive perspective contributes to current academic discourse and anticipates future industry challenges. A unique aspect of this research is its focus on digital competencies among accounting SMPs and students, an often-underexplored area of digital transformation. By analysing current digital maturity levels, the thesis identifies significant gaps that need addressing to prepare both current and future accountants. These findings have implications for educational strategies and professional development, offering practical solutions relevant to an increasingly digital work environment.

This thesis also stands out for integrating various theoretical frameworks and methodologies, including the Technology Acceptance Model 2 (TAM2), the Diffusion of Innovations (DOI) theory, a Systematic Literature Review (SLR), and the Gioia Methodology. This combination provides a multidimensional analysis of how digital transformation is perceived and adopted in the accounting profession, extending beyond typical one-dimensional studies. The inclusion of perspectives from accounting SMPs, professionals and students, adds further depth. This approach reveals varied experiences and responses to digital transformation, highlighting challenges and opportunities for different segments within the field.

Therefore, the thesis's originality is reflected in its holistic approach to digital transformation in accounting, merging theoretical and practical insights, evaluating technologies collectively, and emphasizing digital competencies, encouraging connections between educational institutions, professional bodies, and accounting firms. The diverse methodologies and multiple perspectives from various stakeholders, provide a comprehensive analysis that supports future studies and actionable strategies in the field.

The thesis acknowledges **several limitations that inform future research directions**. A key limitation is the geographic focus on Romania, which may constrain the generalizability of findings to other regions. Future studies should extend this research to encompass a broader geographic scope to capture variations influenced by different regulatory, economic, and cultural contexts. The research primarily examines five technologies (Blockchain, AI, Big Data, Cloud Computing, and Cybersecurity) that significantly impact accounting. However, the field is also shaped by other emerging technologies, such as the Internet of Things (IoT), Machine Learning (ML), and Robotic Process Automation (RPA). Future investigations should include these to provide a more comprehensive understanding of the digital transformation landscape. Moreover, examining the relationship between digital competencies and regulatory frameworks could yield observations into how regulations can facilitate or hinder digital adoption. Finally, the rapid pace of technological change may affect the applicability of the current findings, necessitating ongoing research to keep pace with advancements and ensure that insights remain relevant and practical.

In conclusion, this thesis introduces a comprehensive framework that integrates the technological, practical, educational, and perceptual aspects of the phenomenon of digital transformation in the accounting profession, offering a holistic perspective that is often lacking in current literature. This framework serves as a foundation for future studies aiming to delve deeper into the interactions among these dimensions. Additionally, by empirically validating theoretical concepts from prior research, the thesis strengthens the evidence supporting the impact of digital technology on the accounting field, enhancing the credibility of its findings. The research also provides practical recommendations for accounting professionals, firms, and educators on how to turn the challenges posed by digital transformation into opportunities for innovation and growth. These recommendations can inform new policies and educational strategies, helping ensure that the accounting profession remains adaptable and competitive in the face of technological advancements. Ultimately, the significance of this research lies in its ability to guide the accounting industry through the complexity of the digital transformation process. By filling gaps in current literature and suggesting actionable steps, this thesis contributes to ongoing discussions about the future of the accounting profession in an era of rapid digital change. This thesis underscores that the future of the accounting profession lies in its ability to adapt, innovate, and integrate emerging digital technologies. Accounting professionals and students must continue to develop their digital skills and embrace lifelong learning to meet the demands of a digital workplace. By focusing on ethical practices, collaboration, and adaptability, the accounting profession can transform digital challenges into opportunities for growth, ultimately securing its relevance and success in an increasingly technology-driven world.