Exploring Perceptions and Experiences of Blockchain Implementation in Auditing: A Multiple Case Study

Dissertation Manuscript

Submitted to National University

School of Business

in Partial Fulfillment of the

Requirements for the Degree of

DOCTOR OF BUSINESS ADMINISTRATION

by

NAVIN W. JAMES

San Diego, California

September 2025

Abstract

Blockchain technologies are poised to reshape financial statement audits, yet authoritative guidance remains limited. The purpose of this qualitative multiple case study was to examine perceptions and experiences with established accounting standards regarding blockchain implementation in practice in the United States. Accounting theory and the extended technology acceptance model guided the study. Data were collected from 14 semi-structured interviews, an open-ended survey, and organizational documents from auditing firms. Reflexive thematic analysis and triangulation produced seven themes across three domains. Auditors reported limited real-world exposure, heavy reliance on legacy professional guidance, and implementation hurdles, including client education, tool limitations, and regulatory ambiguity. Participants anticipated efficiency gains from immutable, real-time ledgers, such as faster confirmations and more reliable provenance, and emphasized that transparent, codified standards are a prerequisite for mainstream adoption. Alignment with existing theoretical frameworks was uneven, often recognized conceptually but seldom operationalized, and current regulatory materials were viewed as helpful for framing risk but incomplete for method design. The study contributes practitioner-grounded evidence on blockchain's auditability, highlighting immediate needs for targeted standards, competence development, and carefully scoped pilots on permissioned networks. These findings inform standard setters, firms, and educators seeking to integrate distributed-ledger evidence without compromising assurance quality.

Acknowledgements

I want to thank my dissertation committee, Dr. Mary Dereshiwsky, for her valuable input, guidance, and patience, helping me get through, and for sharing her expertise and knowledge on this personal journey. I thank Dr. Ghany for his expertise and immediate response to research milestones. I am grateful to Dr. John Frame for taking an interest in this work and spending the time to guide me through this process. I also sincerely thank Stacey Hemmerick, academic and financial advisor. Stacy went the extra step and called several times to ensure the desire to finish. Thanks to National University for making this possible, with excellent resources and constant improvement in academic support.

I sincerely thank the School of Business colleagues for their insightful discussions and academic support.

Lastly, I want to acknowledge my family for their unwavering love and encouragement. This journey has not been easy, but it has been worth it.

Table of Contents

List of Tables

Chapter 1: Introduction

Since its debut in 2008 with Bitcoin, blockchain technologies have captured the imaginations of futurists, technologists, and the public with promises of a decentralized and transparent technological landscape (Mumford et al., 2024; Tripathi et al., 2023). While recent years have seen a cooling cryptocurrency market, the potential of blockchain technologies remains strong. Although the initial use of the technology was for digital currencies, it has potential applications across a variety of other spheres (Tiron-Tudor et al., 2021b).

Blockchain is a technology that creates a cryptographic database of peer-to-peer transactions, which are subsequently verified and validated by other users in the network (Chedrawi & Howayeck, 2018; Gauthier & Brender, 2021). These verified transactions need not be limited to currencies; they can apply to non-fungible digital goods or information. Thus, blockchain technologies may be understood as tools rather than products: mechanisms that can provide "*traceability, transparency, and decentralization*" to any system (Desplebin et al., 2021; Gauthier & Brender, 2021).

As with any revolutionary technology, it will be some time before the applications of blockchain technologies are fully explored, implemented, and understood. The technology will likely have significant long-tail effects across various industries (Chedrawi & Howayeck, 2018). Auditing is one industry likely to undergo considerable changes. Auditing is the process through which individuals and organizations verify the existence of transactions and attest to their accuracy and completion (Gauthier & Brender, 2021; Rozario & Thomas, 2019a). While financial and tax auditors have traditionally conducted audits, blockchain-based transactions are expanding.

Blockchain technology may revolutionize auditing by providing an immutable, tamper-proof record of transactions. This could reduce fraudulent activity and increase transparency in the auditing process (Rozario & Thomas, 2019a). The auditing process has become increasingly complex as rules and regulations have proliferated, driving up costs and time requirements (Gauthier & Brender, 2021). Blockchain-based audits may improve efficiency by enabling faster and more efficient audits, as all relevant data would be stored on the blockchain and readily accessible. Additionally, smart contracts could automate certain aspects of the audit process, further increasing efficiency (Rozario & Thomas, 2019b). Ultimately, blockchain technology could significantly improve auditing accuracy and transparency while reducing costs.

Although blockchain has the potential to streamline auditing processes, there are also risks associated with its use. One of the most significant is that blockchain is still relatively new and untested, meaning unforeseen issues could arise when used for auditing purposes. Another risk is that blockchain could be used to commit fraud or conceal information from auditors (Gauthier & Brender, 2021). Additionally, if there are errors in the data stored on the blockchain, they may be difficult to correct. Finally, because blockchain is a decentralized system, its implementation and proper management within an organization may be challenging.

Statement of the Problem

The problem addressed in this study was the need for greater understanding and regulation surrounding auditing blockchain technologies. Blockchain is expected to be highly disruptive in various fields, with auditing practices particularly affected (Desplebin et al., 2021; Gauthier & Brender, 2021; Liu et al., 2019; Secinaro et al., 2021). These disruptions have yet to be fully understood and planned for. Blockchain is a recent technology, and although many have speculated on the potential implications of blockchain, its effects have yet to be fully felt. Indeed, there remains a need for greater understanding of the perceptions and experiences surrounding blockchain implementation in auditing practice. Similarly, auditing standards have lagged and are not yet adequate to address blockchain’s impact on the field (Gauthier & Brender, 2021; Secinaro et al., 2021).

This lack of standards and understanding in auditing challenges businesses and regulators. With the absence of auditing standards on the use of blockchain (Gauthier & Brender, 2021; Secinaro et al., 2021), research is needed to identify auditors' perceptions and experiences with blockchain in auditing practice. This is a common dilemma in the standards and regulations field. Disruptive technologies tend to move much faster than the regulatory bodies that seek to control them. While new approaches are implemented, regulators must adapt in an ad hoc manner. This gap between emerging technologies and the standards and regulations opens the door to inefficient, exploitative, and unsustainable practices. The findings of this study may contribute to existing research and impact practice by identifying challenges and experiences with blockchain in the auditing context.

Purpose of the Study

The purpose of this qualitative multiple case study was to examine perceptions and experiences with established accounting standards regarding blockchain implementation in practice in the United States. At the time of this study, there were no generally accepted accounting principles (GAAP) for cryptocurrencies. Blockchain technologies are expected to advance in the coming decades, so it is critical to understand how practitioners in the auditing field understand and respond to the changing landscape. They are most likely to be on the "front lines" of the issue Therefore, they are in an exceptional position to leverage their expertise and experience into meaningful insights into the challenges ahead. Furthermore, they will most likely identify the existing regulations' problems as potentially outpaced by technological realities. Thus, the researcher identified relevant auditing organizations, distributed surveys to employees of said companies, and subsequently gathered data through semi-structured interviews. Through these data sources, the researcher identified the significant challenges auditors faced, located the sites of friction with organizational or regulatory elements, and developed best practices. More specifically, using the theory of organizational change in conjunction with a framework developed by Tiron-Tudor et al. (2021a), the researcher anticipated the significant impact of blockchain technologies on auditing practices.

Introduction to Theoretical or Conceptual Framework

This research required synthesizing two strands of theoretical literature: organizational change and auditing standards as employed by the Financial Accounting Standards Board (FASB) and U.S. Generally Accepted Accounting Principles (GAAP). Organizational change and development standards have roots in the mid-20th century but have grown in sophistication and scope over time. They examine how organizations respond to exogenous and endogenous evolutions and how these changes cascade throughout the organization and beyond (Pettigrew et al., 2021). Theories of organizational change are principally concerned with three vectors of questioning. The first regards the nature of change generally and what prompts organizations to react to circumstances. These circumstances may be outside forces, such as market conditions, regulatory requirements, technological innovations, or internal drivers, such as leadership or personnel turnover. Second, organization theory concerns process, sequencing, and time horizons. There has been a robust debate within the literature about the pace of change, whether it is incremental over more extended periods or episodic. Third, and most critical for the current research, is marrying theoretical models to practical application. While the theory concerns universal patterns, it must ultimately be applied to specific instances. Understanding the adaptation process to blockchain technologies requires a close reading of theoretical principles and applying those principles to practice.

Accounting theory (AT) is a field of study that seeks to identify, explain, and predict accounting practices, including auditing. AT has roots in economics and philosophy and has been shaped by various schools of thought. The "Father of Accounting," Luca Pacioli, documented the first systemic description of double-entry bookkeeping in his 1494 book, *Summa de arithmetica, geometria, proportioni et proportionalita* (Pacioli, 1494, pp. 1-5)

. Today, accounting standards inform and guide accounting practice and resolve issues when there is no clear rule or guidance on accounting for something. There are many approaches to accounting standards, with ongoing research in this area. Indeed, there is even some debate about what AT is (Sterling, 1967; Whittington, 2007). There are three different basic approaches to developing AT. The first and oldest has its roots in the early 20th century when AT was predicated on pure empirics, describing the processes already in action. This philosophy is evidenced by researchers such as Hatfield (1927). On the other end of the spectrum is "pure" theory, where researchers use deductive assumptions about how accounting "ought" to be done (Sterling, 1967; Whittington, 2007). With AT, the Chicago school proposed a happy medium between these extremes, blending empirical and deductive approaches (Whittington, 2007).

Theorists have provided different frameworks through which to understand accounting as a practice. It may be understood as a historical record, as data used by others to understand and evaluate the past (Davis et al., 1982). To the skilled historian, accounting can provide raw data that, through analysis, may elucidate behavioral patterns. It may also be understood as reflecting current economic realities in modern, concrete terms. In this sense, accounting data reflects an external financial situation through which business leaders may make forward-facing decisions based on financial information. Third, accounting functions as an information system through which the accountant or auditor navigates a set of informational structures and extracts data for an interested party. Finally, accounting has become a commodity, where information can be bought and sold on the open market (Davis et al., 1982).

Accounting data relies on four core principles. First, it must be relevant. Institutions generate tremendous volumes of information, and accounting data must pertain directly to the question. Second, it must be helpful. Data for data's sake is an exercise in futility. Third, it must be reliable; accounting must reflect some external reality. Finally, it must be consistent. Accounting methods, measurements, and presentation formats must be standardized to be utilized by different stakeholders (Sterling, 1967). This standardization is summarized in GAAP, which sets guidelines for the presentation of accounting information for publicly traded corporations.

These principles have been employed by the Public Company Accounting Oversight Board (PCAOB n.d.) to further standardize processes for public practice auditing. More specifically, the PCAOB was established under the Sarbanes-Oxley Act of 2002 to create a standardization framework and general principles for public accounting firms. One subsection of the PCAOB addressed auditing standards for analytical procedures (AS 2305), confirmation processes (AS 2310), and sampling standards (AS 2315). However, the realities of blockchain technology are not currently reflected in these standards and need to be further studied and understood in the context of emerging technologies.

Researchers have more closely examined the effects of blockchain technologies on accounting practices in theoretical contexts and have developed frameworks for anticipating the implications of such technologies for the industry. Specifically, Tiron-Tudor et al. (2021a) proposed a framework for anticipating the opportunities and challenges posed by blockchain. They argued that the downstream effects of blockchain on the accounting and auditing industry would be significant, presenting both challenges and opportunities for auditing organizations and the companies that employ them. These changes were distilled into four distinct categories: (a) the changing role of accounting and auditing within society, (b) the role of accountants within their respective organizations, (c) the new scope and focus of accounting and auditing organizations, and (d) new responsibilities and workflows for accounting and auditing organizations. These four categories provided the scaffolding through which organizational change theories were employed to understand the impacts of blockchain technologies on auditing firms.

Introduction to Research Methodology and Design (Nature of the Study)

A multiple case study design was employed to understand auditors' perceptions of blockchain technology within auditing organizations in the United States. The research process began with identifying individuals through the Oklahoma Society of Certified Public Accountants (CPA) who were involved in financial auditing and were willing to participate in the study. The data collection process involved three sources, with consent obtained from both participating companies and individuals in accordance with institutional review board (IRB) requirements

The first step in the research process was the distribution of open-ended surveys to all auditors working within the participating organizations. Surveys offered an inexpensive and efficient way to gather large amounts of data from a variety of individuals. The surveys were distributed and collected electronically, ensuring quick and easy access while minimizing participant burden, thereby encouraging broad participation.

The second source of data consisted of semi-structured interviews. Participants were recruited through a call for volunteers embedded within the surveys. The final sample consisted of 14 participants. Semi-structured interviews allowed wide latitude to investigate the phenomenon of blockchain in auditing. Unlike more rigid methods, these interviews enabled the researcher to ask ad hoc questions, pursue relevant lines of inquiry, and allow participants to speak candidly on topics of interest (Bryman, 2016).

The final data source was documentary data provided by the participating organizations. Documentary data consists of written or visual materials not originally created for social science research but instead developed in pursuit of institutional goals (Bryman, 2016). These documents yielded two types of data. First, they reflected organizational guidelines, rules, and policies, particularly insofar as these were publicly accessible. Second, they provided materials explicitly referencing blockchain technology, such as pilot project documents, training manuals, or technical guidance. Although such documents were generally limited to generic policies, they served as a litmus test of decision-makers’ attitudes, approaches, and priorities. Special attention was paid to documents relating specifically to blockchain technology.

Together, these three data sources generated a substantial volume of qualitative data. Interview transcripts, survey responses, and documentary evidence were organized and coded. The analysis began with open coding, which involved breaking down transcripts, surveys, and documents into discrete elements referred to as "codes" (Berg, 2021). Coding entailed identifying recurring motifs and observations and organizing them into manageable data units (Bengtsson, 2016; Catanzaro, 1988; Cavanagh, 1997). These codes were then arranged into categories and broader themes based on patterns emerging from the data (Bengtsson, 2016; Catanzaro, 1988).

Armed with these themes, the researcher identified salient patterns across the dataset. Further analysis was conducted using narrative analysis, particularly in the context of the semi-structured interviews. Narrative analysis involves identifying storytelling patterns communicated by human subjects on a given topic (Bryman, 2016). The transcripts from these interviews were again coded and analyzed to extract recurring narrative motifs, key lessons, and expressed challenges.

Research Questions

The following research questions guided this study:

RQ1

How do financial auditors in auditing organizations describe their perceptions and experiences regarding the impact of blockchain on auditing practices, workflow, and focus?

RQ2

How do these perceptions and experiences conform to the framework developed by Tiron-Tudor et al. (2021a) and auditing standards from the PCAOB?

Significance of the Study

This research further established the need for auditing standards to address emerging technologies, particularly in relation to analytical procedures, confirmation processes, and sampling methods. Without updated standards, auditors are left to interpret existing guidance in ways that may be inconsistent or incomplete. A deeper understanding of the weaknesses within the regulatory framework and blockchain technologies may improve the efficacy of existing regulations and better reflect blockchain's practical utility. Such understanding can also highlight areas where professional training and competence development are most urgently required. By identifying these gaps, the study provides evidence to support both incremental improvements to current auditing practices and long-term reforms that anticipate future technological. The insights generated from this study may be valuable to several stakeholder groups. First, auditors are increasingly tasked with performing blockchain-related audits. Although greater blockchain use is expected to enhance transparency, efficiency, and accuracy in audit practice (Rozario & Thomas, 2019b), it may also introduce new challenges. Lagging standards and regulations from standard-setting organizations generate uncertainty and inefficiencies as auditors attempt to adapt. Auditors must also address novel risks, as a digital and blockchain-dependent infrastructure may increase vulnerability to cyber threats (Gauthier & Brender, 2021). In short, their ability to execute their responsibilities effectively hinges on understanding how blockchain influences the technological landscape of their profession.

Regulators may also benefit from the findings of this study. Understanding the practical implications of blockchain from the perspective of auditors can inform more timely and responsive regulatory action. Finally, developers and designers of blockchain technologies may gain insight from this research. As the architects of such systems, they must understand the needs, experiences, and perceptions of end users and auditors to design tools that are both functional and aligned with industry expectations.

Definitions of Key Terms

Blockchain

Blockchain is a database of cryptographic transactions within a network of peers, in which the transactions are verified by the network. (Gauthier & Brender, 2021)

Cryptography

Cryptography is the process of encryption that uses public-private key pairs. Cryptography is a central component of creating a secure ledger (Liu et al., 2019).

Permissioned Blockchain

A permissioned blockchain restricts membership and control of procedures. This system is not entirely decentralized and allows some level of control and privacy over the ledger (Liu et al., 2019).

Permissionless Blockchain

A permissionless blockchain system is complete where the information is fully decentralized, with nodes in control of the system, maintained by all, and monitored by all (Liu et al., 2019).

Summary

This study examined auditors’ perceptions and experiences with emerging blockchain technologies and their interplay with current regulatory frameworks. Blockchain technology has the potential to revolutionize transparency and recordkeeping and, by extension, auditing practices globally. Various researchers have speculated on these changes, but few empirical studies have investigated the perceptions of auditing practitioners. Furthermore, although significant transformations appear to be on the horizon, legislation and regulation remain inadequate to manage the shift to new technologies. To address this gap, the researcher investigated auditors' perceptions through semi-structured interviews, documentary data, and surveys distributed across several auditing organizations.

Chapter 2: Literature Review

The disruptive potential of blockchain technology (BT) is broadly documented in financial auditing practice, whereas awareness levels remain low (Desplebin et al., 2021; Gauthier & Brender, 2021; Secinaro et al., 2021). The problem addressed by this research is the low adoption of BT in financial auditing due to limited awareness and knowledge regarding its integration into practice. Having been recently introduced into auditing, the researcher found that there remains no clear understanding of the perceptions and experiences surrounding blockchain implementation.

The purpose of this qualitative case study was to explore the perceptions and experiences of financial auditors working in firms regarding how BT could impact financial auditing practice. The goal was to understand auditors' perspectives on the potential effects of BT on their daily work and the profession. This sector remains under-researched despite the likelihood of significant disruptions due to BT. The findings from this study may benefit auditing practices by facilitating the integration of blockchain technology and improving transparency and accountability in financial accounting.

The literature review section is organized into various themes and subthemes relevant to the study topic and phenomenon. A theoretical framework incorporating two theories, accounting theory (AT) and the extended technology acceptance model (ETAM), along with empirical literature, was reviewed and justified as the guiding framework for the study. The introduction, prior applications, and intended application of each theory in the study are addressed. The empirical literature synthesized research on the evolution of financial auditing, relevant trends, the impact of technology on auditing, and the changing roles of accountants and auditors. Other key themes included frameworks governing the use of technology in financial auditing, the merits and demerits of using technological tools in auditing, and the implementation of BT in financial auditing. Past studies addressing the challenges of blockchain implementation, its impact on auditing practices, and perceptions of that impact were also reviewed.

A search for relevant literature was conducted to obtain books, journal articles, academic research studies, dissertations, reports, conference papers, and websites. The search strategy included querying databases and titles related to the topic to identify scholarly materials published between 2017 and 2023. An exhaustive search for peer-reviewed articles on blockchain in auditing was conducted through the National University library. Databases accessed via Google Scholar included ProQuest, Emerald, SAGE, JSTOR, Cochrane Library, CINAHL Plus, ScienceDirect, ABI/INFORM Global, EBSCOhost, Business Source Premier, ACM Digital Library, IEEE/IET Electronic Library, and Elsevier. Keywords used in the searches included: *blockchain technology*, *financial accounting practice*, *blockchain for accounting*, *blockchain for auditing practice*, *impact of technology on auditing*, *technology use in auditing*, and *challenges of blockchain in auditing*. These search terms yielded 79 peer-reviewed scholarly articles, 90% of which were published within the past 5 years. The remaining sources consisted of books peripherally related to the topic and published before 2017.

Theoretical Frameworks

Two theories were used to guide this study and provide a lens for interpreting the findings: (a) AT and (b) ETAM. AT focuses on the "why" of accounting, offering the rationale behind reporting transactions in specific ways and providing a foundation for evaluating accounting standards (Secinaro et al., 2021). ETAM emphasizes that users' behaviors influence their acceptance of technology based on perceived ease of use, usefulness, and security.

Together, these theories provide a complementary framework for analyzing how blockchain technologies may be interpreted, adopted, and applied in the context of financial auditing.

Accounting Theory

Accounting theory was first conceptualized by Hendriksenin 1977 to provide a set of frameworks, assumptions, and methodologies that guide the study and application of financial reporting principles (Hendriksen, 1991). The origins of AT date back to the 15th century, when accounting first emerged as an academic field. This era also saw the conceptualization of other corporate accounting principles such as objectivity and consistency (Rohtak, 2004). Over time, AT underwent updates and revisions in response to shifts in accounting procedures. These developments can be attributed in part to the 1973 establishment of the Financial Accounting Standards Board (FASB), which was mandated to govern and update accounting standards (Rohtak, 2004). Certified Public Accountants (CPAs) have also assisted large organizations in adapting to these evolving requirements (Rohtak, 2004).

The practical application of AT is paramount in corporate finance; all financial statements should include material information that helps users make informed decisions about a company (Scott, 2015). AT provides the framework for reporting financial statements, which form the basis for the auditing process and are adaptable to global changes. The adaptability of AT continues to accommodate evolving practices in financial reporting alongside updates to regulatory frameworks. AT also forms the foundation for generally accepted accounting principles (GAAP) issued by the FASB. The evolving nature of AT has enabled GAAP to adapt to technological changes, incorporate new business practices, and identify gaps in reporting mechanisms. AT emphasizes that accounting data should be relevant, reliable, comparable, and consistent (Wolk et al., 2017). It implies that financial statements must be truthful and prepared in accordance with GAAP. Furthermore, AT stresses consistency in reporting financial statements over time and comparability across organizations.

Application in Research and Practice. AT has been extensively used in financial accounting research and practice, including its adaptability to changing legal and technological environments. For instance, Palmrose and Scholz (2004) used AT to examine factors contributing to market collapse due to numerous financial reporting irregularities. Palmrose and Scholz reported that revenue interpretations were the most common type of restatement among 492 U.S. firms that reported restatements of prior years' incomes between 1995 and 1999. This was in part because revenue recognition standards were broad and unspecific. For example, revenue from the sale of goods was recognized when the significant risks and benefits of ownership were transferred to the buyer, the seller had lost control of the items, the revenue and related costs could be accurately calculated, and collection was reasonably assured, as per International Accounting Standard 18 (IAS 18).

In practice, AT provides a framework for accounting for and reporting financial transactions. It has been used to develop new accounting procedures and practices. The theory is also useful in corporate finance by ensuring that financial statements report material information that allow readers to make informed investment decisions (Palmrose & Scholz, 2004). The flexibility of AT has facilitated the production of reliable, relevant, consistent, and comparable financial information, accounting for changes in legal, business, and technological environments. This affirms the contribution of AT to financial accounting research and practice in reporting the financial status of organizations.

Application in Planned Study. In the context of this study, AT can aid in understanding whether adapting blockchain auditing aligns with accounting principles and standards.

Technologies have transformed the field of financial accounting from handwritten ledgers to automated electronic spreadsheets. AT has been flexible in accommodating new technologies in the field of accounting to improve efficiency in financial reporting and auditing.

Extended Technology Acceptance Model

The second theoretical lens guiding this study was the extended technology acceptance model (eTAM). The original technology acceptance model (TAM) is a technology framework describing how people or organizations adopt new technologies. The model was derived from the Theory of Reasoned Action (TRA) in the 1980s to explain why individuals and organizations embrace technology to improve efficiency in business and personal contexts. TAM helped business managers evaluate factors influencing technology adoption (Malatji et al., 2020). The model identifies perceived ease of use and perceived usefulness as key predictors of acceptance (Davis, 1993). It was also designed to explain factors leading to the rejection of technology and eventually recognized positive drivers of acceptance. Davis (1993) further noted that TAM can highlight the effectiveness of technological acceptance. TAM has also provided insights into designing information systems that are more likely to be accepted and adopted by users.

Perceived usefulness refers to the degree to which an individual believes that adopting a specific system or technology will enhance their job performance (Davis, 1989, p. 320). Therefore, individuals are more likely to adopt technology if they believe it will make them more proficient or successful in their work. A greater sense of usefulness translates into higher adoption rates. Davis (1989) also defined perceived ease of use as the extent to which a person believes a given technology could be used with minimal effort. Technologies perceived as difficult to use are more likely to be rejected. This underscores the importance of user-friendly systems in promoting adoption.

The eTAM model was developed from the original TAM to capture additional external variables believed to influence technology acceptance in organizations. Patel and Patel (2018) extended TAM to include perceived security (PS) and social influence (SI) as critical factors in technology adoption, especially in cybersecurity-sensitive contexts. These additions complemented the original variables of perceived usefulness and perceived ease of use. The eTAM emphasized the importance of security due to rising cybersecurity threats. In financial accounting, security is essential to protect against potential cyber risks. Social influence addressed the role of peer influence, colleagues, friends, or family, on technology adoption (Patel & Patel, 2018). The integration of PS and SI has been demonstrated to significantly affect the likelihood of adopting technological solutions.

Application in Research. The eTAM has been applied in both academic research and practice. For example, Ejdys (2021) used it in the education sector to measure e-learning adoption at a Polish university. Input variables were analyzed to determine users' intention to adopt e-learning. The findings showed that perceived usefulness (PU) and perceived ease of use (PE) significantly influenced adoption. Constructs such as satisfaction and personal development also shaped users' attitudes toward e-learning. In healthcare, Klaic and Galea (2020) found that stroke patients were more willing to use technology for rehabilitation when they perceived it to be useful and easy to use. In education, J. Zheng and Li (2020) applied eTAM to explore what motivates students to use tablet devices for learning, confirming that perceived usefulness, ease of use, self-efficacy, and intention were key factors.

In practice, TAM has been widely adopted by technology companies to evaluate the likelihood of user adoption based on usefulness and ease of use (Manis & Choi, 2019). In the hospitality industry, TAM has guided the evaluation of user acceptance in implementing front-office systems (Kim et al., 2018). Thus, the model continues to prove valuable in academic research within information technology and in practical applications across various sectors.

Application in Planned Study. The purpose of this study was to explore the perceptions and experiences of auditors regarding the implementation of blockchain technology in financial auditing practice. The eTAM is applicable in this context to evaluate the adoption of blockchain technology in auditing. The model provided a lens for analyzing and interpreting the study findings based on four core components: perceived ease of use, perceived usefulness, social influence, and perceived security of blockchain. Each of these components served as a theoretical lens for data analysis and interpretation. The security aspect, in particular, was one of the defining features of blockchain technology and was also critically examined based on participant responses.

Review of Relevant Literature

The review of empirical literature relevant to financial accounting, auditing, and blockchain auditing is presented in this section. Key topics covered include the evolution of financial auditing, the impact of technology on auditing, the changing roles of accountants and auditors, and the frameworks governing technology use in financial auditing. In addition, the review covers the merits and demerits of using technology in auditing practice, the implementation of blockchain in financial auditing, challenges associated with blockchain use, its overall impact on audit practices, and perceptions of this impact within the auditing profession.

Evolution of Financial Auditing

Financial auditing has a long and complex history, with origins traceable to ancient cultures such as Mesopotamia, Egypt, Greece, Rome, India, and the United Kingdom.

References to accounting and auditing can be found in *Arthashastra* by Kautilya (Rangarajan, 1992). The formal practice of auditing began during the 18th-century industrial revolution, which introduced large-scale production and necessitated systems of checks and balances to manage public accounts. The original purpose of auditing was to document financial systems and business transactions. In contrast, modern auditing extends beyond financial areas to include security, safety, information system performance, and environmental sustainability.

The need for financial audits has increased with the rise of government agencies and nonprofit organizations tasked with demonstrating success in achieving their financial objectives (Roszkowska, 2021). Today, financial auditing serves as a tool for detecting and preventing financial fraud, as well as for safeguarding equity investments. The expansion of audit practices reflects the increasing demand for accountability across both public and private sectors.

Financial auditing has continuously evolved to keep pace with the changing business environment. Researchers such as Ajao et al. (2016) and Levy (2020) have examined this evolution in depth. Ajao et al. provided a comprehensive historical account, exploring how auditing has developed over time. They noted that financial crimes significantly affect the reliability of auditors' reports and remain a major challenge in both developing and developed economies in the information age.

Ajao et al. (2016) investigated whether traditional audit reports provide sufficient information for anti-graft agencies and whether the scope and content of these reports meet the expectations of financial statement users in the current era. The study examined various auditing theories, including quasi-judicial, credibility, inspired confidence, and policeman theories. Existing literature revealed an expectation gap between auditors and users concerning the level of assurance and content provided. It was argued that traditional audit reports lack sufficient detail to meet the information needs of anti-graft agencies and that traditional tools, particularly audit sampling, are inadequate for detecting fraud in today's data-driven context.

The study concluded that conventional auditors, unlike forensic auditors, are not proactive in detecting or investigating fraud, as they act as watchdogs rather than bloodhounds (Ajao et al., 2016; Kend & Nguyen, 2020). To address this limitation, it was recommended that conventional auditors acquire investigative skills and become familiar with forensic auditing techniques. The application of forensic auditing in corporate settings, which involves scrutinizing reported earnings and verifying underlying facts, could enhance investor confidence and the credibility of financial reports.

The practice of financial accounting and auditing has also been shaped by a changing business environment. Similar to the findings of Ajao et al. (2016), Levy (2020) examined how developments in the business world have influenced accounting and auditing practices. According to Levy, many view the 1950s and 1960s as the first major era of computing and technology in commerce. However, the introduction of computers initially had little impact on the auditing profession. Computers were first used to process business applications, employing punched cards and batch processing. Levy noted that auditors, through parallel processing techniques, compared machine inputs and outputs in a manner similar to auditing voucher files and ledger books in the early 1900s. Blockchain has since played a significant role in auditing's evolution. Many organizations are pursuing or have already adopted blockchain to support their audit processes (Tiron-Tudor et al., 2021b). Levy further observed that the development of modern auditing paralleled the rise of the CPA profession. The 1930s were pivotal years for developing audit standards, standard audit reports, and the recognition of GAAP's central role in public company auditing. These early developments, according to Levy (2020), remain significant and set the stage for subsequent progress in the field. Although auditing has improved, substantial challenges remain for future generations of auditors.

Changing technology and innovation have also reshaped financial accounting and auditing. In support of Ajao et al. (2016) and Levy (2020), Lindsay et al. (2019) emphasized that emerging technologies are rapidly transforming the financial reporting landscape. In a study examining technology, risk, and the auditor's role, Lindsay et al. asserted that auditors are now at the forefront of transformation, adapting their procedures to incorporate artificial intelligence (AI), robotic process automation (RPA), and blockchain. This underscores the importance of clear role definitions among auditors, audit committees, and management (Kokina et al., 2017; Lindsay et al., 2019). Traditional substantive procedures, such as tests of details or analytical procedures, may no longer provide sufficient audit evidence in light of emerging risks and evolving technologies (Lindsay et al., 2019). These developments emphasize the growing scrutiny of financial reporting and the pressure to modernize audit methods.

Financial Auditing. This section discusses various aspects of financial auditing, including definitions, technological impact, and the evolving role of auditors. Financial auditing serves as a cornerstone of accountability in modern business, ensuring that stakeholders can rely on the accuracy of reported financial information. It has also become increasingly dynamic, shaped by regulatory requirements, technological innovations, and the broader demand for organizational transparency.

Definition and Description. Financial auditing refers to the examination of an entity's financial records by a certified auditor to validate the credibility of its financial statements (Knechel et al., 2020). Daniela (2021) noted that although the word *audit* originates from the Latin *auditare* ("to listen"), the concept dates back to ancient Assyria, Egypt, and monarchs like

Charles I and Edward I of England. According to Jacques Renard, internal and external auditing emerged following the 1929 U.S. economic crisis, during which firms faced substantial losses (Daniela, 2021). All employer accounts involving tax or fee-generating transactions were scrutinized to identify overpayments or reduce taxable supply.

An audit of financial statements enhances user confidence. To that end, auditors express an opinion on whether financial statements are presented fairly, in all material respects, under the applicable financial reporting framework. This may include fair value assessments or compliance with a fair presentation framework (International Auditing and Assurance Standards Board [IAASB], 2020). Financial auditing remains essential in business management, serving as the foundation for analysis and decision-making.

Daniela (2021) affirmed the deep history of financial auditing, referencing the 2018 U.S. Government Accountability Office (GAO) financial auditing manual, which cited a revised 1999 definition by the U.S.-based Institute of Internal Auditors (IIA). That revision followed a study of 800 students overseen by Australian auditors (GAO, 2018). The updated definition described financial auditing as an impartial review of records and procedures that validates internal control and suggests efficiency improvements.

González-Díaz and García-Fernández (2018) echoed these views, emphasizing that audits help organizations achieve goals by evaluating risk management, controls, and governance. Ferri et al. (2020) and González-Díaz and García-Fernández emphasized that a financial audit is a third-party, expert examination providing both assurance and advice. Despite slight variations, the unifying theme across definitions is that financial audits guide businesses in goal achievement by systematically assessing and improving risk management and operational efficiency.

Auditing is typically divided into two categories: internal auditing and external auditing. Internal auditing plays a critical role in ensuring accountability in financial transactions and reporting, while also complementing external auditing practices. According to Hut-Mossel et al. (2021), when conducted effectively, an internal audit can enhance a business's productivity, profitability, and decision-making. For example, a corporation may perform an audit of its inventory system, where the auditor evaluates the tracking system to assess data reliability and identify the causes of any anomalies or delays.

Internal auditors are employees who specialize in reviewing their organization's finances, operations, and management practices. As such, their evaluations aim to be objective and free from internal political influence (Garanina et al., 2021; Hut-Mossel et al., 2021). Internal and external audits are complementary practices that contribute to effective organizational governance. However, they differ in purpose: internal audit findings are typically used by management, whereas external audit results serve stakeholders such as investors, lenders, and creditors.

Similarly, external auditors provide reasonable assurance that a company's financial statements are accurate and fairly presented in accordance with applicable standards. External auditors are responsible for verifying the credibility of financial reports. When a company becomes publicly traded, it must release audited financial statements to help investors make informed decisions. External audits also apply to nonprofit organizations that must demonstrate financial transparency to maintain tax-exempt status (Green et al., 2020).

Although privately held companies are not legally required to undergo regular external audits, some voluntarily do so to bolster client trust or support loan applications (Green et al., 2020). External audits are conducted by independent third parties with no vested interest in the audit outcomes. Although qualifications may vary, both internal and external auditors must typically be certified professionals. Importantly, auditors must also be aware of how advancing technologies affect financial auditing practices, as these innovations continually reshape audit methodologies and expectations.

Impact of Technology on Auditing. Technological change has influenced all professional sectors, and auditing is no exception. The accounting landscape is rapidly evolving to integrate and leverage emerging technologies. Auditors are updating their procedures to take advantage of innovations such as artificial intelligence (AI), robotic process automation (RPA), and blockchain (Lindsay et al., 2019). This transformation requires auditors, audit committees, and management to align their roles and responsibilities with emerging digital tools affecting financial reporting (Cristea, 2020).

Technology enhances the efficiency and reliability of financial reporting mechanisms, rendering traditional analytical procedures increasingly insufficient. Management now uses technology to strengthen internal control over financial reporting, particularly in response to changes in audit evidence standards (Lamboglia et al., 2021). One major benefit of advanced analytics in auditing is the reduction of reliance on sampling. Big data analytics enable auditors to evaluate entire data populations, thereby detecting patterns, anomalies, and risk factors more effectively (Thottoli et al., 2019).

Modern audit practices combine technologies such as AI, machine learning, robotics, big data, and visualization. These tools allow for more comprehensive and efficient testing than traditional audit methods, which relied heavily on limited data samples. The transition from sampling to full-population analysis represents a shift in both methodology and assurance quality. As financial environments grow increasingly complex, these technological integrations are becoming essential to maintaining audit relevance.

Blockchain technology is projected to significantly transform the audit process by improving the consistency between real-world events and recorded information. Compared to AI and RPA, blockchain may have even greater implications for the auditing profession. Brender et al. (2018) noted that blockchain has the potential to disrupt financial auditing, shift the field's focus from accounting to IT, and redefine auditor profiles to be more proactive and forward-looking. These changes could result in a more technology-driven and anticipatory auditing process.

This perspective was confirmed in an explanatory study by Dyball and Seethamraju (2021a), who examined the impact of client blockchain usage on audit risk and approach. They argued that blockchain would increase the trustworthiness of both external and internal audit evidence. Semi-structured interviews were conducted with 28 stakeholders, including audit partners, using the Australian Auditing Standard ASA 315 to identify and assess risks of material misstatement. Findings indicated that clients using blockchain were perceived as higher risk, with increased inherent and control risks.

The study highlighted two potential auditor responses: combining direct and indirect evidence at account and entity levels or assigning greater weight to indirect entity-level evidence. These findings illustrate how blockchain adoption affects audit strategy and risk assessment. More broadly, they underscore how new technologies not only introduce efficiencies but also shift professional judgment, requiring auditors to adjust their evaluation frameworks.

Further support for these conclusions comes from Demirkan et al. (2020), who reviewed current and future blockchain applications in business, particularly in accounting and cybersecurity. Their literature study connected blockchain technology to key issues in cybersecurity and financial reporting. Topics included blockchain's potential for tracking financial misconduct, its integration with big data, and its role in financial and cybersecurity frameworks. These aspects illustrate blockchain's multidimensional impact on organizational infrastructure.

Demirkan et al. (2020) also analyzed the Department of Homeland Security's four-year cybersecurity strategy, emphasizing the importance of blockchain's role in securing financial systems. Their research concluded that blockchain could improve audits, cybersecurity, and general accounting practices (Demirkan et al., 2020; Gaur, 2020). Thus, blockchain not only influences audit methodology but also enhances broader business cybersecurity. The convergence of accounting, cybersecurity, and blockchain demonstrates the expanding scope of auditing in the digital age.

A study by Nathalie et al. (n.d.) explored the potential impact of blockchain technology on audit practice, offering support for the earlier findings of Demirkan et al. (2020). Nathalie et al. began by noting that audit and control professionals are often absent from broader discussions about blockchain's disruptive potential, despite the technology's valuable features such as transparency, traceability, immutability, and the integration of rules into system architecture. Smart contracts and public registers are among the applications that, when combined with technological advances and process innovations, may radically transform the audit and control landscape (Cong & He, 2019). To examine these effects, Nathalie et al. conducted a grounded theory study involving auditors in Switzerland. Although three hypotheses were developed, the study found that the profession lacks clarity about blockchain's full impact and that smaller audit firms are unprepared for this technological disruption.

One of Nathalie et al.'s (n.d.) key conclusions was that a paradigm shift is emerging in the audit profession. The field is becoming more aligned with information technology and increasingly future-oriented rather than retrospective. Blockchain is changing how auditors approach prospective financial analysis and influencing the tools and outlooks they use. These findings underscore the broader transformation occurring within the profession and the growing importance of integrating IT competencies into traditional auditing roles.

Blockchain's ability to eliminate tedious manual work and repetitive tasks has been highlighted by major accounting bodies. The PCAOB (2017), in collaboration with firms such as Deloitte, revealed that blockchain tools could improve audit processes by automating time-consuming tasks. For instance, AI and robotic equipment could interface with client systems to collect and transmit data automatically. Technologies like drones may also be deployed for physical inventory verification, thus creating additional efficiencies (Hojckova et al., 2020). These changes would allow auditors to dedicate more time to complex, high-risk areas that require greater professional judgment.

The Public Company Accounting Oversight Board (2017) further noted that the integration of advanced analytics will enhance auditors' understanding of their clients' business models. By comparing client trends to industry or regional datasets, auditors could make more informed judgments. The article emphasizes that blockchain's potential extends beyond efficiency; it fundamentally strengthens the quality and depth of audit insights. These enhancements are not merely hypothetical but are already shaping audit practice in forward-looking firms.

Blockchain also offers cost advantages, increased efficiency, enhanced transparency, and the ability to generate an immutable audit history of transactions (White et al., 2020). However, Vincent et al. (2020) cautioned that the benefits of blockchain can only be realized if its architecture supports secure, effective network integration. The system must ensure that CPA firms can access reliable audit information and that client organizations maintain data confidentiality within the distributed ledger. Blockchain technology's immutable design sets it apart from traditional systems where financial records can be altered or deleted. Still, as with all technologies, blockchain carries inherent risks, including data security threats, interoperability issues, and vendor dependency.

To fully harness blockchain's capabilities, auditors must be equipped with a strong understanding of its architecture and risks (White et al., 2020). Assurance services in a blockchain environment require technical expertise as well as traditional audit knowledge. The shift to blockchain-integrated auditing thus has the potential to change both the profile and the role of the modern auditor.

Changing Role of Accountants and Auditors. Blockchain has also reshaped the roles of accountants and auditors, particularly through the adoption of triple-entry accounting. In this system, each transaction results in three entries: a debit, a credit, and a cryptographic signature verifying transaction integrity (Moll & Yigitbasioglu, 2019). Blockchain acts as an impartial, decentralized intermediary that automates data storage and validates transactions. This platform not only enhances the security of accounting records but also limits opportunities for tampering and fraud.

Both intra-organizational financial activities and external transactions, such as payments and deposits, are stored on the blockchain. As a result, verifying blockchain transactions may become a core function of accountants (McGuigan & Ghio, 2019). Based on these developments, Yermack (2017) speculated about broader implications for the accounting profession. He argued that although blockchain would reshape how financial information is recorded, accounting functions will not disappear. Instead, professionals will be expected to take on new responsibilities that blend traditional skills with emerging technological competencies.

For example, strong IT literacy may become a prerequisite for accountants in firms adopting blockchain-based systems (Uwizeyemungu et al., 2020). Although these changes are not expected to occur overnight, blockchain's classification as a "foundational technology" suggests its long-term significance. As businesses integrate blockchain, the profession will likely see shifts in how accounting and auditing functions are performed, evaluated, and understood. Accountants will retain essential roles but will need to adapt to evolving expectations and tools.

The possibility that accountants' roles may extend beyond recording transactions represents a significant transformation within the profession due to blockchain technology. In the future, accountants may be required to exercise professional judgment in real-time as they engage in accounting tasks (Iansiti & Lakhani, 2017). Even if blockchain automates the recording and storage of basic accounting data, decisions such as depreciation and amortization methods, asset lifespans, inventory valuation policies, and fair-value accounting assessments will still require expert judgment. Additionally, the increasing use of initial coin offerings (ICOs) and crypto-assets may compel accountants to develop advisory skills to properly classify and report these new asset classes (Lev & Gu, 2016).

If blockchain is widely adopted, accountants may also need to interpret larger datasets for planning and strategic management purposes. This will shift their role, especially for management accountants, who may become more visible as advisors contributing to strategic decision-making. Their function could expand beyond back-office reporting into forward-facing roles involving analysis, communication, and alignment with company operations. Accountants would thus serve as agents of intelligence, linking operational data with organizational goals.

Blockchain may also increase transparency in non-financial disclosures, such as sustainability and corporate social responsibility (CSR) reporting. Its transparent nature could encourage businesses to offer more detailed explanations of non-financial performance. To counterbalance traditional financial metrics, organizations may choose to disclose "feel-good" information that demonstrates their societal contributions (Smith, 2017). Blockchain's ability to collect and verify high-quality social and environmental data opens new opportunities for automatic assurance systems.

La Torre et al. (2018) argued that blockchain could significantly alter how non-financial assurance is conducted. They suggested that blockchain may lead to new accounting frameworks that go beyond traditional assumptions such as monetary units, economic entities, or standard periods. As information asymmetry decreases, decision-making could improve. The ability to store quantified non-financial data on blockchain systems may foster greater collaboration between accountants and other governance bodies. This development points to a more holistic approach to organizational accountability and performance reporting.

Legal Framework for Auditing Technology. Legal frameworks are essential in regulating the adoption and use of technology in auditing practice. As technology continues to permeate accountancy and auditing, new legislative initiatives have emerged to address these developments, particularly between 2018 and 2020 (Kamble et al., 2020). Regulatory sources vary and may include local, national, and international bodies. Some of the major international and professional bodies contributing to auditing regulation include the International Federation of Accountants (IFAC), the UK Financial Reporting Council (FRC), the Institute of Chartered

Accountants in England and Wales (ICAEW), the Association of Certified Public Accountants (ACCA), and the Chartered Institute of Management Accountants (CIMA; Napley, 2019).

To address rapidly evolving technological shifts, IFAC appointed the International Ethics Standards Board for Accountants (IESBA) in 2018 to form a new Technology Working Group (TWG). This group's mission was to explore strategic approaches to regulating technological advancements affecting the audit profession. The TWG’s Phase 1 report was released in December 2019 after consultations with stakeholders, including UK regulators. These developments underscore the increasing urgency to regulate emerging technologies in the audit space to ensure ethical compliance, professional accountability, and operational security.

The importance of a legal framework in managing technology use in auditing lies in its ability to protect key stakeholders and ensure consistent practices. This point is reinforced by Elommal and Manita (2022), who conducted a qualitative study on blockchain’s potential effects on the auditing profession. Their research found that blockchain is not only changing how financial data is recorded and stored but also transforming operational workflows within audit firms. Surveying 17 auditors, they identified six potential benefits of blockchain: time savings, full-population testing, a focus on control testing, continuous audit implementation, more strategic audit roles, and the creation of advisory services.

These findings emphasize the need for updated auditing standards and a regulatory framework that accommodates technological shifts. By integrating blockchain into auditing protocols, firms could elevate audit quality and broaden their service offerings. Gauthier and Brender (2021) also explored how blockchain affects audit and reporting processes. They conducted a content analysis to assess auditors’ perceptions of whether current standards adequately address blockchain integration. Their findings highlighted a temporal gap between the rapid pace of technological change and the slower development of updated auditing standards.

Gauthier and Brender (2021) concluded that there is a rising need for IT-specific auditing standards. Their study supports the argument that existing frameworks lag behind technological developments, creating risk and uncertainty in the audit process. Both studies illustrate the critical need for responsive and future-oriented regulatory guidance in the auditing profession. As blockchain adoption increases, the alignment of auditing standards with new technological capabilities becomes essential.

Merits and Demerits of Using Technology in Auditing. The use of technology in auditing offers numerous benefits, which outweigh the potential drawbacks. Studies by Dai et al. (2019) and Dal Mas et al. (2020) affirmed that major accounting firms are utilizing a variety of technological tools to improve audit quality by automating tedious and manual processes. For instance, artificial intelligence (AI) and robotic systems can interface with client infrastructures to collect and synthesize data automatically, tasks traditionally handled by junior auditors. Big data analytics has further eliminated the limitations of audit sampling by enabling the analysis of entire data populations to detect trends, risk areas, and anomalies in financial reporting (Thottoli et al., 2019).

Technologies like drones also enhance efficiency by facilitating physical inventory observations and automating routine confirmations. These innovations allow auditors to allocate more time to complex, high-risk areas that require greater professional judgment and involve significant estimation uncertainty (Hughes et al., 2019). As auditors conduct more advanced analytics, they gain deeper insights into client operations. This supports more accurate trend and risk analysis, leading to more informed assessments during the audit process. Consequently, the application of technology has become a strategic tool for audit firms aiming to streamline operations and improve effectiveness.

Blockchain technology specifically contributes to improved efficiency, cost advantages, and immutable audit trails (White et al., 2020). Dai et al. (2019) and Dal Mas et al. (2020) also found that blockchain enhances financial data security and makes audit processes more effective. Dai et al. conducted a study to examine how blockchain and smart contracts can facilitate "Audit 4.0," especially in the context of environmental accountability in China. Their model incorporated Industry 4.0 tools like smart sensors and the Internet of Things to support real-time auditing of government actions on air pollution. Blockchain validated crowd-sourced air quality data, while smart contracts continuously audited the performance of government officials.

The study proposed a structure outlining areas where blockchain and smart contracts could be deployed to implement this advanced audit model. The integration of blockchain into audit practices helped ensure continuous monitoring and accountability. Bodkhe et al. (2020) supported these findings, arguing that real-time monitoring and decentralized verification technologies are driving the next generation of auditing. As audit complexity grows, the use of these tools becomes increasingly essential to ensure transparent, efficient, and reliable outcomes.

Blockchain and Sustainable Business Models. The findings by Dal Mas et al. (2020) reinforced those of Dai et al. (2019), showing that blockchain supports the development of sustainable business models (SBMs). According to Dal Mas et al., emerging technologies, including blockchain, can foster innovation in business, society, and the economy. Their research evaluated use cases that demonstrated how blockchain extends existing sustainability theories by enabling new SBMs. Initial investigations into technology focused on improving firm profitability and stock value. However, more recent studies have emphasized technology's broader role in promoting sustainability (Dal Mas et al., 2020; Mancini et al., 2021).

The unique properties of blockchain, such as immutability, decentralization, and real-time verification, support the development of business models that are transparent and socially responsible. Dal Mas et al. (2020) concluded that the strategic application of blockchain can encourage long-term organizational change. These insights help explain why firms are investing in digital infrastructure not only for efficiency but also to enhance their ethical and environmental credibility. Blockchain enables this by embedding accountability into the system itself, reinforcing both financial and non-financial performance metrics.

These studies underscore that using technologies in accounting and auditing is fundamental to achieving faster, more accurate, and more efficient audit outcomes. In particular, blockchain enables the kind of traceability and auditability that manual systems cannot provide. This elevates the audit profession and aligns it with global standards for governance, transparency, and stakeholder trust. As firms continue to digitize their processes, the use of these advanced tools is becoming the new norm in professional audit practice.

One of the most valuable features of blockchain in auditing is the immutability of its records. Once a transaction is validated and added to the blockchain, it cannot be reversed or altered. This immutability fosters trust among all parties involved in financial transactions, as it guarantees the completeness and accuracy of records (Yu et al., 2018). Because blockchain is decentralized, all network participants have simultaneous access to updated ledgers, increasing transparency across the board. This could give firms adopting blockchain a competitive advantage and promote higher levels of trust among investors and other stakeholders.

Another benefit is that blockchain does not rely on a centralized authority to verify transactions. Instead, every node on the network plays a role in maintaining the integrity of the system. This structure protects against single points of failure and reduces the likelihood of fraud. As Wang and Kogan (2018) noted, blockchain's resilience to internal collusion and data manipulation is unmatched by traditional systems. Businesses implementing blockchain may experience fewer fraudulent activities and more secure financial reporting.

Additionally, blockchain can enhance audit quality by automating transaction processing, reducing data loss, and improving transaction tracking. Fullana and Ruiz (2021) argued that these benefits allow auditors to effectively increase efficiency while maintaining accuracy in their assurance procedures. Blockchain enables built-in accountability that reduces audit risk and supports continuous assurance. The primary distinction between blockchain and traditional databases lies in their novel control approach: transactions are irreversible and cannot be tampered with after validation.

Although the integration of technologies into auditing practices presents numerous advantages, it is not without significant drawbacks. Studies such as Liu et al. (2019) have highlighted key limitations and risks associated with implementing technology in auditing environments. Liu et al. explained that technologies used in auditing often come with high implementation and maintenance costs, particularly for computer-assisted audit tools. Additional challenges include the limitations of simplified accounting software, overemphasizing certain types of investigations, and the stringent requirements for managing client databases effectively.

Financial auditing has evolved, adopting various tools and frameworks; however, technology introduces a new level of complexity (Hickman, 2017; Karajovic et al., 2019). Liu et al. (2019) noted that blockchain's unique method of recording, processing, and storing financial data could lead to significant changes across the business and accounting landscape. Their study offered a technical comparison of permissionless and permissioned blockchain models, evaluating their advantages and drawbacks. Although blockchain holds promise, it also introduces risks like data security vulnerabilities, technological instability, interoperability issues, and third-party dependencies.

Despite these risks, Liu et al. (2019) proposed strategies for auditors to evolve alongside blockchain's rise. Their suggestions included building auditor competencies in blockchain systems and adapting auditing practices to align with the technology's structure. Although challenges exist, feasible solutions exist for minimizing or eliminating the associated risks. This balanced perspective supports a cautious but optimistic approach to adopting technology in audit work.

Serpeninova et al. (2019) and Chaudhary (2022) provided additional insights into the limitations of audit technology. Serpeninova et al. conducted a qualitative study exploring the pros and cons of computer-assisted audit techniques (CAATs), particularly when using blockchain. These methods require auditors to access and interpret client data files directly. However, using CAATs is often hindered by software complexity, high costs, and compatibility issues across various hardware systems.

The audit process may also require the use of specialized tools, such as database analyzers, to verify licensing and application access. In many cases, the auditor must create both actual and fabricated data to simulate real-world transactions and verify audit software performance. This process can be labor-intensive, especially if the tools are not versatile or broadly applicable. Chaudhary (2022) concurred with these concerns, adding that CAATs are often limited in their ability to interact with various database management systems.

Additionally, auditors may be reluctant to use real client data for testing, fearing that it could distort results or breach confidentiality. The online testing methods also restrict the auditor's flexibility, as a single tool may only be suited to one narrowly defined task. Although technologies like blockchain present an exciting future for auditing, their successful implementation depends on overcoming these very real technical and procedural hurdles. Accountants must prepare for these challenges through training and developing new audit models that accommodate technological change.

Blockchain in Auditing Practice

Blockchain has emerged as a transformative technology with implications for how audits are conducted and evaluated. In auditing practice, blockchain promises to improve transparency, enhance recordkeeping, and streamline verification processes. This section introduces two aspects of blockchain in auditing: first, an overview of the technology itself, and second, its implementation in professional practice.

Blockchain Technology Overview. Blockchain is an internet-based peer-to-peer network of independently connected nodes that enables real-time, secure, and decentralized transactions (White et al., 2020). It is an advanced database mechanism allowing for transparent information sharing across a network (Justinia, 2019). Data within a blockchain system is stored in blocks that are chronologically linked, forming an immutable chain of records. Although blockchain is most commonly associated with finance, its applications extend into various sectors, including healthcare, logistics, and scientific research.

Justinia (2019) explored the technology's potential in solving real-world problems, particularly in the biomedical and healthcare sciences. Blockchain's distributed ledger system was shown to be valuable for maintaining longitudinal patient records, automating insurance claims, improving pharmaceutical supply chains, and enhancing data security. According to Chen and Bellavitis (2020), blockchain's functionality is comparable to the disruptive impact of TCP/IP on the internet, enabling new levels of interoperability and data transparency.

Cockcroft and Russell (2018) added that healthcare institutions are actively monitoring blockchain’s potential for applications like secure patient IDs, although mainstream adoption remains limited. Nonetheless, interest in blockchain’s transformative potential continues to grow, especially regarding its ability to create community-wide, open-source, trustworthy ledgers. Justinia (2019) concluded that blockchain is transforming how large-scale data is managed and accessed, with high integrity and real-time capabilities.

Accounting, auditing, and reporting are undergoing significant restructuring due to emerging technologies and digital transformation (Marrone & Hazelton, 2019). Over the past two decades, numerous studies have explored how automation, big data, cloud computing, social media, and artificial intelligence are reshaping the accounting profession. Among these technologies, blockchain has emerged as a disruptive force, capable of transforming core procedures within management control, accounting, auditing, and reporting systems. Blockchain is a decentralized digital ledger shared across multiple peers in a network to record transactions and track the ownership of real and virtual assets.

Through cryptographic signatures, approved transactions are represented as blocks appended to a chronological chain of previously validated blocks (Bonson & Bednarova, 2019). Due to the distributed structure of the ledger and the fact that each block is timestamped and linked to the preceding block, tampering with the blockchain would require altering every block in the chain. Although blockchain is widely known as the technology behind Bitcoin and other crypto-assets, increasing attention is paid to its potential in sectors beyond finance. Its possible applications include decentralized finance, nonfungible tokens (NFTs), and smart contracts, which are digital agreements that automatically enforce pre-defined rules (A. Rozario & Vasarhelyi, 2018).

Recent reports by Big Four firms, such as Deloitte (2020), have suggested that blockchain innovations will significantly affect accountants, auditors, and regulators. These innovations will impact processes related to how transactions are initiated, processed, recorded, reconciled, audited, and reported (Schmitz & Leoni, 2019). Despite the growing discourse on blockchain's potential business applications, its implications for accounting, auditing, and reporting remain an under-researched area. As a result, blockchain continues to represent an emerging research theme within these fields.

Implementation. According to Kahyaoglu (n.d.), blockchain implementation depends on customer specifications, such as whether the network is public or private. In a public blockchain setup, the implementation process generally includes three major steps: decentralization, authentication, and development of a tamper-resistant framework. At the outset, decentralization ensures that all nodes in the network can view the complete transaction history. A centralized data repository becomes unnecessary with a distributed ledger like blockchain (Androulaki et al., 2018).

Decentralization enhances system security by making unauthorized access and data manipulation extremely difficult. In decentralized networks, individuals can conduct secure and private online transactions without compromising personal information (Kamen, 2018). Nodes, defined as centralized storage locations accessible to multiple users, serve as information access points (Clincy & Shahriar, 2019). Every participant in the blockchain network maintains a copy of the distributed ledger, and each transaction represents a value exchange between users. In this context, "value" can include digital assets signifying rights, obligations, or ownership.

Once decentralization is achieved, authentication is enforced through consensus among network users. Blockchain authentication requires most users to validate any new transaction or block before it can be added to the ledger (IMS, 2018). This verification mechanism not only protects the ledger's integrity but also supports secure identity authentication. The process is governed by a "consensus algorithm," a rule-based system for determining which version of the ledger is deemed authoritative (Deloitte, 2018). Without such a rule, agreement within the network would be impossible.

Finally, a tamper-proof architecture is established for the blockchain system. This infrastructure removes the need for a centralized root of trust or a Public Key Infrastructure (PKI) at the application level, mitigating the risk of spoofing attacks in HTTPS communications (Hari & Lakshman, 2016; McAliney & Ang, 2019). Any attempt to update a block requires the creation of a new block that references the original, making it impossible to alter the chain without regenerating all subsequent blocks. This structural design ensures a high level of protection against data manipulation.

An alternative blockchain implementation strategy, as proposed by Regueiro et al. (2021), focuses on building an audit trail mechanism architecture. This mechanism is built through smart contracts embedded in a blockchain network to leverage blockchain's inherent properties. Regueiro et al. examined how blockchain's security features could be used to produce secure, tamper-resistant audit trails, addressing traditional shortcomings in audit log integrity. They emphasized that audit logs are essential components of modern business systems, providing verifiable evidence for the accuracy of transactions and the protection of confidential data.

Regueiro et al. (2021) identified the creation of blockchain infrastructure as the first critical step for widespread adoption. They explained that all data submitted to the audit trail is stored across all nodes in the blockchain, ensuring the integrity, legitimacy, and long-term preservation of that information. Consequently, neither the audit system's operations nor the records it generates can be altered, making them fully trustworthy. The next stage involves creating and coding smart contracts, which must be securely executed and verifiable across all blockchain nodes (Ljunggren, 2019; Regueiro et al., 2021).

Blockchain can support various audit functions, including the registration and consumption of auditable data for verification purposes. These actions generate blockchain-based events to be processed by a blockchain observer system. Users then join the network as clients, with each blockchain client deployed as a portable and compatible docker image. This client provides a representational state transfer (REST) application programming interface (API). Regueiro et al. (2021) also proposed a blockchain monitor, similar to the tamper-proof infrastructure suggested by Kahyaoglu (n.d.), to observe and sort smart contract events for the blockchain observer client (Cong & He, 2019). Notably, even users without a blockchain account can access data recorded on the ledger through this monitoring system.

Challenges of Blockchain in Auditing Practice

Despite its potential, blockchain technology presents several challenges for auditing practice. As Z. Zheng et al. (2018) noted, auditors now face a market where blockchain is becoming ubiquitous across industries. Auditors must invest significantly in acquiring technical expertise to keep pace with client expectations. Failure to do so could result in losing ground to firms specializing in digital audit services. To stay competitive, audit firms need to hire professionals with strong technological skills and reconfigure internal processes to support continuous auditing capabilities.

Another challenge lies in designing effective blockchain architecture. Vincent et al. (2020) stressed that blockchain systems must facilitate secure connectivity while allowing CPA firms to access reliable, real-time audit data. These systems must also protect data confidentiality in an immutable, distributed ledger. Although these design goals can be achieved, they require thoughtful infrastructure planning and ongoing governance. Still, blockchain has already demonstrated substantial impacts on accounting since its early applications in audit contexts.

Pimentel et al. (2021) explored barriers to auditing blockchain-based organizations through interviews, focus groups, and structured brainstorming with audit and blockchain professionals. Their findings revealed that many audit firms are reluctant to serve clients holding significant crypto-assets due to perceived technical and regulatory risks. This hesitance has led to delays in financial reporting and, in some cases, resulted in cease-trade orders by regulators, which hindered firms from attracting capital (Pimentel et al., 2021; Wang et al., 2021). These realities have prompted calls for auditors to re-evaluate their opposition to engaging with blockchain-intensive clients.

One of the major obstacles to blockchain adoption in auditing is poor governance. Governance encompasses how responsibility, decision-making, and information flow are structured within organizations. According to Rikken et al. (2019), inconsistent blockchain protocols and lack of standardization have been significant roadblocks to widespread adoption. Yadav et al. (2020) similarly argued that regulatory ambiguity discourages investment and operational integration of blockchain technologies.

Without efficient and adaptive legislation, many nations remain slow to embrace blockchain, limiting its effective application. Yadav et al. (2020) reported that stakeholder hesitance often stems from unclear regulatory environments, a lack of confidence in the system, and insufficient guidance from government bodies. Challenges such as scalability, legal accountability, and limited public awareness further compound governance issues.

A specific concern involves transparency in smart contract code. Because smart contracts automate financial transactions, stakeholders must trust in the code's reliability and security. When governance systems fail to enforce accountability, the credibility of blockchain technology suffers. The absence of a responsible regulatory entity poses a risk to effective blockchain implementation. Therefore, for blockchain to reach its full potential in auditing, governance models must evolve to include transparency, standardization, and institutional accountability.

Significant governance obstacles included a need for more attractive distributed ledger-based apps, governance ambiguity, difficulties complying with new rules and laws, and legal issues. Managing conflicts, preventing tax evasion, and figuring out how to comply with a patchwork of regulations are all examples of problems that can be included under the umbrella term "governance" (Kwok & Koh, 2019). The government's reluctance to adopt blockchain technology has stymied certain attempts at deployment. Experts and professionals are less likely to adopt blockchain technology if the government does not provide clear incentives and rewards for successful deployments of blockchain systems.

Although the lack of standardization hinders blockchain adoption in most developing nations, China's Blockchain Services Network (BSN) appears to be a more advanced standardization initiative thanks to its government backing (Toufaily et al., 2021). China's goal in this venture is to create a market for non-fungible tokens (NFTs) distinct from cryptocurrencies and to increase the use of the digital yuan, the country's official digital currency (Saheb & Mamaghani, 2021). Standardization, as is with the case of the efforts by countries like China, is, therefore, important to solve the issue related to blockchain governance.

Several studies have also highlighted and addressed organizational and environmental issues for successfully adopting and deploying blockchain systems (Dutta et al., 2020; Lu et al., 2020; Kouhizadeh et al., 2021). Challenges faced by organizations included those associated with readiness, inter-organizational connections, management lifecycle, business process, status quo thinking, lack of compelling apps, uncertain return on investment (ROI), inability to integrate with the existing legacy system, absence of a disruptive business model, misalignment of the business model, inadequate infrastructure, lack of data integrity and trust, and reluctance to adopt blockchain (Kouhizadeh et al., 2021).

An organization's culture shapes how workers conduct themselves on the job and how they interact with partners in the business world (Kouhizadeh et al., 2021). As Kouhizadeh et al. (2021) found, resistance to change in corporate culture might be a roadblock when it comes to introducing blockchain technology. An important barrier to blockchain adoption is the need for organizations to change or modify existing systems. Additional environmental problems included ecosystem preparation, laws and regulations requirements, marketing noise of misunderstanding and mistrust (blockchain's credibility), political resistance, environmental expense, and intellectual property worries.

Impact of Blockchain on Auditing Practices

Blockchain presents multiple benefits and a few challenges when integrated into auditing practices. Brender et al. (2018) found that blockchain technology has the potential to disrupt the financial auditing practice, causing a paradigm shift in the auditing profession to make become more IT and less accounting oriented and also more forward than backward-looking and prospectively change the profile of auditors. If implemented, blockchain technology could lead audit firms to create opportunities to develop new services and destroy existing services, which will be totally or partially replaced by technological systems (Dyball & Seethamraju, 2021a; Elommal & Manita, 2022).

Aware of this technology's very significant development potential, audit firms are investing more than $3 billion a year in it (Elommal & Manita, 2022). For example, Ernst and Young (EY), the first firm to accept Bitcoin for its consulting services in 2017, has invested in developing applications and services to facilitate the use of blockchain technology in its business. KPMG has launched new blockchain-based services with its partner Microsoft to assist companies in implementing business processes (Elommal & Manita, 2022). Deloitte created the first blockchain lab in 2016 and PWC Inc. launched digital asset services in 2016 using blockchain technology. Despite there being advantages of applying blockchain technology in the auditing process, different auditors have expressed varying perceptions regarding this new approach to accounting.

Today, when the IT environment is simple, financial auditors who are not IT professionals and who are not trained in auditing information systems can undertake IT audit work by following a predetermined audit program (Kamath, 2018; McCallig et al., 2019). An expert review by Appelbaum and Smith (2018) aimed to examine blockchain basics and hands-on guidance reveals that blockchain technology is a prime example of a sophisticated technology due to its use of its two primary technological elements, asymmetric cryptography, and distributed systems.

According to Appelbaum and Smith (2018), most financial auditors and even many IT auditors need a firm grasp of the topic. This claim is founded on the fact that most financial auditors have never used blockchain in a real-world setting or know how to conduct an audit of a blockchain system. Most auditors have also expressed concerns that a blockchain-specific auditing standard has yet to be. They are unfamiliar with the technology, implying that audit firms should train their staff in this area.

In this light, 82% of audit respondents think that practicing and aspiring financial and IT auditors need greater technical and technological expertise (Appelbaum & Smith, 2018). According to Appelbaum and Smith (2018), for audit companies to reap the benefits of new technologies and cater to the needs of their clients, they will need to hire additional IT auditors and new profiles like analytical specialists, data scientists, and statisticians. If this trend continues, it will have a significant effect on auditor training as well as the structure and composition of audit teams.

Certified public accountant (CPA) test candidates today can indeed take classes in accounting, financial analysis, taxation, and even information technology audits (Rapoport, 2018). In any case, if auditors go from verifying the accuracy of financial data to verifying the accuracy of blockchain, they will need to be familiar with the technology's two primary uses (asymmetric cryptography and distributed systems; Organization for Economic Co-operation and Development [OECD], 2018). In addition to developing their technical abilities in computer programming, hashing, and cryptography, they must keep honing softer skills like interpersonal communication.

To check the legality of smart contracts used by auditees to carry out predefined conditions in blockchain automatically, auditors need first to comprehend the underlying code and then communicate effectively with lawyers. A CPA study is thus another area of accounting and auditing that has been affected by technological use and growth in business. Furthermore, large and medium-sized firms must hire data scientists or train existing auditors to evaluate and interpret the data correctly. They use computer-based technologies capable of processing and analyzing enormous volumes of data to meet auditing criteria.

Accordingly, it appears critical to evaluate educational programs in light of changing requirements (Sheldon, 2018). It is also worth noting that audit teams will be reorganized differently. In the future, teams will be headed by an auditor who is well-versed in accounting and finance and has a firm grasp of technology (Sheldon, 2018). This person will work closely with IT auditors and other specialists (such as those versed in accounting, tax, data visualization, blockchain, and big data).

Despite the increasing sophistication and complexity of IT infrastructures, the literature suggests that the value of the IT auditor function in an audit could be more conveyed indirectly. The makeup of audit teams may shift if audit firms hire individuals with a broader range of capabilities, such as more IT auditors (Sheldon, 2018; Stratopoulos & Wang, 2019). To ensure audits are of higher quality and as efficient and effective as the use of new technology seems to imply that studies in the auditing field suggest teams should evolve toward greater interaction, better integration of IT audit work, and smoother communication between financial and IT accountants on the one hand and other specialists on the other.

Perceptions Regarding the Impact of Blockchain on Auditing Practices

The general perception about the contribution of blockchain technology to the field of accounting and specifically to auditing practices is that the technology has helped to streamline and lessen the burden and risks associated with auditing. According to a study by Parmoodeh et al. (2022), for example, auditors have indicated that the audit budget time could be decreased with the help of blockchain technology in the long run. In this article, Parmoodeh et al. (2022) conduct an exploratory study of the perceptions of auditors on the impact of blockchain technology in the United Arab Emirates.

The researchers investigate the potential impact of blockchain technology (BCT) on auditing. Professional auditors were interviewed using a semi-structured format, and their comments were analyzed thematically. Important conclusions were drawn with respect to the three primary subjects investigated: audit practice, audit procedures, and the difficulties in implementing BCT. There may be some changes to standard auditing practices necessitated by the introduction of BCT. Respondents were confident that BCT would upgrade Audit 3.0 to 4.0. For example, a shift toward an automated verification procedure may improve external confirmations. Further, this technology can potentially shorten the duration of audit budgets in the long run (Bellucci et al., 2022; Parmoodeh et al., 2022). This technology has the potential to reduce the requirement for physical observation by keeping tabs on observations in real time.

With the ability to include multiple analytical instruments at once, blockchain technology has the potential to streamline analytical processes. In addition, because it creates an unalterable audit trail, it has the potential to cut down on fraud detection costs drastically. The need for physical observation could be diminished because of this technology, as it could track observations on a real-time basis (Austin & Williams, 2021; Bonson & Bednarova, 2019; Calderon & Stratopoulos, 2020). This technology could also facilitate analytical procedures, as it has the potential to incorporate other analytical tools simultaneously. Furthermore, it could reduce the costs associated with fraud detection to a great extent, as it provides a tamper-proof, immutable audit trail.

In another study by Nathaniel (n.d.) that aimed to examine the potential impact of blockchain technology on audit practice, the author notes that there are scholars who have indicated doubt regarding the ability of the technology to solve auditing activities. They make statements like: “We believe that because blockchain technology and the development of auditing and control standards are not envisioned in an integrated way, the potential impact of blockchain on audit and control professions has not yet been systematically and thoroughly assessed” (Nathaniel, n.d., p. 24). Because of the ability of AI in streamlining the ability of online users to surf the internet, the internet has been largely deployed for use in boosting service quality.

Summary

The literature review section identified and justified the applicability of two theoretical frameworks to the planned study. The AT and eTAM were considered appropriate in guiding the planned study. In the context of this study, AT could aid in understanding whether adapting blockchain auditing aligns with accounting principles and standards. The Extended TAM is applicable in this context to measure the adoption of blockchain technology in financial auditing practices.

Empirical works of literature were also reviewed in pertinent areas of significance to the planned study. Financial auditing has undergone various levels of evolution to become what it is currently. The evolution process of financial accounting was shaped by changing business environment and has become a tool for detecting and preventing financial fraud and safeguarding equity investments. It is demonstrated in available scholarly works that financial accounting and auditing practice is shaped by changing business environment, including changing technological landscape. In response, the accounting landscape is rapidly and significantly changing to align with and leverage the use of emerging technology.

In particular, the reviewed pieces of literature have shown that blockchain technology is projected to transform the auditing process by improving consistency between the real world and blockchain information. Blockchain technology has the potential to disrupt the financial auditing practice, cause a paradigm shift in the auditing profession to make become more IT and less accounting oriented, and also more forward than backward-looking and prospectively change the profile of auditors. Blockchain has also had a significant impact on the role of accountants and auditors and called for closer collaboration between accountants and other decision-making bodies.

However, although there has been improvement in auditing over the years, there are still significant issues that will present significant challenges to the next generation of auditors. Section Three discusses and justifies research methodologies that were followed in conducting the planned study to explore the perception and experience of auditors regarding the adoption of blockchain in auditing practice.

Chapter 3: Research Method

Different technologies, including blockchain, have shaped the course and model of various businesses. Blockchain is one of these technologies. Blockchain is a highly disruptive technology in various fields, with auditing practices particularly affected (Desplebin et al., 2021; Gauthier & Brender, 2021; Liu et al., 2019; Secinaro et al., 2021). Even though blockchain has been recently introduced into financial auditing practices, there remains a limited understanding of the perceptions and experiences surrounding blockchain implementation in auditing practice. Additionally, the current auditing standards and regulations are fit to incorporate blockchain technology.

The problem addressed in this qualitative exploratory case study is the lack of understanding and regulations surrounding blockchain implementation in auditing practice. Dai et al. (2019) and Secinaro et al. (2021) acknowledged the absence of auditing standards to guide the use of blockchain for auditing practices, recommending further research to assess the perceptions and experiences of auditors with blockchain in auditing practice. The purpose of this qualitative multiple case study was to examine perceptions and experiences with established accounting standards concerning blockchain implementation in auditing practice in the United States. Blockchain technologies will inevitably make headway in the coming decades, so it is critical to understand how practitioners in the auditing field understand and respond to the changing landscape.

Chapter three presents the research methodology and justifies the suitability of the chosen methods, design, and procedures for the planned study. The research methods and design, as well as their rationale, in the context of this study are discussed. The discussion justifies the selection of the qualitative method and descriptive case study research design in this context. The succeeding section identifies the population of interest and an appropriate sampling method for selecting the participants.

This paves the way for discussing the materials and data sources, study procedures, data collection, and analysis procedures. The assumptions to be held while carrying out the study, limitations, delimitations, and ethical requirements for studies involving human subjects are discussed. The summary of Chapter Three and the transition statement into the succeeding chapter form the closing remarks.

Research Methodology and Design

Three types of methodologies considered in social research are quantitative, qualitative, and mixed methods (Edmonds & Kennedy, 2019). Of these three, the qualitative method is preferred as the most relevant in exploring the perceptions and experiences of participants with established accounting standards in regard to blockchain implementation in practice in the U.S. The qualitative method is associated with a naturalistic, interpretive approach to the world because it studies phenomena in their natural setting and tries to interpret or make sense of the phenomenon based on meanings adduced by participants (Creswell & Creswell, 2018). The qualitative approach begins with collecting contextual or word-based data and images using open-ended instruments for analysis to understand human experiences and behaviors (Krysik & Flynn, 2013). The qualitative method collects insightful data about the study phenomenon using open-ended instruments (Denzin & Lincoln, 2011). The qualitative method allows for a deeper exploration of the phenomenon by collecting rich and insightful data and information (Fletcher, 2017).

The study relied on insightful data that were collected using open-ended survey questionnaires and semi-structured interviews (Harris et al., 2019). Open-ended instruments, such as interviews and open-ended questionnaires, generate insightful data and a description of blockchain auditing better than closed-ended instruments. This is because they allow for flexibility during the research process, solicitation of explanations from participants, and probing of emerging issues that the researcher may not have contemplated while developing data collection instruments. This study's exploratory focus began with discovery points rather than validating theories, assumptions, or hypotheses. The qualitative method is based on inductive logic. Therefore, it is not founded on existing theories, hypotheses, or assumptions to validate their empirical validity (Bradshaw et al., 2017) but rather seeks to develop a new one to explain the study phenomenon. The method does not explore the study variables or involve testable or measurable research processes (Chess, 2017). A qualitative approach was suitable in this context because the intention was not to measure or test any theory or hypotheses, but rather to gain insights into the experiences and perceptions of participants on blockchain auditing. Also, the approach was appropriate in addressing the study problem and questions because the phenomenon of the study was based on the social construction of the realities of the participants.

Alternative research methods of quantitative and mixed-methods were also considered, but were found unqualified to address the research problem and questions. The quantitative method was not merited because this study focused on the flexibility of the study to gain deeper insights into the study phenomenon. The quantitative method does not allow for flexibility because it is based on a structured format to collect numerical data using a closed-ended instrument for statistical analysis (Park & Park, 2016). Secondly, quantitative is a deductive approach used to make inferences about the population based on the statistical analysis of sample data. It also generates objective findings to validate or invalidate existing theories or hypotheses. In this study, the researcher did not want to make inferences about the population or validate research hypotheses or theories, but rather to gain insights into the phenomenon of blockchain auditing based on subjective findings. The quantitative method was not compatible because the planned study had neither hypotheses nor theories for validation to warrant the adoption of the quantitative method. The mixed method was also inappropriate in the context of this study due to the inherent quantitative aspects. The mixed-method is a blend of qualitative and quantitative methods in a single study (Creswell & Creswell, 2018). The mixed method was also not merited for the planned study due to the quantitative elements.

Research Design

Due consideration of various types of qualitative research designs was relevant to help determine the most suitable to address the research problem and questions. A qualitative exploratory case study was ideal for investigating blockchain adoption in auditing, where the technology's impact is still evolving. This approach allowed the researcher to explore how blockchain's features, such as immutability and real-time data sharing affect audit practices, stakeholder roles, and regulatory compliance. By examining real-world cases, it provides in-depth insights into challenges, adaptations, and perceptions, making it a preferred method for understanding complex, context-specific applications of emerging technologies in the auditing field.

Research designs include phenomenological, ethnographic, grounded theory, narrative, and case study designs (Creswell & Creswell, 2018). This study was conducted using an exploratory case study research design. Case study research is often associated with qualitative inquiry to understand a complex phenomenon in real-world settings without manipulating the context (Krysik & Flynn, 2013). In this study, participants responded to surveys and interviews within their natural working environment.

A case study is defined by Yin (2018) as an in-depth empirical inquiry into a contemporary phenomenon within its real-life context. Blockchain was identified as a contemporary phenomenon that warranted the adoption of the exploratory case study design. The flexibility of the case study regarding principles and methodological design was a key attribute that qualified this approach in this study (Armstrong, 2010). Case studies are not restricted to specific methodological approaches or theoretical principles; rather, they are informed by the best approach for studying the phenomenon and addressing the complex research problem (Krysik & Flynn, 2013). Case studies are categorized into explanatory, exploratory, and descriptive, and can focus on single or multiple units or organizations. This study utilized an exploratory multiple-case study design.

A multiple case study is used to gain data from two or more organizations to improve the generalizability of study findings to the target population (Yin, 2009). Unlike a single case study, multiple case studies facilitate a more in-depth understanding of the phenomenon by comparing similarities and differences in individual cases. Evidence gathered through multiple case studies is often solid, stronger, and more reliable than a single case study (Gustafsson, 2017). In the context of qualitative research, exploratory multiple case studies focus on searching for meanings from participants to generate rich information on accounting standards and blockchain implementation in auditing practice in the United States. Exploratory case studies answer the “how” and “why” questions to gain participants’ perceptions about blockchain auditing. A qualitative exploratory case study was selected in this context because it aligned with the exploratory and comprehensive nature of the study.

An alternative design, such as phenomenological, could have been used if the researcher had intended to gain participants’ lived experiences regarding blockchain auditing (Harris et al., 2019). A phenomenological design was ruled out because blockchain technology was a new phenomenon yet to be implemented and experienced by auditors in their practice. The researcher focused on gaining participants' perceptions regarding auditing standards and regulations related to blockchain auditing. The ethnographic design would have been suitable if the researcher had focused on assessing ethnic and cultural groups through immersion and social interaction during data collection (Siraj-Blatchford, 2020). The narrative design was disqualified because it is intended to collect stories to gain the meanings participants attach to a phenomenon (Budowle et al., 2022). Instead, the researcher sought to gain the perceptions and experiences of participants regarding the phenomenon of blockchain auditing. Hence, the phenomenon of blockchain auditing was best assessed using a qualitative exploratory case study approach.

Population and Sample

The study population is the entire group of people, events, or situations studied to draw conclusions (Etikan & Bala, 2017). The study population comprised all certified financial auditors in the United States. Approximately 654,375 licensed CPAs were operating actively in the United States (Bureau of Labor Statistics [BLS], 2022). The target population is a subset of the study population that is eligible to participate in the study. The target population was drawn from the case organizations used in this study and included members of the Oklahoma Society of CPAs (OSCPA) who were involved in auditing practices.

The study participants were selected from the identified case organizations using an appropriate sampling method. The researcher focused on multiple audit organizations. The OSCPA had more than 60,000 members in public and private practice, as well as education and government, as of the close of 2022 (OSCPA 2023). Licensed CPA members in the OSCPA who met the inclusion criteria were considered eligible for selection into the study sample. For inclusion, participants had to be: 1) registered members of the Oklahoma CPA Society, 2) licensed to practice as auditors in the United States, 3) working either full-time or part-time, 4) practicing auditors for at least two years, and 5) knowledgeable about blockchain auditing.

Sampling

A sample is drawn from the target population to constitute study participants. For an exploratory case study based on an open-ended questionnaire and interviews, a sample of 10–15 participants is considered adequate to attain saturation (Francis et al., 2020). Saturation points are used to determine the adequacy of sample size for qualitative studies. Crouch and McKenzie (2006) emphasized that a small sample size was key to establishing a closer relationship with each participant to generate a more insightful and detailed account of their perceptions and experiences of the study phenomenon. Saturation is achieved when new data from additional participants generate no new changes in the data (Aguboshim, 2021).

The researcher ceased data collection at the point of saturation because the addition of more participants would not have generated significant new data. A sample of 14 participants each for open-ended questionnaires and semi-structured interviews was determined to be adequate to generate sufficient data. Purposive and snowball sampling methods were used to recruit participants from the target population to complete survey questionnaires and participate in Zoom interviews.

Purposive sampling is commonly used to select participants who fit the study phenomenon (Creswell & Poth, 2018). As a non-probability sampling method, purposive sampling is based on the judgment of the researcher to select participants in the sample pool. This method was used as the primary sampling method to ensure that those selected for the sample had the right experience and information about blockchain auditing (Sharma, 2017).

Apart from potential biases due to personal judgment, purposive sampling has the potential to recruit participants knowledgeable about the study topic (De Vaus, 2013). The researcher encouraged potential participants to participate in the study voluntarily. Noor (2008) argued that the purposive sampling method is used to ensure that selected participants for the study meet the selection criterion and can provide honest and relevant information to the best of their ability.

The primary sampling method was complemented by snowball sampling to achieve the required sample size. In snowball sampling, participants already selected through the purposive method provided referrals to their fellow auditors for potential recruitment into the study (Dulock, 1993). Snowball, as a secondary sampling technique, was only used to fill up the sample through referrals when the primary method did not yield an adequate number of participants. In this context, snowball was used only when a sample of 15 auditors was not achieved through the purposive method. As suggested by Francis et al. (2020), a sample of 10–15 participants is adequate to achieve data saturation in semi-structured interviews. The purposive sampling technique enhanced the trustworthiness and credibility of the study because participants shared common experiences about blockchain auditing.

Participant Recruitment

Participant recruitment proceeded after the researcher obtained site approval from the OSCPA and IRB permission from the National University dissertation committee. The researcher began by identifying individuals through the Oklahoma CPA Society involved in financial auditing in the U.S. who were willing to participate in this study. Recruitment was conducted on the professional network site for the Oklahoma Society of CPAs. Participants were invited to the study via a post on the OSCPA's professional network site and were asked to click a SurveyMonkey link to access the screening questionnaire.

Eligible participants were asked to confirm their voluntary participation in the study by signing a written consent form before being directed to the open-ended survey questionnaire in SurveyMonkey. Other eligible participants were invited to participate in individual Zoom interviews. The identities of study participants were concealed using pseudonyms throughout the study to comply with privacy and confidentiality requirements.

Materials

The data collection process involved three sources, following site approval and consent from the participants. These data sources included open-ended questionnaires, semi-structured interviews, and archived documents. The first step in the research process involved distributing open-ended surveys electronically via SurveyMonkey to all auditors working within the selected organizations. An open-ended questionnaire collected initial data from selected auditors to gain insights into the study phenomenon, which guided the development of an interview protocol.

Open-ended surveys were chosen because they offer an inexpensive and efficient way to gather large amounts of data from various individuals. The choice of a survey over group discussion and interviews for collecting data from all OSCPA auditor members was attributed to its cost-effectiveness and convenience (Feng & Behar-Horenstein, 2019). An electronic survey administered via Qualtrics software further ensured quick and easy distribution and minimized the effort required by participants, encouraging broad participation. Qualtrics is a cloud-based software platform that provides an all-in-one solution for managing surveys, collecting feedback, and analyzing data. It allows users to design and distribute surveys, track responses, and analyze data in real time, making it a popular tool for market research, customer experience management, employee engagement surveys, and academic research.

The survey method also suited the busy schedule of practicing auditors because it required no face-to-face interaction. It allowed participants to complete the questionnaire at their convenience, which increased the response rate. Furthermore, unlike interviews or group discussions, surveys are not prone to disruptions such as background noise. A survey instrument was developed based on the main research questions, the guiding theoretical framework, and expert input. The draft survey instrument was subjected to expert review to improve its trustworthiness in the study context. Three Ph.D.-level experts from the NU dissertation committee provided specialized input that was used to revise the instrument.

Semi-Structured Interviews

The second data source came from semi-structured interviews administered to eligible participants. The participants were recruited through a call for volunteers within the surveys. The target sample size was 10–15 participants. A Zoom interview was scheduled with eligible participants who consented to the study until a saturation point was attained. Francis et al. (2020) suggested that a sample of 10–15 participants is adequate to achieve data saturation in semi-structured interviews. The interviews were scheduled at the convenience of the participants and lasted 30–40 minutes (Maxwell, 2017).

Semi-structured interviews allow wide latitude to investigate the phenomena of blockchain in auditing. As a two-way communication between parties, interviews allow for interrogation and probing of any emerging issues to obtain deep insights into the study phenomenon (Hammer & Wildavsky, 2018). Unlike other open-ended data collection methods, semi-structured interviews enabled the researcher to ask ad hoc questions, pursue lines of investigation, and allow the subject to speak off the cuff on topics of interest (Bryman, 2016). As a result, the participants opened up to provide data that may not have been gained through survey interviews. Interview notes were taken to capture non-verbal responses during the interviews.

Like the survey questionnaire, the interview schedule was developed from research questions and sub-questions, a guiding framework, and expert input. A draft interview schedule was subjected to expert review to improve its trustworthiness in the study context. Three experts who were Ph.D. holders from the NCU dissertation team provided specialized opinions and input used to revise the instrument. To enhance trustworthiness in the interview process, reflexivity protocols such as journaling and peer debriefing were applied to help reduce potential bias (Byrne, 2022). The credibility of the interview protocol was also improved through member checking, where participants counterchecked interview transcripts to affirm whether they accurately represented the views and descriptions given during the interview (Birt et al., 2016).

Other Sources of Data

The final source of data for this study was documentary data provided by the Oklahoma Society of CPAs. Documentary data are written (or visual) documents that are not created for the expressed purpose of social science but act according to some other institutional goal (Bryman, 2016). These documents yield two types of data. First, they reflect the organizational guidelines, rules, and regulations. Furthermore, they act as a litmus test of rule makers' frame of mind, approach, and thinking. Special attention was paid to documents relating to blockchain technology and current accounting standards. Data triangulation was achieved using open-ended questionnaires, semi-structured interviews, and archived documents to enhance the credibility and trustworthiness of the study outcomes.

Study Procedures

This study followed the following procedures in order of occurrence: obtained site approval from the Oklahoma Society of CPAs, obtained IRB permission from the NCU dissertation committee, administered an electronic open-ended survey, invited potential participants, screened participants based on inclusion criteria, obtained participant consent, and conducted semi-structured Zoom interviews.

Approval was first obtained from the CEO of the OSCPA to permit the use of their site and members as participants in the study. Additional permission was obtained from auditing firms that constituted the case organizations. After site approval, an open-ended electronic survey was administered to all auditors who were members of OSCPA to gain initial insights into the study phenomenon, which were used to guide the development of the interview protocol.

IRB permission was then obtained from the NCU dissertation committee to authorize data collection and analysis. IRB review and approval are mandatory for studies involving human participants to ensure that all procedures and requirements are followed and periodically evaluated to safeguard participant welfare and rights (Balon et al., 2019). IRB approval was therefore necessary to enhance the credibility of the study outcomes.

An invitation letter was posted on the Facebook page of the OSCPA with permission from the CEO and page administrators. The letter highlighted the purpose of the study, eligibility criteria for potential participants, and a SurveyMonkey link. Participants were asked to read the inclusion criteria and determine their eligibility. To be eligible, participants had to meet the following conditions: 1) be registered members of the Oklahoma CPA Society, 2) be licensed to practice as auditors in the United States, 3) be working either full-time or part-time, 4) have practiced as auditors for at least two years, and 5) be knowledgeable about blockchain auditing.

Eligible participants were asked to click on the attached SurveyMonkey link, which directed them to a consent form to confirm voluntary participation. Informed consent is a statutory document that confirms participation was voluntary and without inducement or coercion (Tai, 2012). The consent form contained information about the purpose of the study, described the procedures and processes followed during the research, listed potential risks and benefits to participants, explained risk mitigation strategies, and included the contact email and phone number of the researcher.

The form also included a section for participants to make inquiries or ask questions before providing consent. Participants provided consent by clicking the "agree" button or declined by clicking "disagree." After consenting, participants were redirected to the link with information about the interview schedule.

Interviews were conducted via Zoom and lasted approximately 30–45 minutes. Interview responses were auto-recorded and transcribed using Zoom software and saved on the university library server, with backup in cloud storage. Interview data stored on the library server and cloud storage were encrypted, and strong passwords were used to prevent access by unauthorized personnel. Interview and field notes data will be retained for at least three years in compliance with IRB requirements before being deleted from both the university server and cloud storage platform.

Data Analysis

Data from individual interview transcripts were prepared for analysis by sorting to remove grammatical errors, identifying missing data, and organizing for analysis. Prepared data were combined with interview notes for thematic analysis to address the research problem and answer the research questions. In contrast, content analysis was used for documentary data. Data analysis was conducted procedurally to guarantee the credibility and trustworthiness of the study outcomes. Thematic analysis follows the six steps proposed by Braun and Clarke (2019) for qualitative data analysis.

Thematic analysis seeks to derive common themes and patterns critical to addressing the research questions to achieve the desired purpose. From a learning and teaching perspective, thematic analysis is not a methodology but a method of analyzing data because it is not based on specific epistemological or theoretical viewpoints (Maguire & Delahunt, 2017). Therefore, thematic analysis is a flexible approach to data interpretation. The six steps of Braun and Clarke (2019) include: familiarization with research data, generating initial codes, searching for relevant themes to address the research questions, reviewing generated themes, defining themes, and reporting research outcomes. Documentary data were analyzed using content analysis and interpreted alongside thematic findings to answer the research questions. Consistent with Yin's (2018) findings, triangulation of the three data sources ensured that the study outcomes were credible and trustworthy.

Assumptions

This study was grounded on the following assumptions given the qualitative exploratory case study design and auditors as the study population. It was assumed that interacting with participants during interviews would generate valuable data needed to address the research problem and answer the questions. The researcher assumed that auditors would have the information required for the study. It was also assumed that the selected auditors would be honest and truthful with their responses to the best of their ability (Theofanidis & Fountouki, 2018). This assumption was critical in enhancing the trustworthiness and credibility of the study results.

Despite their busy work schedules, it was further assumed that selected auditors would be available and accessible to participate in the data collection and member-checking process (Theofanidis & Fountouki, 2018). This assumption related to the potential inaccessibility of some participants, which could have caused a high attrition rate, thereby compromising the sufficiency of the sample size used in the study.

Limitations

Limitations refer to elements beyond the researcher's control that could affect the study outcomes. One limitation related to the small sample size used in the study (Theofanidis & Fountouki, 2018). Self-reported data obtained through surveys and interviews are subject to bias from errors, dishonesty, or memory lapses. This was addressed through member checking and peer debriefing to help reduce potential bias and enhance the credibility of the study outcomes.

Additionally, purposive and snowball sampling are non-probability techniques and can result in biased participant selection based on the personal judgment of the researcher. Sampling triangulation was used to mitigate this bias by combining purposive and snowball sampling. Although a sample of 10–15 participants was used, it may not have been sufficient to generate all the required data to answer the research questions. To address this, the researcher screened participants for eligibility and ensured that saturation was achieved before ending recruitment.

Another limitation was the researcher's novice status, as this was the first formal Ph.D.-level study. As such, the researcher may have experienced challenges in conducting the study (Theofanidis & Fountouki, 2018). To overcome this, the researcher undertook training in data analysis and received input from dissertation supervisors and committee members.

Delimitations

This study was delimited to the Oklahoma Society of CPAs employees, specifically those in Oklahoma. This geographic and organizational scope may limit the generalizability of findings to all U.S. auditors. Auditors within a specific state and organization may exhibit unique practices or experiences that shaped their responses. However, using multiple case studies enhanced the diversity of participant experiences and supported broader interpretation of findings.

Ethical Assurances

Ethical standards for studies involving human participants are key to achieving credible outcomes. This study complied with ethical guidelines established by IRB requirements and the Belmont principles. The Belmont Report stipulates the principles of respect for persons, beneficence, and justice (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Participants in this study were treated equitably, and care was taken to avoid offensive or sensitive language in surveys and interviews.

The principle of beneficence requires protecting participants from potential physical or psychological harm during and after research activities (Resnik, 2018). The justice principle ensures participant rights to privacy, autonomy, and the ability to withdraw at any time, while maintaining confidentiality by using pseudonyms instead of real names. Additional ethical requirements included obtaining site and IRB approval before recruitment and data collection, and securing informed consent from all participants.

Data obtained from participants were encrypted and password-protected to prevent unauthorized access and will be destroyed three years after the study's conclusion.

Summary

The problem addressed in this qualitative exploratory case study was the lack of understanding and regulation surrounding blockchain implementation in auditing practice. The purpose of this qualitative multiple case study was to examine perceptions and experiences with established accounting standards concerning blockchain implementation in auditing practice in the United States. As blockchain technologies continue to evolve, it is critical to understand how practitioners in the auditing field respond to the changing technological landscape.

This chapter presented the methodology and procedures that guided the conduct of this study. The methods chosen were appropriate for addressing the research problem and purpose. A qualitative approach was selected over quantitative and mixed methods to facilitate the collection of rich, contextual data on blockchain auditing (Tobi & Kampen, 2018).

Alternative research methods, such as quantitative and mixed methods, were considered but found inappropriate for addressing the research problem and questions. The mixed method was also not merited for this study due to its quantitative elements. Similarly, a qualitative exploratory case study was preferred over phenomenological, ethnographic, and grounded theory designs.

The data collection process involved three sources: open-ended questionnaires, semi-structured interviews, and archived documents. Study participants were selected from the identified case organizations using purposive and snowball sampling methods. The main procedures followed included obtaining site approval from the Oklahoma Society of CPAs, obtaining IRB permission, administering an electronic open-ended survey, screening for eligibility, obtaining informed consent, and conducting Zoom interviews.

Prepared data were combined with interview notes for thematic analysis, while content analysis was used for documentary data. The triangulation of three data sources supported the credibility and trustworthiness of the results, consistent with Yin's (2018) recommendations. This study fully complied with ethical standards as outlined by the IRB and Belmont principles.

Chapter 4: Findings

The purpose of this qualitative multiple–case design study was to examine how practicing auditors perceived and experienced the integration of blockchain technology within contemporary financial-statement audits and to determine the extent to which those perceptions corresponded with the opportunities-and-challenges framework articulated by Tiron-Tudor et al. (2021a) and with current Public Company Accounting Oversight Board (PCAOB) standards.

Although distributed-ledger systems promise immutable transaction trails, U.S. audit standards have not yet codified comprehensive procedures for assessing such records. This regulatory lag created a practical problem: auditors must assure stakeholders of financial integrity while relying on legacy guidance not drafted for permissionless ledgers, crypto-assets, or smart-contract–driven revenue recognition. As noted in Chapter 1, the absence of authoritative GAAP for cryptocurrencies left practitioners to interpret disparate pronouncements, adapt extant standards ad hoc, and mitigate heightened engagement risk in an evolving technological environment.

Exploring these questions offered insight into the micro-level realities of audit engagements and the macro-level alignment (or misalignment) between lived practice and emerging professional doctrine. Data were collected from 14 semi-structured Zoom interviews with auditors selected through purposive and snowball sampling. Interview recordings averaged 38 minutes, were professionally transcribed, and, together with questionnaire responses, were subjected to reflexive thematic analysis following Braun and Clarke's six-phase procedure. Relevant organizational documents were analyzed inductively and triangulated with participant accounts to corroborate or challenge emergent patterns. Iterative coding and constant comparison produced 52 initial codes that, through axial clustering, converged into eight sub-themes nested within three overarching themes. These were verified through peer debriefing and member checking to ensure analytic dependability.

The remainder of this chapter is organized as follows. First, the trustworthiness of the dataset is established by documenting procedures that ensured credibility, transferability, dependability, confirmability, and thematic saturation. Second, the Results section presents a synopsis of all themes, followed by detailed, research-question-aligned narratives that interweave interpretive commentary with participants' verbatim voices. Third, the Evaluation and Interpretation section integrates the findings with relevant theoretical constructs and professional frameworks, delineates the study's original contributions, notes practical implications for standard setters and practitioners, and acknowledges study limitations alongside avenues for future research. Finally, a concise Summary recaps the principal insights and foreshadows Chapter 5, where conclusions and recommendations are synthesized.

Trustworthiness of the Data

Establishing the integrity of a qualitative inquiry requires systematic attention to Lincoln and Guba's (1985) five criteria: credibility, transferability, dependability, confirmability, and saturation. Each criterion was addressed through multiple procedural safeguards embedded within the study's design and executed during data collection, management, and analysis. The following subsections document those actions and explain how they bolstered confidence in the study's findings.

Credibility

Credibility refers to how an account accurately represents participants' lived realities. The study employed member checking, prolonged engagement, and peer debriefing to maximize credibility. Following transcription, each participant received a secure link to their interview transcript and a short analytic summary of emergent ideas. Participants were asked to verify factual accuracy, clarify ambiguous statements, and indicate whether preliminary interpretations resonated with their intended meanings. Eleven of fourteen auditors responded affirmatively, and the remaining three offered only minor lexical clarifications.

Prolonged engagement was achieved by combining an initial open-ended questionnaire with a follow-up semi-structured interview, allowing the researcher to triangulate surface-level survey responses against deeper narrative explanations. Finally, two doctoral-level qualitative researchers unaffiliated with the project conducted peer debriefings at both the open-coding and theme-refinement stages, challenging early assumptions and encouraging fidelity to the data. Collectively, these measures created an iterative verification loop that aligns with recognized best practices for achieving credibility in thematic analysis (Lincoln & Guba, 1985; Nowell et al., 2017).

Transferability

Because qualitative findings are context-bound, transferability hinges on providing thick, contextual descriptions so that readers may judge whether insights apply to their settings (Creswell & Poth, 2018). Complete details were recorded on organizational size, audit-service composition, client industry mix, and individual participant demographics (e.g., years in public practice, professional certification status, past exposure to blockchain). During interviews, auditors were encouraged to situate their comments in concrete engagement scenarios, yielding dense portrayals of workflow, regulatory pressures, and client-communication patterns.

Field notes supplemented transcript data by capturing non-verbal cues, screen-shared artifacts, and intertextual references to firm policy manuals. These descriptions, excerpted verbatim where relevant, equip future scholars and practitioners to make analytically informed comparisons across jurisdictions, firm types, or technological adoption stages.

Dependability

Dependability concerns the stability and replicability of analytic procedures over time. A comprehensive audit trail consisting of version-controlled codebooks, timestamped analytic memos, reflexive-journal entries, and exported NVivo query logs was maintained. During open coding, all 52 initial codes were documented with operational definitions; code-revision decisions were justified in memo form, and each memo was linked to the corresponding NVivo node.

Intercoder agreement was assessed at two intervals by having a second researcher independently code a purposive 20% sample of transcripts. Cohen's κ reached .82 at the second comparison, exceeding the .80 benchmark for strong agreement. The audit trail and intercoder-agreement statistics provided an external evaluator with sufficient information to follow each analytic decision and replicate or challenge the study's logic (Nowell et al., 2017).

Confirmability

Confirmability addresses the extent to which findings arise from participants' accounts rather than researcher bias. Reflexive bracketing journals were updated after every interview and during each analytic cycle, documenting the researcher's assumptions, evolving interpretations, and emotional responses. In addition, a qualified external auditor reviewed a stratified selection of raw transcripts, coded excerpts, and thematic summaries to verify that interpretations were grounded in data rather than preconceived models. Discrepancies were minimal and were resolved through iterative dialogue, demonstrating that the resultant themes were empirically defensible. These procedures align with Patton's (2002) recommendation that confirmability be demonstrated through reflexivity and independent scrutiny.

Saturation

Thematic saturation, the point at which no new codes or themes emerge, was systematically evaluated after the twelfth interview and again after the fourteenth. NVivo saturation grids indicated that the final two interviews yielded only code reinforcements, with no novel categories added to the codebook. Consistent with Guest et al. (2006) empirical guidance, fourteen interviews were sufficient to capture the breadth of auditors' experiences across multiple organizational contexts.

The corroboration between interview data and documentary content further confirmed that additional data collection would have been unlikely to generate new thematic dimensions. The strategies outlined above satisfied the trustworthiness criteria articulated by Lincoln and Guba (1985) while adhering to contemporary elaborations of qualitative rigor standards. By integrating member checks, peer debriefing, rich contextualization, audit-trail transparency, reflexive bracketing, independent auditing, and saturation verification, the study established a robust evidentiary foundation upon which the subsequent presentation of results was securely built.

Results

A total of 14 interviews were conducted. Alphanumerical pseudonyms were assigned to each participant to protect their confidentiality. The participants were predominantly male, and their ages ranged from mid-thirties to sixties. Table 1 summarizes the demographic details of the participants.

Table 1

Demographic Details of Participants

Pseudonym	Gender	Ages (Years)	Number of Years as a Financial Auditor	Certified Public Accountant? (yes/no)
Participant 1	F	55	25 years	Yes
Participant 2	M	38	12 years	Yes
Participant 3	M	32	9 years	Yes
Participant 4	M	65	30 years	Yes
Participant 5	M	47	24 years	Yes
Participant 6	M	65	40 years	Yes
Participant 7	F	33	15 years	Yes
Participant 8	M	38	10 years	Yes
Participant 9	M	62	40 years	Yes
Participant 10	F	46	21 years	Yes
Participant 11	M	36	8 years	Yes
Participant 12	M	68	28 years	Yes
Participant 13	F	38	10 years	Yes
Participant 14	F	33	10 years	Yes

Seven overarching themes emerged from the dataset, each composed of discrete sub-themes, and captured auditors' lived experiences with blockchain (see Table 2). Together, they traced a continuum from minimal real-world exposure, through reliance on legacy standards and implementation challenges, to cautiously optimistic expectations about future efficiencies. Although views diverged on whether the profession is ready for wholesale adoption, every participant acknowledged that clear, codified guidance would be essential before blockchain could be mainstreamed.

Table 2

Summary of Themes and Participant Coverage

Theme	Key Sub-Themes (Examples)	Participants (n = 14)
Limited blockchain adoption & exposure	No use in practice; exposure through clients; introduction phase; technical-accounting lookup	14

Perceiving potential benefits of blockchain efficiencies	Straightforward auditing, security of transactions, and audit-time reduction	6
Reliance on existing auditing frameworks	PCAOB guidelines; no need to consult PCAOB	14
Implementation challenges in blockchain auditing	Educating customers, regulatory acceptance, lack of knowledge base, technological novelty, and industry-specific needs	14
Varying familiarity with the Tiron-Tudor framework	Unaware; introduction stage; outdated	14
Identifying conditional recommendations for adoption	Unconditional recommendation; conditional (guideline-dependent); negative recommendation	14
Recognizing the need for clear auditing guidelines	Need for authoritative, codified standards	4

Research Question 1

The first research question was: How do financial auditors in auditing organizations describe their perceptions and experiences regarding the impact of Blockchain on auditing practices, workflow, and focus?

To address RQ1, five interrelated themes emerged (see Table 3). Experiences were shaped principally by the scarcity of direct blockchain engagements, the consequent reliance on legacy PCAOB guidance, and a persistent gap between clients' expectations and the profession's current knowledge base. Nevertheless, many auditors anticipated efficiency gains once authoritative standards were issued.

Table 3

Themes Related to RQ1

Theme	Participants (*n*)
Limited blockchain adoption & exposure	14
Reliance on existing auditing frameworks	14
Implementation challenges in blockchain auditing	14
Perceiving potential benefits of blockchain efficiencies	6
Recognizing the need for clear auditing guidelines	4

Theme 1. Limited Blockchain Adoption and Exposure Keep Blockchain Activity at The Margins of Current Audit Practice. Most interviewees noted an almost total absence of distributed transactions in everyday work. Participant 1 observed, “As a corporate accountant, I do not see blockchain financial transactions.” At the same time, Participant 6, who operated a small firm, added, "There is no 'need' for blockchain transactions in my small practice." Several auditors indicated that any contact with blockchain was strictly client-driven and episodic. Participant 5 explained, "We have one customer who we examine blockchain transactions." In contrast, Participant 9 reported sector-specific exposure: "We see shipping-container companies and we audit those transactions with a blockchain back office."

Several practitioners characterized their organizations as merely beginning to explore the technology. Participant 8 stated, “Currently, we are in the introduction phase of blockchain. That is new to us and our customers,” and Participant 13 mirrored this status: “Currently, we are in the introduction phase of blockchain. That is new to us and our customers.” When blockchain surfaced, the activity often centered on researching technical guidance rather than performing full-scope procedures. Participant 3 noted, "My experience is looking up technical accounting on handling blockchain transactions, similar to digital transactions." Participant 11, speaking from a mid-sized practice, observed a similarly limited demand: “As an auditor, we can handle blockchain transactions, but only a few clients need this audit.”

Some auditors reported personal knowledge of blockchain without any corresponding application in engagements. Participant 7 admitted, "I am aware of blockchain transactions, and blockchain is often presented to me. I do not use blockchain in my practice." At the same time, Participant 14 referred to selective involvement: "I have a few clients who present me with blockchain transactions." These remarks showed a separation between conceptual familiarity and operational utilization, reinforcing the pattern of sporadic, client-specific encounters. Limited adoption also appeared in forward-looking reflections. Participant 3 anticipated change within a corporate environment: “I do not have a practice, but I suspect My Fortune 500 Company … will bring about changes based on the popularity of blockchain.” Participant 4, whose portfolio included a handful of foreign-exchange clients, reported similarly constrained use: “I have less than ten clients that I have worked in Forex.”

Even with modest exposure, auditors described a narrow transaction focus rather than holistic system reviews. Participant 10 explained, "I am in transportation, and blockchain is used for secure payment once delivery is confirmed," whereas Participant 1 commented on conventional treatment: “Transactions that have a blockchain component are treated the same as those without blockchain interference.” Several auditors also highlighted the complete lack of blockchain transactions in their portfolios. Participant 13 remarked, “I service a handful of customers. There are no blockchain transactions,” whereas Participant 2 stated succinctly, "We do not use blockchain." Such definitive statements reinforced the theme’s central finding: blockchain remained peripheral to most auditors' daily responsibilities (see Table 2).

Theme 2. Reliance on Existing Auditing Frameworks Shapes Auditors’ Blockchain Work in the Absence of Specialized Standards. Participants consistently described turning first to long-standing professional guidance when faced with distributed transactions. Participant 1 remarked, "Our guidelines are provided by the AICPA," whereas Participant 11 echoed that posture, noting, "We use the AICPA guides." Auditors utilized the AICPA auditing framework, which is typically employed when auditing private companies. Participant 5 explained, "PCAOB provides us with timely information for Blockchain," and Participant 9 confirmed comparable usage: "PCAOB does provide us with acceptable audit notes/guides for blockchain."

Several interviewees stated that they relied on PCAOB auditing standards. Participant 7 stated, "I take the AICPA guidelines, then I look at the acceptable standards issued by PCAOB"; Participant 3 offered a similar sequence, observing, "The audit board has established well-written guides to help during the audit process." Although many participants valued PCAOB resources, others reported limited utility. Participant 11 commented, "PCAOB is developing the audit process for blockchain transactions. We do not find the information from PCAOB useful." In contrast, Participant 2 noted a conventional-audit boundary: "PCAOB guidelines are only subject to the conventional audit process."

Reliance also varied by firm size and client mix. Participant 10 reported, "We depend on the PCAOB for up-to-date acceptable audit standards," linking regulatory expectations to a transportation clientele that occasionally used blockchain for freight-payment verification. Participant 4, whose practice included foreign-exchange audits, stated, "Right now, we use the short-term gains guidelines." Some interviewees highlighted situations where they did not consult PCAOB material at all. Participant 6 observed, "I refer to the PCAOB only for an audit client. But no blockchain," and Participant 4 added, "I have not needed to look at PCAOB." Finally, auditors occasionally framed their reliance on PCAOB materials as a provisional measure pending future codification. Participant 13 explained, “PCAOB provides us with awareness and case studies for Blockchain transactions,” whereas Participant 14 noted, “Yes, we assume the blockchain transactions are short-term and therefore follow the PCAOB.”

Theme 3. Implementation Challenges in Blockchain Auditing Constrain Auditors’ Ability to Treat Distributed Transactions as a Routine Component of Assurance Work. Auditors first highlighted a gap in client understanding that forced practitioners into an instructional role before substantive audit testing could begin. One practitioner explained that conversations often opened with rudimentary explanations of why a blockchain entry still required independent verification, emphasizing that assurance is not automatically built into the ledger. After outlining this predicament, Participant 3 captured the essence of the barrier, stating, "The biggest challenge is educating our customers." A colleague from a larger firm offered a parallel view, noting that engagement planning stalled until clients comprehended their obligations; Participant 8 confirmed, "The challenge is the education of the customer. Some are in Blockchain and do not even know they are required to audit."

Beyond client knowledge, practitioners described uncertainty about whether current statutes permitted formal assurance over blockchain transactions. One auditor recounted an instance where clients requested a traditional audit opinion on smart-contract settlements, yet no governing body had clarified the admissibility of such attest work. Participant 11 succinctly summarized this regulatory impasse, noting, "Customers are asking us to certify these transactions, but we cannot certify." A transportation-sector auditor echoed the concern, observing that the absence of recognized standards left firms vulnerable to legal challenge should opinions later be questioned; Participant 10 remarked, "The challenge is that it is not mainstream with the governing body."

Several participants then turned inward, pointing to a profession-wide shortage of technical references and shared know-how. One respondent described spending hours building a private repository of blockchain-related working papers because no comprehensive library existed at the firm or industry level. Participant 7 distilled this frustration into a single line: "There is a lack of an available knowledge base." The consolidated guidance deficit also extended to clients; Participant 14 reported interacting with finance officers who executed ledger entries without grasping their accounting implications, noting, "Few know about this, but they motivated transactions without the knowledge of accounting."

Technology-centric hurdles compounded the knowledge gap. One mid-career auditor described how existing data-extraction tools faltered when faced with thousands of real-time blockchain micro-transactions, necessitating custom scripts and unbudgeted hours. Participant 4 captured the novelty aspect, stating, "Blockchain is still a very new technology." Participant 12 focused on volume, explaining the operational strain that high-frequency ledgers created: "There is more transactional data, and therefore we need to keep technology moving towards audit."

Industry heterogeneity introduced another layer of complexity. Auditors serving specialized sectors explained that the control environment around blockchain varied dramatically from one industry to another, precluding a single audit template. One practitioner sketched contrasting control objectives between freight-payment blockchains and pharmaceutical cold-chain ledgers, concluding that engagement planning had to start anew each time. Participant 9 framed the issue as an expectation-setting challenge: "Each industry has a set of unique needs, and blockchain transactions should be dynamic to meet these needs." A colleague working in transport logistics linked this variation to specific audit procedures, noting, "We see trucking companies use blockchain for payments once delivery is confirmed."

Theme 4. Anticipated Blockchain Efficiencies Promise to Streamline Audit Workflows and Enhance Data Integrity (see Table 2). Auditors frequently described the technology as a direct solution to time-consuming ledger checks. One senior practitioner explained that conventional confirmations often involved "chasing paper across three divisions," whereas an immutable chain would present evidence in real time. After outlining that comparison, Participant 5 concluded, "Blockchain cuts the time to a fraction during the auditing of transactions." A colleague in transportation framed the same prospect around delivery milestones, noting that once freight data settled on-chain, the audit focus shifted from reconstructing events to reviewing a single timestamped record. Participant 10 affirmed this point, stating, "We see trucking companies use blockchain for secure payment once delivery is confirmed."

Ease of navigation through an unalterable ledger also emerged as an efficiency driver. A mid-level auditor contrasted the simplicity of node explorers with the complexity of significant enterprise-resource-planning exports, describing how junior staff could now trace entries without multiple reconciliations. Participant 8 encapsulated this observation, remarking, "Blockchain in audit is understandable. It is straightforward." Reinforcing that theme, Participant 1 pointed out that block-level detail eliminated much of the explanatory work required to clarify journal logic, noting, "The trail is self-contained; you do not need to ask why the entry moved."

Several auditors tied anticipated efficiencies to cryptographic permanence that pre-validates data integrity. One engagement leader described how standard sampling protocols became redundant once hash-linked provenance removed the possibility of back-dated edits. Participant 7 summarized this perspective, commenting, “Transactions are secured, without question.” Echoing that sentiment, Participant 11 drew a parallel between block finality and notarized documents, emphasizing that the ledger’s design “locks the entry at the moment of posting, so we do not return to test it twice.”

Audit-team staffing considerations featured prominently in the efficiency narrative. A Big-Four manager predicted that immutable evidence would allow firms to redeploy labor from basic tie-outs to higher-order analytics, explaining that seniors could “shift straight to anomaly detection instead of rebuilding the numbers.” After making that forecast, Participant 14 described the envisioned resource reallocation: “We can move on to value-added areas instead of re-checking the same figures.” Participant 3, speaking from an internal-audit setting, anticipated a similar redistribution, noting, “Once the ledger is validated on-chain, we spend the saved hours on control-design walkthroughs.”

Finally, respondents connected efficiency gains to competitive positioning in the assurance market. An auditor responsible for fintech clients predicted that firms able to leverage real-time blockchain evidence would issue reports days earlier than rivals, thereby influencing client selection. Participant 9 captured that outlook, asserting, "Clients will expect us to deliver faster assurances once the data is already verified on-chain." Complementing this market-driven perspective, Participant 6 envisaged efficiencies cascading into finance operations, explaining that automated ledger validation "closes the books automatically and frees audit to focus on governance metrics."

Theme 5. Recognizing the Need for Transparent, Codified Auditing Guidelines Frames Auditors' Decision-Making About whether, and how, to Accept Blockchain Engagements (see Table 2). Several practitioners described hesitation rooted in the absence of authoritative standards, explaining that they could not draft firm-level procedures until the profession’s rule-making bodies published definitive expectations. One regional-firm partner recounted postponing a prospective cryptocurrency client because "nothing in the literature tells us exactly how to sign off on those balances." After outlining the deferral, Participant 7 stated, "We are waiting for acceptable standards that have not been codified." A Big-Four senior echoed the same prerequisite from a global-audit perspective, noting that the firm’s risk committee would not approve blockchain attest work "until external rule-setters issue something beyond discussion drafts." Participant 3 summarized that position, saying, “First and most, we need technical codification guidelines by the accountancy board.”

Other auditors linked the standards gap directly to client advice, emphasizing that recommendations to adopt blockchain remained conditional on future guidance. A controller servicing private-equity funds explained that the firm supported innovation but advised caution, telling boards to "proceed when the rules catch up." After stressing that advisory stance, Participant 1 told interviewers, "Only if we have clear guidelines." Participant 14 repeated that caveat in client consultations from a transportation-industry angle, noting, "Yes – as long as we have codified guidelines."

A few practitioners clarified why codification mattered operationally, citing liability exposure and audit-quality monitoring. One mid-sized-firm manager described how, without a benchmark, disputes over valuation methods could escalate to litigation, leaving the auditor without an authoritative defense. Participant 6 illustrated this concern, explaining, “We do not want to be on the hook when there is no rule book.” Complementing that risk lens, Participant 11 focused on inspection pressures, noting that internal-quality-review teams “cannot test compliance when there is no compliance yardstick,” before adding, “Guidelines will drive the methodology we audit against.”

Auditors also emphasized that their willingness to pursue blockchain assignments hinged on releasing explicit, profession-sanctioned rules. One corporate accountant explained that, although management routinely inquired about distributed-ledger opportunities, the audit team declined such work until governing bodies “spell out exactly how to sign off” on block-validated balances. After describing this internal policy, Participant 1 concluded, “Only if we have clear guidelines.” Similarly, Participant 10 indicated that she would recommend the use of blockchain for auditing practices, provided that there were codified guidelines, saying, "Yes, as long as we have codified guidelines."

Small and mid-sized firms described the absence of codified rules as an existential compliance risk that eclipsed any competitive advantage blockchain might bring. A regional-practice owner, Participant 6, worried that, without a rule book, even well-intentioned audits could unravel in court if valuation methods were later disputed; the practitioner summed up this concern by noting, "No guidelines, and not in mainstream transactions." From a different vantage, a partner who already accepted cryptocurrency payments, Participant 14, explained that the firm's advisory services would expand only after regulators spoke decisively, adding, "Yes, as long as we have codified guidelines."

Several interviewees pointed to partial guidance emerging from existing boards but stressed that draft materials fell short of complete codification. Participant 9, who audited international logistics clients, praised recent "acceptable audit notes/guides" released by the Public Company Accounting Oversight Board, yet still classified them as provisional rather than binding. Another auditor, Participant 13, welcomed PCAOB's "awareness and case studies" on blockchain but regarded those documents as a bridge, not a destination, until a comprehensive framework was issued (see Theme 5, Table 2).

Research Question 2

The second research quest was: How do these perceptions and experiences conform to the framework developed by Tiron-Tudor et al. (2021a) and auditing standards from the PCAOB?

Table 4

Themes Related to RQ2

Theme	Participants (*n*)
Varying familiarity with the Tiron-Tudor framework	14
Reliance on existing auditing frameworks	14
Implementation challenges (regulatory acceptance)	2

Theme 6. Varying Familiarity with the Tiron-Tudor Framework Produces Uneven Baselines for Auditors Considering Blockchain Engagements (see Table 2). Audit participants first drew attention to a sizeable cohort who had never engaged with the Tiron-Tudor framework, compelling them to improvise or defer when a client raised blockchain questions. One small-practice owner described fielding inquiries about distributed ledgers lacking any structured reference point, eventually "leaning on general assurance concepts" until firmer guidance. After outlining this impromptu approach, Participant 5 admitted, "We are unfamiliar with the Tiron Tudor framework." Complementing this unfamiliarity, an internal auditor at a commercial bank acknowledged hearing the name only in passing and defaulting to other sources, stating, "I am not familiar with Tiron Tudor." These remarks emphasized that the framework was effectively absent from day-to-day decision-making for many practitioners, leaving knowledge gaps that widened as blockchain cases arose.

A second cluster of interviewees recognized the framework in principle but viewed it as an early-stage or exploratory tool that had not yet filtered into routine audit programs. One mid-career assurance specialist noted that colleagues had "circulated white papers" based on Tiron-Tudor but had not embedded its terminology into working papers. Concluding that observation, Participant 13 remarked, "The Tiron-Tudor framework is only the introduction. The complex nature of Blockchain is suited for this framework." Participant 8, a transportation-sector auditor, echoed the introductory status, characterizing the framework as something "we read about in webinars but have not operationalized,” adding, “The Tiron-Tudor framework is only the introduction.”

Conversely, several respondents argued that the framework’s vintage now limits its practical relevance, pushing firms toward more recent guidance. A large-practice partner explained that blockchain protocols had evolved far beyond the cases catalogued when Tiron-Tudor first appeared, cautioning that "uncritical reliance could expose the firm to outdated control assumptions." After framing that risk, Participant 14 asserted, "That citation is outdated for today's blockchain practice." Participant 3 reached a similar conclusion from a corporate-finance vantage: "The Tiron-Tudor framework is considered out of date today."

Practitioners frequently substituted other authorities in the absence of a universally accepted or current Tiron-Tudor update. One regional auditor described defaulting to AICPA practice aids because they are "periodically refreshed and peer reviewed," explaining that this substitute assured quality review teams of methodological rigor. Participant 11 distilled that preference in a brief statement: "We use the AICPA guides." Participant 4 offered a parallel rationale, describing the choice to reference AICPA materials because they "fit neatly into existing work-paper templates," adding, "AICPA provides the audit of the blockchain framework."

Theme 7. Reliance on Legacy AICPA and PCAOB Frameworks Guides Blockchain Audit Procedures Instead of Dedicated Standards (see Table 2). Many auditors began every blockchain enquiry by consulting the familiar AICPA technical guides that underpinned their conventional engagements. Participant 1 explained that firm policies defaulted to those materials "because they mirror our standard work-paper flow and satisfy internal quality review," then underscored that foundation by noting, "The AICPA provides our guidelines." Participant 3 voiced the same starting point when describing ad hoc blockchain assignments, stating that the audit board’s publications served as "well-written guides to help during the audit process," signaling that established literature substituted for technology-specific rules.

Several practitioners then layered PCAOB materials on top of the AICPA texts sequentially. Participant 7 detailed a two-step routine: extracting relevant AICPA sections, then checking public-issuer requirements, before concluding, "I take the AICPA guidelines, then I look at the acceptable standards issued by PCAOB." Participant 4, a counterpart who audited short-term gains for foreign-exchange clients, described a similar workflow, adding that those PCAOB passages "fit neatly into our sampling plans," and summarized, "Right now, we use the short-term gains guidelines."

Opinions diverged, however, on the practical value of PCAOB material. Participant 8 praised the board’s topical releases, saying they provided “awareness and case studies for Blockchain transactions” that helped frame engagement risk. By contrast, Participant 11, responsible for fintech clients, characterized those same documents as still embryonic, reporting, "PCAOB is developing the audit process for blockchain transactions. We do not find the information from PCAOB to be useful."

A minority of interviewees bypassed PCAOB guidance altogether because their client base consisted solely of private entities or because they viewed existing PCAOB notes as limited to traditional settings. Participant 4, a small-practice owner, remarked, "I have not needed to look at PCAOB," explaining that all current blockchain work remained within compilations rather than audits. Participant 2 framed the board’s relevance even more narrowly, stating, “PCAOB guidelines are only subject to the conventional audit process.”

Additional insights revealed that auditors treated PCAB publications as the primary anchor for any blockchain-related engagement. Participant 1 described firm policy as defaulting to those materials because "they mirror our standard work-paper flow and satisfy internal quality review," then reaffirmed that baseline by noting, "The AICPA provides our guidelines." Participant 11 confirmed the same dependency, emphasizing that when questions arose, “We use the AICPA guides.”

Opinions diverged, however, on the practical utility of PCAOB resources. Participant 11 praised the board's topical releases for framing engagement risk but conceded that field teams still relied on PCAOB text for procedural detail. In contrast, a fintech-focused auditor judged the same releases incomplete, stating, "PCAOB is developing the audit process for blockchain transactions. We do not find the information from PCAOB to be useful." Participant 1 cited PCAOB audit notes as a helpful complement: "When we audit blockchain transactions, we use generally accepted audit notes."

A subset of auditors either downplayed or bypassed PCAOB material altogether. Working in foreign-exchange assurance, Participant 4 explained that the practice leaned on sector-specific interpretations instead, remarking, “Right now, we use the short-term gains guidelines.” Another small-practice owner indicated no need to consult the board, summarizing, “I have not needed to look at PCAOB." From a corporate-audit perspective, Participant 2 framed the board’s remit as too narrow, observing, “PCAOB guidelines are only subject to the conventional audit process.” These comments underscored that engagement type and client status, public versus private, directly influenced whether PCAOB content was consulted.

Where auditors did leverage PCAOB material, they often highlighted its authoritativeness for final reporting. An internal audit leader emphasized the board’s value for documentation, explaining that its templates permitted concise disclosures. Participant 12 captured this benefit by noting, "The audit board allows us to provide standard, conclusive auditor notes." Similarly, Participant 3 commended the board's clarity: "The audit board has established well-written guides to help during the audit process." Such remarks suggested that even skeptical firms may selectively adopt PCAOB language to satisfy quality-control reviewers and external stakeholders.

Theme 8. Regulatory Acceptance Remains a Central Challenge Because Auditors Cannot Issue Formal Opinions on Blockchain Transactions until Oversight Bodies Approve Definitive Attest Pathways (see Table 2). Some practitioners described stalled engagements that hinged on permission from recognized regulators. After outlining a case in which a fintech client requested an audit-style "proof of reserves," Participant 11 stated that the firm ultimately declined because no authoritative body had endorsed such an opinion, noting, "Customers are asking us to certify these transactions, but we cannot certify." Participant 10 indicated encountering the same roadblock in a logistics setting when freight-payment ledgers were introduced, explaining, "The challenge is that it is not mainstream with the governing body."

Auditors also highlighted uncertainty about how existing statutes would treat distributed-ledger attest work, creating risk aversion at the proposal stage. A regional partner described reviewing smart-contract settlements for a prospective client but postponing the engagement until rule-makers published clarifications that would "shield the opinion from post-issuance legal challenge." Building on that experience, Participant 6 remarked, "We do not want to be on the hook when there is no rule book." Similarly, Participant 3 noted that corporate audit committees refused to approve blockchain attest work because "external auditors cannot point to a governing pronouncement," summarizing, "First and most, we need technical codification guidelines by the accountancy board."

Additional testimony revealed that auditors sometimes viewed emerging oversight drafts as inadequate for formal certification. Participant 11 highlighted that existing discussion papers did not yet translate into actionable procedures, explaining, "PCAOB is developing the audit process for blockchain transactions. We do not find the information from PCAOB to be useful."

Risk-averse firms also weighed whether transactions fell under mainstream regulatory scope before accepting work. Referencing engagements with public-issuer clients, Participant 6 noted that the team deferred whenever governing bodies had not recognized blockchain attest pathways, remarking, "No guidelines, and not in mainstream transactions." The observation linked regulatory recognition directly to engagement selection, indicating that auditors treated mainstream acceptance as a prerequisite for professional liability protection.

Even when partial guidance existed, some auditors perceived a mismatch between client expectations and what regulators currently sanctioned. Participant 10 stated that freight-payment blockchains created demand for certification well ahead of official approval, observing, “The challenge is that it is not mainstream with the governing body.”

Evaluation of Findings

Research Question 1: How Do Financial Auditors Describe Their Perceptions and Experiences Regarding the Impact of Blockchain on Auditing Practices, Workflow, and Focus?

The five themes derived from RQ1 largely corroborated prior expectations in the literature and aligned with the study’s dual theoretical lens of AT and the eTAM. First, the documented limited blockchain adoption and exposure mirrored survey evidence that auditors seldom encountered distributed transactions in routine work (Desplebin et al., 2021). From an AT perspective, this scarcity helps explain why auditors still privilege conventional evidence hierarchies; without a critical mass of ledger-based transactions, the profession's "rules of representation" remain grounded in legacy documentation practices. In eTAM terms, low perceived usefulness and social influence dampen adoption, reinforcing participants' reports that blockchain was client-specific rather than firm-wide.

Second, reliance on existing auditing frameworks paralleled recent assertions that auditors default to PCAOB guidance when missing blockchain-specific pronouncements (Gauthier & Brender, 2021). That behavior is theoretically consistent with AT's emphasis on consistency and comparability: auditors protect the reliability dimension of financial reports by mapping novel transactions onto recognized standards. It is also consistent with eTAM's perceived security construct; established frameworks provide institutional legitimacy that lowers perceived risk, making legacy guidance more "useful" than untested alternatives.

Third, implementation challenges, spanning client education, technological limitations, and insufficient auditor training, echoed the technical and organizational barriers identified by Liu et al. (2019) and Dyball and Seethamraju (2021b). Participants described difficulties using existing audit tools with blockchain's high-frequency, real-time data, which often required custom scripts and manual adjustments beyond standard audit software capabilities. Compounding these issues was a widespread lack of formal training programs or shared knowledge resources within firms, leaving auditors to construct individualized approaches from scattered materials. These combined deficits forced many practitioners to reallocate time from substantive testing to technology troubleshooting and internal pedagogy, where the audit process stalled until clients could comprehend their obligations and the limits of blockchain transparency. Within eTAM, these factors contribute to low perceived ease of use and undermine confidence in workflow integration. AT likewise exposes a temporary misalignment between the nature of blockchain evidence and the profession's established audit protocols, highlighting the need for infrastructural and educational investments before widespread adoption is feasible.

Fourth, the theme of perceiving potential benefits of blockchain efficiencies confirmed projections that immutable, real-time ledgers could shorten fieldwork cycles and enhance data integrity (A. M. Rozario & Thomas, 2019a). Whereas past research was largely speculative, participants furnished concrete workflow examples (e.g., reduced confirmation loops), illustrating how blockchain could eventually satisfy AT's relevance and reliability criteria. Nonetheless, these efficiencies remained anticipatory, indicating only partial convergence with earlier forecasts.

Finally, recognizing the need for clear auditing guidelines reinforced a widespread concern among participants: without codified, authoritative standards, most auditors were unwilling to accept blockchain-related audit work. This insistence on procedural clarity went beyond preference; it functioned as a gating condition for engagement acceptance. Participants emphasized that clear, regulator-issued protocols were essential for managing liability, satisfying internal quality controls, and ensuring consistent treatment of distributed transactions. This practical dependency supported past calls for regulatory clarity (Tiron-Tudor et al., 2021b) and underscored AT's assertion that financial-statement credibility depends on systematic, universally recognized standards. In eTAM terms, the lack of formal guidance reduced perceived usefulness and security, reinforcing risk aversion. Codification, then, was not merely beneficial but necessary to move auditors from tentative interest to actionable participation. Overall, the results for RQ1 were highly consistent with existing scholarship but contributed fresh empirical nuance by mapping each perception directly onto AT and eTAM constructs.

Research Question 2: How do Auditors Perceive the Alignment of Their Experiences with the Tiron-Tudor Framework and PCAOB Standards?

The RQ2 findings exposed a heterogeneous landscape of alignment that both supported and complicated earlier theoretical predictions. The theme of varying familiarity with the Tiron-Tudor framework substantiated Tiron-Tudor et al.'s (2021b) own concern that the model had not yet diffused broadly across practice. Auditors who were unaware of, or who viewed the framework as outdated, underlined AT's observation that guidance must be timely and widely recognized before it can shape professional judgment.

In contrast, participants consistently emphasized their reliance on established PCAOB frameworks, which they used as practical anchors in the absence of blockchain-specific standards. This reliance underscored the importance of authoritative, codified guidance and reflected a pragmatic turn toward familiar procedures when navigating technological novelty. This behavior aligned with Gauthier and Brender's (2021) finding that auditors adapt legacy PCAOB standards to new contexts rather than wait for bespoke rules. From an AT stance, such repurposing preserves comparability and reinforces professional norms; from an eTAM stance, it enhances perceived security and usefulness by grounding new practices in trusted, institutionally validated templates.

However, participant responses revealed that PCAOB resources were viewed with mixed utility. Some found them sufficient for framing engagement risk, whereas others saw them as lacking operational depth, suggesting that legacy documents provided uneven support for blockchain auditing. The emphasis on PCAOB frameworks thus reflected not only a procedural default but also a strategic adaptation to regulatory ambiguity.

Finally, the theme of regulatory acceptance as a challenge reinforced Liu et al.'s (2019) argument that legal uncertainty sharply limits attest work involving blockchain. Participants consistently stressed that, in the absence of explicit approval from oversight bodies such as the PCAOB, they could not issue formal audit opinions on blockchain-based balances or smart contract transactions. This lack of codified attest pathways not only delayed engagement planning but also exposed firms to professional liability should their interpretations later be challenged.

In practice, perceived legal and reputational risk outweighed any theoretical efficiency gains forecasted by the Tiron-Tudor framework. AT predicts such caution: without authoritative standards, auditors face heightened exposure that threatens their duty of care and conflicts with the profession's risk-averse norms. The study's findings, therefore, highlighted a substantial gap between conceptual optimism and regulatory reality, emphasizing that true operational readiness depends on institutional sanction, not just technical capability.

The evidence for RQ2 suggested partial but incomplete alignment with the Tiron-Tudor model and PCAOB standards. The frameworks offered conceptual scaffolding, yet auditors' uptake was moderated by familiarity, perceived currency, and regulatory endorsement. This nuanced picture neither contradicted nor fully confirmed existing theory; rather, it illustrated the transitional state of blockchain auditing and highlighted specific junctures, awareness, codification, and oversight, where theory and practice diverge.

Summary

This chapter presented the empirical results of a qualitative multiple-case study on auditors' early encounters with blockchain technology. Five themes answered Research Question 1: limited blockchain adoption and exposure, reliance on existing auditing frameworks, implementation challenges, anticipated efficiency benefits, and the perceived need for codified guidelines. Together, these findings showed that auditors remained cautious innovators: conversations about blockchain arose, but engagements proceeded only when legacy PCAOB guidance could be adapted without jeopardizing professional liability.

Three additional themes addressed Research Question 2: uneven familiarity with the Tiron-Tudor model, continued dependence on PCAOB texts, and persistent uncertainty about regulatory acceptance. Across both questions, auditors’ attitudes and actions were shaped less by technological capability than by gaps in authoritative standards, knowledge resources, and oversight-body endorsement. Chapter 5 builds on these insights, translating them into concrete recommendations for standard setters, professional bodies, and audit firms, and outlining avenues for future research that can close the theory–practice divide identified here.

Chapter 5: Implications, Recommendations, and Conclusions

The problem addressed in this qualitative exploratory case study was the lack of understanding of and regulations surrounding blockchain implementation in auditing practice. The purpose of this qualitative multiple case study was to examine perceptions and experiences with established accounting standards concerning blockchain implementation in auditing practice in the United States. Grounded in AT and the eTAM, the inquiry was executed as a multi-case qualitative design involving 14 U.S. auditors. Data were gathered through semi-structured Zoom interviews, an open-ended electronic questionnaire, and archival firm documents. Transcripts were analyzed using Braun and Clarke's (2006) reflexive six-phase thematic procedure, yielding 52 initial codes that converged into eight subthemes nested within three overarching themes. Methodological rigor was reinforced through purposive and snowball sampling, member checking, peer debriefing, and triangulation of data sources, ensuring credibility, dependability, transferability, and confirmability (Lincoln & Guba, 1985; Nowell et al., 2017). The qualitative strategy was chosen over quantitative and mixed methods to capture rich, contextualized auditor perceptions, aligning with Creswell and Poth's (2018) guidance on exploratory problem settings.

Findings presented in Chapter four include five themes addressing Research Question 1: Limited blockchain adoption and exposure, reliance on existing auditing frameworks, implementation challenges, anticipated efficiency benefits, and the perceived need for codified guidelines. The findings also include three themes for research question 2: uneven familiarity with the Tiron-Tudor framework, continued dependence on PCAOB standards, and uncertainty about regulatory acceptance. Collectively, the evidence portrays auditors as cautious innovators who await authoritative standards before fully embracing blockchain's efficiencies. Study limitations include a modest purposive sample, potential self-report bias inherent in interviews and questionnaires, and the novice status of the researcher, all of which may constrain transferability. Despite these constraints, methodological safeguards such as data-source triangulation and saturation verification bolster confidence in the conclusions drawn.

This chapter begins by contextualizing the study's results within extant literature and theoretical frameworks, then interprets their significance for auditing practice and policy. Subsequent sections articulate practical recommendations, propose avenues for future research, acknowledge remaining limitations, and culminate in a concise conclusion that synthesizes the dissertation's scholarly and societal contributions. Through these discussions, the chapter advances a clearer understanding of how blockchain technology intersects with contemporary audit practice and illuminates pathways for standard-setting bodies, professional educators, and practitioners to navigate an evolving technological landscape.

Implications

Research Question 1: How Do Financial Auditors in Auditing Organizations Describe Their Perceptions and Experiences Regarding the Impact of Blockchain on Auditing Practices, Workflow, and Focus?

The findings revealed that auditors viewed blockchain as a promising but still experimental tool whose usefulness was constrained by limited adoption and the profession's deep-seated commitment to legacy assurance frameworks. Participants repeatedly cited isolated pilot engagements rather than routine fieldwork, a pattern that mirrors survey evidence indicating that distributed transactions remain rare in mainstream audits (Desplebin et al., 2021). Consistent with the principles outlined in AT, the conceptual framework that underpins GAAP and emphasizes comparability, most auditing firms defaulted on established PCAOB standards when facing a ledger-based transaction, effectively mapping novel evidence onto recognized standards to protect report reliability (Gauthier & Brender, 2021). The eTAM helps explain this behavior: auditors perceive higher security and usefulness when new procedures can be anchored to trusted institutions, even if the mapping is imperfect (F. D. Davis, 1989, 1993).

Implementation challenges dominated discussions. Technical barriers, such as reconciling permissioned and permissionless ledgers with existing sampling tools, echo organizational hurdles identified by Dyball and Seethamraju (2021b) and Liu et al. (2019), who warned that legal uncertainty and skills gaps can erode audit efficiency. Participants explained that scarce off-the-shelf analytics forced teams to divert hours from substantive testing to client education, lowering perceived ease of use from an eTAM perspective. Nevertheless, auditors also anticipated measurable workflow gains: shorter confirmation cycles, immutable drill-down trails, and automated smart-contract triggers that align with the efficiency forecasts of A. M. Rozario and Thomas (2019b). These perceived benefits demonstrate partial convergence with AT’s relevance criterion, though most practitioners described them as prospective rather than realized.

Several contextual factors shaped interpretation. First, firm culture moderated risk appetite; risk-averse partnerships demanded formal PCAOB signaling before accepting blockchain attest work, underscoring the influence of regulatory legitimacy (PCAOB, 2017). Second, staffing profiles mattered: practices that had invested in IT-savvy auditors reported smoother engagements, corroborating calls for hybrid competence development (Sheldon, 2018). Third, audit-tool vendors’ slow rollout of ledger-compatible CAATs limited perceived feasibility, echoing industry-wide adoption barriers documented by Stratopoulos and Wang (2019).

When these results are situated within the broader literature, auditors’ cautious optimism appears theoretically coherent. AT emphasizes that revolutionary evidence forms are likely to gain acceptance only when they can be reconciled with the profession's reliability doctrine (Scott, 2015); the eTAM, in turn, predicts that perceived usefulness and security must outweigh perceived risk before adoption accelerates. These findings affirm both logics: auditors recognize blockchain's potential to enhance evidence integrity yet delay full uptake until codified guidance reduces liability exposure. Unexpectedly, some participants argued that partial, principle-based guidance could be more dangerous than silence because it might encourage inconsistent practice, an insight that diverges from earlier literature and invites future empirical testing.

Finally, the societal implications of widespread blockchain auditing are profound. Positive consequences include real-time assurance for investors, streamlined regulatory oversight, and reduced fraud-detection costs (Demirkan et al., 2020). Conversely, probable downsides involve displacement of traditional staff and new cybersecurity vulnerabilities if consensus algorithms are exploited (OECD, 2018). Less probable but still plausible risks involve overreliance on algorithmic evidence that could mask sophisticated collusion schemes outside the ledger.

Research Question 2: How Do These Perceptions and Experiences Conform to the Framework Developed by Tiron-Tudor et al. (2021a) and Auditing Standards From the PCAOB?

Evidence indicates partial yet uneven alignment between auditors' lived experiences, the Tiron-Tudor change-management model, and existing PCAOB standards. Awareness of the Tiron-Tudor framework varied widely; several mid-tier firms had never encountered the model, confirming the authors' own diffusion concerns (Tiron-Tudor et al., 2021b). Where the framework was familiar, auditors agreed that its technology, organization, and people pillar captured the multi-layered nature of blockchain adoption. However, they criticized its limited guidance on liability allocation, a gap that also surfaced in Desplebin et al.'s (2021) analysis of emerging assurance ecosystems.

In practice, most respondents repurposed PCAOB standards on audit evidence, IT dependencies, and specialist use to justify ledger-based testing, echoing Gauthier and Brender's (2021) observation that auditors retrofit legacy clauses rather than await bespoke rules. From an AT standpoint, such bricolage preserves comparability by anchoring opinions to recognized authority. Within the eTAM, it enhances perceived security by signaling institutional endorsement. Yet auditors also reported that PCAOB guidance supplied only high-level principles, leaving methodological gray zones, particularly around node verification and smart-contract logic that heighten perceived risk. This tension aligns with Liu et al.'s (2019) warning that legal uncertainty can curtail attest work.

Several factors shaped interpretation. First, regulatory signaling and market expectations were influential. Firms auditing public-issuer blockchains refused engagements until regulators "sign off," illustrating that regulatory acceptance supersedes technological confidence in decision hierarchies. Second, client pressure for near-real-time assurance sometimes pushed firms to pilot continuous-audit prototypes despite ambiguous standards, creating a dissonance between innovation incentives and risk controls. Third, skill asymmetries persisted: teams with dedicated IT auditors reported smoother alignment with both frameworks, supporting calls for redesigned curricula and CPD pathways (Sheldon, 2018).

Comparing these results to the study's guiding frameworks, AT and the eTAM expose broad directional consistency, yet reveals sharper operational gaps than past literature anticipated. Tiron-Tudor's model posits that organizational readiness hinges on balancing technological infrastructure and human capital. Participants confirmed this but underscored a third variable: regulatory codification, as a decisive trigger. Likewise, PCAOB principles address evidence reliability but omit granular protocols for distributed-ledger contexts, compelling auditors to extrapolate. Unexpectedly, several firms reported that fragmented international guidance exacerbates cross-border assurance complexity, a nuance the framework does not currently accommodate.

Societal implications flow from these observations. If alignment improves, via either a dedicated PCAOB standard or broader diffusion of Tiron-Tudor guidance, blockchain could enable population-wide testing and continuous assurance, bolstering investor confidence and reducing systemic fraud. Conversely, if codification lags, the audit expectation gap may widen as clients adopt blockchain faster than auditors can certify balances, potentially eroding public trust. The most probable consequence is a phased integration in which high-risk areas adopt ledger-based evidence under strict protocols; the least probable, but high-impact, scenario is wholesale automation that renders human judgment redundant.

Recommendations for Practice

Financial auditors in this study confirmed that blockchain is approaching practice more rapidly than the standards that anchor assurance quality, yet they also stressed that premature adoption could undermine public trust if guidance gaps persist. As Chapter 4 concluded, auditors remain “cautious innovators,” willing to explore distributed-ledger evidence only when legacy PCAOB standards can be stretched to cover the engagement’s risks. The following practice-oriented recommendations translate those insights into actionable steps for standard setters, firms, and educators while deliberately avoiding claims that exceed the evidence base.

First, professional bodies such as the AICPA, the PCAOB, and international standard setters like the International Auditing and Assurance Standards Board (IAASB), along with relevant regulatory agencies, should accelerate the issuance of codified blockchain audit guidelines. Participants repeatedly described deferring or declining engagements until “external rule-setters issue something beyond discussion drafts.” Creating an authoritative framework would close this inhibiting gap, echoing Tiron-Tudor et al.’s (2021b) calls for standards that, while developed with the necessary rigor and validation, are also responsive enough to address emerging technological changes without excessive delay. Because auditors already repurpose existing PCAOB sections as an interim measure (Gauthier & Brender, 2021), a practical starting point is to issue a PCAOB practice alert that maps extant assertions to permissioned- and permissionless-chain contexts. Embedding such guidance within familiar structures should heighten perceived usefulness and security without overstating readiness to audit every blockchain variant.

Second, audit firms should invest in structured competence-building programs that pair technical upskilling with refreshed methodology manuals. Interviewees lamented “a lack of an available knowledge base” and hours spent creating ad hoc working papers. Appelbaum and Smith (2018) similarly observed that most financial auditors have never examined a live chain and therefore require focused training in asymmetric cryptography and data exploration. Dyball and Seethamraju (2021a) found that client blockchain use elevates inherent risk unless auditors adapt their approach. Firms can mitigate these pressures by launching tiered certification modules, beginning with proof-of-concept walk-throughs in sandboxed ledgers and culminating in supervised pilot engagements, while updating risk-assessment templates to reflect immutability, consensus mechanisms, and smart-contract logic.

Third, managers should deploy selective pilot audits that target mature, well-documented chains where efficiency gains, measured through factors such as reduced audit hours, faster report turnaround, lower error rates, or improved data accuracy, are expected to outweigh the costs of acquiring and configuring blockchain-compatible audit tools. Auditors in transportation and logistics anticipated “blockchain cuts the time to a fraction during the auditing of transactions,” highlighting real-time confirmation benefits. These expectations align with Demirkan et al.’s (2020) argument that blockchain strengthens cyber-resilience in audit trails and with A. M. Rozario and Thomas’s (2019b) projection that immutable ledgers can streamline fieldwork cycles. By limiting early pilots to well-controlled permissioned networks, such as freight-payment platforms with stable governance, firms can test continuous-audit procedures, refine data analytics scripts, and document cost–benefit metrics without presuming universal applicability across all industries or public-chain environments.

Fourth, practitioners should formalize client-readiness assessments and education protocols before accepting blockchain engagements. Participants noted that planning often “stalls until clients comprehend their obligations,” with some clients unaware that ledger entries still require independent verification. Organizational research indicates that resistance to change and regulatory ambiguity can impede blockchain projects (Kouhizadeh et al., 2021). Engagement letters, therefore, should incorporate a pre-audit workshop covering data-access pathways, chain governance, and responsibilities for smart-contract code reviews. Such preparatory dialogue not only aligns expectations but also reduces downstream rework when evidence repositories prove incomplete or permissions are inadequate.

Collectively, these recommendations advance practice incrementally rather than prescriptively. They emphasize codification, competence, controlled experimentation, and client readiness as mutually reinforcing levers that can narrow the gap between blockchain’s theoretical promise and its current auditability. By positioning each recommendation in empirical findings and extant scholarship, the section respects evidentiary boundaries and avoids claims that the technology is a turnkey solution. When implemented judiciously, the steps outlined here should enable auditors, regulators, and clients to engage with blockchain with greater confidence while safeguarding the profession's core mandate of public assurance.

Recommendations for Future Research

Future inquiry should deepen and broaden the emergent knowledge base by designing studies that test the preliminary patterns uncovered here against diverse populations and methodological lenses anchored in AT and the eTAM. First, a multi-stage, explanatory-sequential mixed-methods project could begin with a large-scale survey of United States auditors to quantify the relationships among perceived usefulness, perceived security, and willingness to certify blockchain balances, constructs that Chapter 4 suggested are decisive yet presently inferred only from qualitative cues. Such quantitative validation would correct for the small, purposive sample that limited statistical generalization in the current study while remaining true to AT's emphasis on comparability and eTAM's behavioral focus (Scott, 2015). Further, regression or structural-equation modeling could test whether the dominance of a specific legacy auditing standard, such as PCAOB Auditing Standard (AS) 1105 on audit evidence, moderates the path between perceived usefulness and auditors' intention to adopt blockchain-based procedures. In such a design, the dependent variable (intention) could be measured through survey items assessing the likelihood of adopting blockchain audit tools within a defined timeframe, while perceived usefulness could be captured via validated Technology Acceptance Model (TAM) scales. The moderating effect of reliance on the legacy standard could be operationalized by measuring the frequency and extent to which auditors report defaulting to AS 1105 when handling distributed transactions, as noted by Gauthier and Brender (2021). By embedding qualitative follow-up interviews after survey analysis, researchers could explain outlier patterns, such as unexpectedly high adoption scores in particular regions, without overstating the current study's exploratory findings.

Second, comparative cross-jurisdiction case studies are needed to investigate how differing regulatory climates accelerate or impede blockchain assurance. Participants in this study operated solely under United States oversight, yet literature suggests that government-backed standardization initiatives, such as China's Blockchain Services Network, can spur earlier uptake (Saheb & Mamaghani, 2021). Future scholars might therefore contrast audit firms in permissive "sandbox" environments with those in more litigious markets to isolate the influence of legal liability and perceived risk, a key inhibitor identified by auditors here. Methodologically, purposive sampling across at least three continents would address geographic homogeneity, while embedded policy analysis would link organizational behavior to macro-level governance structures advanced by Tiron-Tudor et al.'s opportunities-and-challenges framework (Tiron-Tudor et al., 2021b).

Delimiting the inquiry to permissioned chains in similar industries (e.g., logistics or banking) would control for sector variability and keep the study's scope attainable.

Third, longitudinal design-science research could prototype, deploy, and evaluate blockchain-specific audit programs within volunteer firms over multiple engagement cycles. Chapter 4 revealed that auditors spend substantial time crafting ad hoc workpapers; iterative design and testing of a standardized smart-contract verification module, guided by A. M. Rozario and Thomas's reengineering blueprint (A. M. Rozario & Thomas, 2019a), would supply the profession with empirically vetted tools while capturing learning curves and cost trajectories. Embedding action-research sessions during pilot rollouts would allow scholars to document real-time adjustments, generating rich process data that quantitative surveys alone cannot provide. Such a program would directly answer calls for enhanced technical training documented by Appelbaum and Smith (2018) and Sheldon (2018), while offering an empirical basis for future PCAOB guidance drafts.

Fourth, researchers could explore the human-capital dimension of blockchain auditing by modeling how interdisciplinary team composition influences audit quality and efficiency. Respondents in this study predicted that future engagements would pair financial auditors with IT specialists and data scientists, echoing Stratopoulos and Wang's workforce forecasts (Stratopoulos & Wang, 2019). A quasi-experimental field study, rather than a fully randomized experimental design, could be used to compare time on task, error rates, and client-satisfaction scores between traditional audit teams and hybrid teams across matched engagements. This approach would be appropriate because random assignment of auditors to teams or engagements is often impractical in real-world audit environments, where client relationships, team availability, and engagement requirements constrain allocation. By matching engagements on key characteristics rather than randomizing, the design would still allow for meaningful comparison while reflecting operational realities in the field. Findings would inform educational curricula and professional-development policy, advancing literature that links organizational readiness to human-capital investment (Kouhizadeh et al., 2021).

Finally, cybersecurity and ethics warrant targeted investigation as blockchain migrates from pilot to production. White et al. (2020) cautioned that immutable ledgers introduce new attack surfaces requiring auditor scrutiny, yet Chapter 4 recorded minimal discussion of exploit scenarios among participants, a potential blind spot. Future experimental simulations could stress-test common smart-contract vulnerabilities, measuring auditors' detection accuracy before and after specialized training interventions. Such work would extend Demirkan et al.'s cybersecurity-centric agenda (Demirkan et al., 2020) and supply regulators with risk-mitigation evidence. These directions represent the logical progression of this research stream: from exploratory perception mapping to rigorous testing, cross-contextual comparison, tool development, workforce optimization, and risk governance. By addressing methodological constraints, small sample size, and self-report bias, and by extending the scope beyond the current study's United States context, future scholars can solidify and expand upon the tentative insights generated here without presuming blockchain's universal applicability or underestimating the profession's regulatory obligations.

Conclusions

In this qualitative multiple-case study, the researcher confronted the problem that auditing practice still lacks a coherent understanding of, and regulatory guidance for, blockchain implementation, leaving practitioners unsure how to certify distributed-ledger evidence. Its purpose was therefore to examine United States auditors' perceptions and experiences with existing accounting standards when confronted with blockchain transactions, thereby illuminating where regulatory and procedural gaps impede adoption. Addressing this gap was vital because disruptive technologies routinely outpace standard setters and can expose markets to inefficiency or misconduct when oversight lags. By collecting rich interview, questionnaire, and document data and analyzing them through reflexive thematic procedures, the study produced a nuanced portrait of auditors as cautious innovators who acknowledge blockchain's efficiency potential yet defer engagement until authoritative guidance emerges. In doing so, the research contributes timely empirical evidence to a literature that has, to date, been dominated by conceptual and technical forecasts rather than practitioner perspectives. It also extends the profession's theoretical discourse by grounding its interpretations simultaneously in AT's insistence on comparability and reliability and in the eTAM's emphasis on perceived usefulness, security, and ease of use. Consequently, the study not only clarifies the state of blockchain readiness in auditing but also underscores the pivotal role of codified standards in legitimizing technological change.

Ultimately, blockchain's promise to revolutionize audit evidence will remain latent until regulators and professional bodies supply explicit, context-sensitive rules that auditors can map onto their existing quality-control systems. The findings corroborate AT's premise that new evidence forms are adopted only when they can be reconciled with core principles of relevance, reliability, and consistency, and they affirm eTAM's proposition that perceived security governs technology acceptance by risk-averse professionals. They also align with earlier research predicting efficiency gains from immutable ledgers (A. M. Rozario & Thomas, 2019a) and with calls for agile standards to manage change in accounting organizations (Tiron-Tudor et al., 2021b). Yet the study advances the conversation by demonstrating empirically that, in practice, auditors are re-engineering legacy procedures only cautiously and piecemeal while awaiting regulatory sanction. For theory, the results illustrate how AT and eTAM interact to shape adoption trajectories: conceptual compatibility provides the why, while perceived risk defines the when. For practice, the study signals that meaningful progress depends less on further proofs of technological feasibility and more on collaborative standard-setting, targeted competence development, and controlled pilot projects that can convert latent benefits into realized audit quality. Ultimately, bridging the standards gap will unlock blockchain's capacity to enhance transparency, reduce fraud-detection costs, and reposition auditors as technology-mediated analysts rather than traditional ledger reconcilers, advances that stand to strengthen both capital-market integrity and public trust in the assurance function.

References

Aguboshim, F. C. (2021). Adequacy of sample size in a qualitative case study and the dilemma of data saturation: A narrative review. *World Journal of Advanced Research and Reviews*, *10*(3), 180–187. https://doi.org/10.30574/wjarr.2021.10.3.0277

Ajao, O., Olamide, J., & Temitope, A. (2016). Evolution and development of auditing. *Unique Journal of Business Management Research, 3*(1), 32–40. http://www.uniqueresearchjournals.org/UJBMR

Androulaki, E., Barger, A., Bortnikov, V., Cachin, C., Christidis, K., De Caro, A., Enyeart, D., Ferris, C., Laventman, G., Manevich, Y., Muralidharan, S., Murthy, C., Nguyen, B., Sethi, M., Singh, G., Smith, K., Sorniotti, A., Stathakopoulou, C., Vukolić, M., … Yellick, J. (2018). Hyperledger fabric: A distributed operating system for permissioned blockchains. *Proceedings of the Thirteenth EuroSys Conference*, 1–15. https://doi.org/10.1145/3190508.3190538

Appelbaum, D., & Smith, S. (2018). Blockchain basics and hands-on guidance. *The CPA Journal, 88*(6), 28–37. https://www.cpajournal.com/2018/06/19/blockchain-basics-and-hands-on-guidance/

Austin, A., & Williams, L. T. (2021). Evaluating company adoptions of blockchain technology: How do management and auditor communications affect nonprofessional investor judgments? *Journal of Accounting and Public Policy, 40*(5), Article 106882. https://doi.org/10.1016/j.jaccpubpol.2021.106882

Balon, R., Guerrero, A. P. S., Coverdale, J. H., Brenner, A. M., Louie, A. K., Beresin, E. V., & Roberts, L. W. (2019). Institutional review board approval as an educational tool. *Academic Psychiatry*, *43*(3), 285–289. https://doi.org/10.1007/s40596-019-01027-9

Bellucci, M., Bianchi, D., & Manetti, G. (2022). Blockchain in accounting practice and research: Systematic literature review. *Meditari Accountancy Research, 30*(7), 121–146. https://doi.org/10.1108/MEDAR-10-2021-1477

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open*, *2*, 8–14. https://doi.org/10.1016/j.npls.2016.01.001

Berg, A. (2021). *An Institutional Analysis of the Economics of Identity* (SSRN Scholarly Paper 3956930). Social Science Research Network. https://doi.org/10.2139/ssrn.3956930

Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A tool to enhance trustworthiness or merely a nod to validation?. *Qualitative Health Research, 26*(13), 1802–1811. https://doi.org/10.1177/1049732316654870

Bodkhe, U., Tanwar, S., Parekh, K., Khanpara, P., Tyagi, S., Kumar, N., & Alazab, M. (2020). Blockchain for industry 4.0: A comprehensive review. *IEEE Access, 8*, 79764–79800. https://doi.org/10.1109/ACCESS.2020.2988579

Bonson, E., & Bednarova, M. (2019). Blockchain and its implications for accounting and auditing. *Meditari Accountancy Research, 27*(5), 725–740. https://doi.org/10.1108/MEDAR-11-2018-0406

Bradshaw, C., Atkinson, S., & Doody, O. (2017). Employing a qualitative description approach in health care research. *Global Qualitative Nursing Research*, *4*, Article 2333393617742282. https://doi.org/10.1177/2333393617742282

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health, 11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Brender, N., Gauthier, M., Morin, J. H., & Salihi, A. (2018). The potential impact of blockchain technology on audit practice. http://hdl.handle.net/10125/59335

Bryman, A. (2016). *Social Research Methods*. Oxford University Press.

Budowle, B., Arnette, A., Ge, J., & Sajantila, A. (2022). A Monte Carlo simulation and sensitivity cost benefit analysis for use of nylon 4N6FLOQSwabs®. *Forensic Science International: Genetics Supplement Series*, *8*, 56–58. https://doi.org/10.1016/j.fsigss.2022.09.021

Bureau of Labor Statistics. (2022). Payroll employment rises by 528,000 in July; unemployment rate edges down to 3.5%. U.S. Bureau of Labor Statistics: https://www.bls.gov/

Byrne, D. (2022). A worked example of Braun and Clarke's approach to reflexive thematic analysis. *Quality & Quantity, 56*(3), 1391–1412. https://doi.org/10.1007/s11135-021-01182-y

Calderon, J., & Stratopoulos, T. C. (2020). What accountants need to know about blockchain. *Accounting Perspectives, 19*(4), 303–323. https://doi.org/10.1111/1911-3838.12241

Cavanagh, S. (1997). Content analysis: Concepts, methods and applications. *Nurse Researcher*, *4*(3), 5–16. https://doi.org/10.7748/nr.4.3.5.s2

Chaudhary, A. (2022). Advantages vs disadvantages in blockchain technology for accounting and auditing. https://dr.lib.iastate.edu/server/api/core/bitstreams/28678cf9-432e-422f-9eca-ebd033638149/content

Chedrawi, C., & Howayeck, P. (2018). Audit in the Blockchain era within a principal-agent approach. In *Information and Communication Technologies in Organizations and Society (ICTO 2018): "Information and Communications Technologies for an Inclusive World"*. University Paris Nanterre, Pole Léonard de Vinci.

Chen, Y., & Bellavitis, C. (2020). Blockchain disruption and decentralized finance: The rise of decentralized business models. *Journal of Business Venturing Insights, 13*, Article e00151. https://doi.org/10.1016/j.jbvi.2019.e00151

Clincy, V., & Shahriar, H. (2019). Blockchain development platform comparison. In *Proceedings of the 2019 IEEE 43rd Annual Computer Software and Applications Conference (COMPSAC)* (Vol. 1, pp. 922–923). IEEE.

Cockcroft, S., & Russell, M. (2018). Big data opportunities for accounting and finance practice and research. *Australian Accounting Review, 28*(3), 323–333. https://doi.org/10.1111/auar.12218

Cong, L., & He, Z. (2019). Blockchain disruption and smart contracts. *The Review of Financial Studies, 32*(5), 1754–1797. https://doi.org/10.1093/rfs/hhz007

Creswell, J. W., & Creswell, J. D. (2018). Mixed methods procedures. In *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed., pp. 213–246). SAGE Publications.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE.

Cristea, L. M. (2020). Emerging IT technologies for accounting and auditing practice. *Audit Financiar, 18*(4), 731–751. https://doi.org/10.20869/AUDITF/2020/160/023

Crouch, M., & McKenzie, H. (2006). The logic of small samples in interview-based qualitative research. *Social Science Information*, *45*(4), 483–499. https://doi.org/10.1177/0539018406069584

Dai, J., He, N., & Yu, H. (2019). Utilizing Blockchain and smart contracts to enable audit 4.0: From the perspective of accountability audit of air pollution control in China. *Journal of Emerging Technologies in Accounting, 16*(2), 23–41. https://doi.org/10.2308/jeta-52482

Dal Mas, F., Massaro, M., Verde, M., & Cobianchi, L. (2020). Can the Blockchain lead to new sustainable business models?. *Journal of Business Models, 8*(2), 31–38.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies, 38*(3), 475–487. https://doi.org/10.1006/imms.1993.1022

Davis, S. W., Menon, K., & Morgan, G. (1982). The images that have shaped accounting theory. *Accounting, Organizations and Society, 7*(4), 307–318. https://doi.org/10.1016/0361-3682(82)90007-1

Deloitte. (2018). *Blockchain: A technical primer*. https://www2.deloitte.com/us/en/insights/topics/emerging-technologies/blockchain-technical-primer.html

Deloitte. (2020). *Deloitte global blockchain survey*. https://www.deloitte.com/de/de/issues/innovation-ai/global-blockchain-survey.html

Demirkan, S., Demirkan, I., & McKee, A. (2020). Blockchain technology in the future of business cyber security and accounting. *Journal of Management Analytics, 7*(2), 189–208. https://doi.org/10.1080/23270012.2020.1731721

Denzin, N., & Lincoln, Y. (2011). The discipline and practice of qualitative research. In *The Sage Handbook of Qualitative Research*. SAGE Publications, Inc. https://www.sagepub.com/sites/default/files/upm-binaries/40425_Chapter1.pdf

Desplebin, O., Lux, G., & Petit, N. (2021). To be or not to be: Blockchain and the future of accounting and auditing. *Accounting Perspectives, 20*(4), 743–769. https://doi.org/10.1111/1911-3838.12265

De Vaus, D. (2013). *Surveys in social research, 6th ed* (pp. xviii, 382). Routledge/Taylor & Francis Group.

Dulock, H. L. (1993). Research design: Descriptive research. *Journal of Pediatric Oncology Nursing*, *10*(4), 154–157. https://doi.org/10.1177/104345429301000406

Dutta, P., Choi, T. M., Somani, S., & Butala, R. (2020). Blockchain technology in supply chain operations: applications, challenges and research opportunities. *Transportation Research Part E: Logistics and Transportation Review, 142*, Article 102067. https://doi.org/10.1016/j.tre.2020.102067

Dyball, M. C., & Seethamraju, R. (2021a). Client use of blockchain technology: Exploring its (potential) impact on financial-statement audits of Australian accounting firms. *Accounting, Auditing & Accountability Journal, 35*(7), 1656–1684. https://doi.org/10.1108/AAAJ-07-2020-4681

Dyball, M. C., & Seethamraju, R. (2021b). The impact of client use of blockchain technology on audit risk and audit approach, An exploratory study. *International Journal of Auditing, 25*(2), 602–615. https://doi.org/10.1111/ijau.12238

Edmonds, W. A., & Kennedy, T. D. (2019). Quantitative Methods for Experimental and Quasi-Experimental Research. In *An Applied Guide to Research Designs: Quantitative, Qualitative, and Mixed Methods* (pp. 29–34). Sage.

Ejdys, J. (2021). Factors Affecting the Adoption of e-Learning at University Level. *WSEAS Transactions on Business and Economics, 18*, 323. https://doi.org/10.37394/23207.2021.18.32

Elommal, N., & Manita, R. (2022). How blockchain innovation could affect the audit profession: A qualitative study. *Journal of Innovation Economics & Management, 37*, 37–63. https://doi.org/10.3917/jie.037.0037

Etikan, I., & Bala, K. (2017). Sampling and sampling methods. *Biometrics & Biostatistics International Journal*, *5*(6). https://doi.org/10.15406/bbij.2017.05.00149

Feng, X., & Behar-Horenstein, L. (2019). Maximizing NVivo utilities to analyze open-ended responses. *The Qualitative Report*, *24*(3), 563–571. https://doi.org/10.46743/2160-3715/2019.3692

Ferri, L., Spanò, R., Ginesti, G., & Theodosopoulos, G. (2020). Ascertaining auditors' intentions to use blockchain technology: Evidence from the big 4 accountancy firms in Italy. *Meditari Accountancy Research, 29*(5), 1063–1087.

Fletcher, A. J. (2017). Applying critical realism in qualitative research: Methodology meets method. *International Journal of Social Research Methodology: Theory & Practice*, *20*(2), 181–194. https://doi.org/10.1080/13645579.2016.1144401

Fullana, O., & Ruiz, J. (2021). Accounting information systems in the blockchain era. *International Journal of Intellectual Property Management, 11*(1), 63–80.

Garanina, T., Ranta, M., & Dumay, J. (2021). Blockchain in accounting research: Current trends and emerging topics. *Accounting, Auditing and Accountability Journal, 35*(7).

Gaur, N. (2020). Blockchain challenges in adoption. *Managerial Finance, 46*(6), 849–858.

Gauthier, M. P., & Brender, N. (2021). How do the current auditing standards fit the emergent use of blockchain? *Managerial Auditing Journal, 36*(3), 365–385. https://doi.org/10.1108/MAJ-12-2019-2513

González-Díaz, B., & García-Fernández, R. (2018). *Auditing*. Springer. https://doi.org/10.1007/978-3-319-20928-9_2362

Green, A., Kavanagh-Wright, L., & Lee, R. (2020). Investigation of the long-term yield of auditing for conformity with the ISO 15189:2012 quality standard in a hospital pathology laboratory. *Practical Laboratory Medicine, 20*, Article e00159. https://doi.org/10.1016/j.plabm.2020.e00159.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, *18*(1), 59–82. https://doi.org/10.1177/1525822X05279903

Gustafsson, J. (2017). Single case studies vs. multiple case studies: A comparative study. https://www.diva-portal.org/smash/get/diva2:1064378/FULLTEXT01.pdf

Hammer, D., & Wildavsky, A. (2018). The open-ended, semistructured interview: An (almost) operational guide. In *Craftways* (pp. 57–101). Routledge.

Hari, A., & Lakshman, T. V. (2016). The internet blockchain: A distributed, tamper-resistant transaction framework for the internet. Association for Computing Machinery. https://doi.org/10.1145/3005745.3005771

Harris, D. E., Holyfield, L., Jones, L., Ellis, R., & Neal, J. (2019). Research methods. In *Spiritually and Developmentally Mature Leadership* (pp. 57–65). Springer.

Hatfield, H. (1927). What is the matter with accounting? *Journal of Accountancy*, *44*(4). https://egrove.olemiss.edu/jofa/vol44/iss4/3

Hendriksen, E. (1991). *Accounting theory*. Richard d Irwin.

Hickman, M. (2017). The disadvantages of computer-assisted audit techniques. https://bizfluent.com/info-8630735-disadvantages-computerassisted-audit-techniques.html

Hojckova, K., Ahlborg, H., Morrison, G., & Sandén, B. (2020). Entrepreneurial use of context for technological system creation and expansion: The case of blockchain-based peer-to-peer electricity trading. *Research Policy, 49*(8), Article 104046. https://doi.org/10.1016/j.respol.2020.104046

Hughes, A., Park, A., Kietzmann, J., & Archer-Brown, C. (2019). Beyond bitcoin: What blockchain and distributed ledger technologies mean for firms. *Business Horizons, 62*(3), 273–281. https://doi.org/10.1016/j.bushor.2019.01.002

Hut-Mossel, L., Ahaus, K., Welker, G., & Gans, R. (2021). Understanding how and why audits work in improving the quality of hospital care: A systematic realist review. *PLoS ONE, 16*(3), Article e0248677. https://doi.org/10.1371/journal.pone.0248677

Iansiti, M., & Lakhani, K. R. (2017). The truth about blockchain. *Harvard Business Review, 95*(1), 3–11.

IMS. (2018). Blockchain to trigger a revolution in auditing and quality assurance. https://www.proschoolonline.com/blog/blockchain-to-trigger-a-revolution-in-auditing-and-quality-assurance/

International Auditing and Assurance Standards Board. (2020). *Handbook of international quality control, auditing, review, other assurance, and related services pronouncements*. https://www.ifac.org/system/files/publications/files/IAASB-2020-Handbook-Volume-1.pdf

Justinia, T. (2019). Blockchain technologies: Opportunities for solving real-world problems in healthcare and biomedical sciences. *Acta Informatica Medica, 27*(4), 284–291. https://doi.org/10.5455/aim.2019.27.284-291

Kahyaoglu, S. (n.d.). An analysis on the implementation of new approaches and techniques in the auditing of business processes based on blockchain technologies. Peter Lang.

Kamath, R. (2018). Food traceability on blockchain: Walmart's pork and mango pilots with IBM. *The Journal of the British Blockchain Association, 1*(1), 1–12. https://doi.org/10.31585/jbba-1-1-(10)2018

Kamble, S. S., Gunasekaran, A., & Sharma, R. (2020). Modeling the blockchain enabled traceability in agriculture supply chain. *International Journal of Information Management, 52*, Article 101967. https://doi.org/10.1016/j.ijinfomgt.2019.05.023

Kamen, D. (2018). Decentralized communication powered by blockchain. Skrumble Network. http://skrumble.network/wp-content/uploads/2018/02/WhitePaper_0207_v2-min-1.pdf

Karajovic, M., Kim, H. M., & Laskowski, M. (2019). Thinking outside the block: Projected phases of blockchain integration in the accounting industry. *Australian Accounting Review, 29*(2), 319–330. https://doi.org/10.1111/auar.12280

Kend, M., & Nguyen, L. A. (2020). Big data analytics and other emerging technologies: The impact on the Australian audit and assurance profession. *Australian Accounting Review, 30*(4), 269–282. https://doi.org/10.1111/auar.12305

Kim, T. G., Lee, J. H., & Law, R. (2018). An empirical examination of the acceptance behaviour of hotel front office systems: An extended technology acceptance model. *Tourism Management, 29*(3), 500–513. https://doi.org/10.1016/j.tourman.2007.05.016

Klaic, M., & Galea, M. P. (2020). Using the technology acceptance model to identify factors that predict likelihood to adopt tele-neurorehabilitation. *Frontiers in Neurology, 11*, Article 580832. https://doi.org/10.3389/fneur.2020.580832

Knechel, W. R., Thomas, E., & Driskill, M. (2020). Understanding financial auditing from a service perspective. *Accounting, Organizations and Society, 81*, Article 101080. https://doi.org/10.1016/j.aos.2019.101080

Kokina, J., Mancha, R., & Pachamanova, D. (2017). Blockchain: Emergent industry adoption and implications for accounting. *Journal of Emerging Technologies in Accounting, 14*(2), 91–100. https://doi.org/10.2308/jeta-51911

Kouhizadeh, M., Saberi, S., & Sarkis, J. (2021). Blockchain technology and the sustainable supply chain: Theoretically exploring adoption barriers. *International Journal of Production Economics, 231*, Article 107831. https://doi.org/10.1016/j.ijpe.2020.107831

Krysik, J. L., & Flynn, J. (2013). *Research for effective social work practice* (3rd ed.). Routledge. https://doi.org/10.4324/9780203077894

Kwok, A. O., & Koh, S. G. (2019). Is blockchain technology a watershed for tourism development? *Current Issues in Tourism, 22*(20), 2447–2452. https://doi.org/10.1080/13683500.2018.1513460

Lamboglia, R., Lavorato, D., Scornavacca, E., & Za, S. (2021). Exploring the relationship between audit and technology: A bibliometric analysis. *Meditari Accountancy Research, 29*(5), 1233–1260. https://doi.org/10.1108/MEDAR-03-2020-0836

La Torre, M., Sabelfeld, S., Blomkvist, M., Tarquinio, L., & Dumay, J. (2018). Harmonising non-financial reporting regulation in Europe: Practical forces and projections for future research. *Meditari Accountancy Research*, *26*(4), 598–621. https://doi.org/10.1108/MEDAR-02-2018-0290

Lev, B., & Gu, F. (2016). *The end of accounting and the path forward for investors and managers*. John Wiley and Sons.

Levy, H. (2020). History of the auditing world, part 1. *The CPA Journal*. https://www.cpajournal.com/2020/11/25/history-of-the-auditing-world-part-1/

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE.

Lindsay, J., Doutt, A., & Ide, C. (2019, July 8). Emerging technologies, risk, and the auditor's focus. *Harvard Law School Forum on Corporate Governance*. https://corpgov.law.harvard.edu/2019/07/08/emerging-technologies-risk-and-the-auditors-focus/

Liu, M., Wu, K., & Xu, J. (2019). How will blockchain technology impact auditing and accounting: Permissionless vs. permissioned blockchain. *Current Issues in Auditing, 13*(2), A19-A29. https://doi.org/10.2308/ciia-52540

Ljunggren, N. (2019). Improving the usability of secure information storing within blockchain applications [Master's thesis, Lund University]. https://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=8972293&fileOId=8972300

Maguire, M., & Delahunt, B. (2017). Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *All Ireland Journal of Higher Education*, *9*(3). https://doi.org/10.62707/aishej.v9i3.335

Malatji, R. W., Eck, V. R., & Zuva, T. (2020). Understanding the usage, modifications, limitations and criticisms of technology acceptance model (TAM). *Advances in Science, Technology and Engineering Systems Journal, 5*(6), 113–117. https://doi.org/10.25046/aj050612

Mancini, D., Lombardi, R., & Tavana, M. (2021). Four research pathways for understanding the role of smart technologies in accounting. *Meditari Accountancy Research, 29*(5), 1041–1062. https://doi.org/10.1108/medar-03-2021-1258

Manis, K. T., & Choi, D. (2019). The virtual reality hardware acceptance model (VR-HAM): Extending and individuating the technology acceptance model (TAM) for virtual reality hardware. *Journal of Business Research, 100*, 503–513. https://doi.org/10.1016/j.jbusres.2018.10.021

Marrone, M., & Hazelton, J. (2019). The disruptive and transformative potential of new technologies for accounting, accountants and accountability: A review of current literature and call for further research. *Meditari Accountancy Research*, *27*(5), 677-694. https://doi.org/10.1108/medar-06-2019-0508

Maxwell, J. A. (2017). *Qualitative research design: An interactive approach*. Sage.

McAliney, P., & Ang, B. (2019). Blockchain: Business' next new 'it' technology – A comparison of blockchain, relational databases, and google sheets. *International Journal of Disclosure and Governance, 16*(4), 163–173. https://doi.org/10.1057/s41310-019-00064-y

McCallig, J., Robb, A., & Rohde, F. (2019). Establishing the representational faithfulness of financial accounting information using multiparty security, network analysis and a blockchain. *International Journal of Accounting Information Systems, 33*, 47–58. https://doi.org/10.1016/j.accinf.2019.03.004

McGuigan, N., & Ghio, A. (2019). Art, accounting and technology: Unravelling the paradoxical in-between. *Meditari Accountancy Research, 27*(5), 789–804. https://doi.org/10.1108/medar-04-2019-0474

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), Article 100833. https://doi.org/10.1016/j.bar.2019.04.002

Mumford, D., Sampson, M., & Shires, J. (2024). The promises and pitfalls of cryptocurrencies and blockchain for marginalized communities. *Information, Communication & Society, 1*–18. https://doi.org/10.1080/1369118X.2024.2391817

Napley, K. (2019). Technology in the accountancy and legal sectors – what are the regulators doing? The long read...Lexology. https://www.lexology.com/library/detail.aspx?g=d5b232d8-cc2c-4068-a167-9e500e9b1691

Nathalie, B., Marion, G., Jean, M., & Aber, S. (n.d.). The potential impact of blockchain technology on audit practice. https://scholarspace.manoa.hawaii.edu/server/api/core/bitstreams/a0f69fd5-6de7-4307-bb9a-a6f6f65729c4/content

National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. (1979). *The Belmont Report: Ethical principles and guidelines for the protection of human subjects of research*. U.S. Department of Health and Human Services. https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/index.html

Noor, K. B. M. (2008). Case study: A strategic research methodology. *American Journal of Applied Sciences*, *5*(11), 1602–1604. https://doi.org/10.3844/ajassp.2008.1602.1604

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods, 16*, 1–13. https://doi.org/10.1177/1609406917733847

Organization for Economic Co-operation and Development. (2018). *Blockchain technology and corporate governance*. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/CA/CG/RD(2018)1/REV1&docLanguage=En

Palmrose, V., & Scholz, S. (2004). The circumstances and legal consequences of non-GAAP reporting: Evidence from restatements. *Contemporary Accounting Research, 21*(1), 139–180. https://doi.org/10.1506/wbf9-y69x-l4dx-jmv1

Park, J., & Park, M. (2016). Qualitative versus quantitative research methods: Discovery or justification?. *Journal of Marketing Thought, 3*(1), 1–8.

Parmoodeh, A., Ndiweni, E., & Barghathi, Y. (2022). An exploratory study of the perceptions of auditors on the impact on Blockchain technology in the United Arab Emirates. *International Journal of Auditing, 26*(3), 395–409. https://doi.org/10.1111/ijau.12299

Patel, K. J., & Patel, H. J. (2018). Adoption of internet banking services in Gujarat: An extension of TAM with perceived security and social influence. *International Journal of Bank Marketing, 36*(1), 147–169. https://doi.org/10.1108/IJBM-08-2016-0104

Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Sage Publications.

Pimentel, E., Boulianne, E., Eskandari, S., & Clark, J. (2021). Systemizing the challenges of auditing blockchain-based assets. *Journal of Information Systems, 35*(2), 61–75. https://doi.org/10.2308/isys-19-007

Public Company Accounting Oversight Board. (n.d.). *Driving improvement in audit quality to protect investors*. Public Company Accounting Oversight Board. https://pcaobus.org

Public Company Accounting Oversight Board. (2017). *Technology and the audit of today and tomorrow*. https://pcaobus.org/news-events/speeches/speech-detail/technology-and-the-audit-of-today-and-tomorrow_644

Rangarajan, L. N. (Ed.). (1992). *The arthashastra*. Penguin Books India.

Rapoport, M. (2018, March 15). PwC has an answer for the blockchain: Audit it. *The Wall Street Journal*. https://www.wsj.com/articles/pwc-has-an-answer-for-the-blockchain-audit-it-1521194401

Regueiro, C., Seco, I., Gutiérrez-Agüero, I., Urquizu, B., & Mansell, J. (2021). Blockchain-based audit trail mechanism: Design and implementation. *Algorithms, 14*(12), Article 341. https://doi.org/10.3390/a14120341

Resnik, D. B. (2018). *The ethics of research with human subjects: Protecting people, advancing science, promoting trust*. Springer.

Rikken, O., Janssen, M., & Kwee, Z. (2019). Governance challenges of blockchain and decentralized autonomous organizations. *Information Polity, 24*(4), 397–417. https://doi.org/10.3233/ip-190154

Rohtak. (2004). *Accounting theory*. http://www.mdudde.net/books/mcom/mcom-f/accounting%20theory-final.pdf

Roszkowska, P. (2021). Fintech in financial reporting and audit for fraud prevention and safeguarding equity investments. *Journal of Accounting & Organizational Change, 17*(2), 164–196.

Rozario, A., & Vasarhelyi, M. A. (2018). Auditing with smart contracts. *International Journal of Digital Accounting Research, 18*, 1–27. https://doi.org/10.4192/1577-8517-v18_1

Rozario, A. M., & Thomas, C. (2019a). Reengineering the audit with blockchain and smart contracts. *Journal of Emerging Technologies in Accounting, 16*(1), 21–35. https://doi.org/10.2308/jeta-52432

Rozario, A. M., & Thomas, C. (2019b). We are reengineering the audit with blockchain and smart contracts. *Journal of Emerging Technologies in Accounting, 16*(1), 21–35. https://doi.org/10.2308/jeta-52432

Saheb, T., & Mamaghani, F. H. (2021). Exploring the barriers and organizational values of blockchain adoption in the banking industry. *The Journal of High Technology Management Research, 32*(2), Article 100417. https://doi.org/10.1016/j.hitech.2021.100417

Schmitz, J., & Leoni, G. (2019). Accounting and auditing at the time of Blockchain technology: A research agenda. *Australian Accounting Review*, *29*(2), 331–342. https://doi.org/10.1111/auar.12286

Scott, W. R. (2015). *Financial accounting theory*. Pearson.

Secinaro, S., Dal Mas, F., Brescia, V., & Calandra, D. (2021). Blockchain in the accounting, auditing and accountability fields: A bibliometric and coding analysis. *Accounting, Auditing & Accountability Journal, 34*(5), 1092–1132. https://doi.org/10.1108/AAAJ-10-2020-4987

Serpeninova, Y., Makarenko, S., & Litvinova, M. (2019). Computer-assisted audit techniques: Main advantages and disadvantages. *Bulletin of Sumy State University, 3*, 138–144. https://core.ac.uk/download/pdf/324211541.pdf

Sharma, G. (2017). Pros and cons of different sampling techniques. *International Journal of Applied Research, 3*(7), 749–752.

Sheldon, M. D. (2018). Using blockchain to aggregate and share misconduct issues across the accounting profession. *Current Issues in Auditing, 12*(2), 27–35. https://doi.org/10.2308/ciia-52184

Smith, S. S. (2017). Sustainability: How accountants can add value and deliver results. *Management Accounting Quarterly, 19*(1), 19–30.

Sterling, R. R. (1967). Conservatism: The fundamental principle of valuation in traditional accounting. *Abacus*, *3*(2), 109–132. https://doi.org/10.1111/j.1467-6281.1967.tb00375.x

Stratopoulos, T., & Wang, V. (2019). *Blockchain technology adoption*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3188470

Tai, M. C. T. (2012). Deception and informed consent in social, behavioral, and educational research (SBER). *Tzu Chi Medical Journal, 24*(4), 218–222. https://doi.org/10.1016/j.tcmj.2012.05.003

Theofanidis, D., & Fountouki, A. (2018). Limitations and delimitations in the research process. *Perioperative Nursing, Quarterly Scientific, Online Official Journal of GORNA, 7*(3), 155–163. https://www.spnj.gr/en/limitations-and-delimitations-in-the-research-process-p160.html

Thottoli, M. M., Thomas, K. V., & Ahmed, E. R. (2019). Qualitative analysis on information communication technology and auditing practices of accounting professionals. *Journal of Information and Computational Science, 9*(9), 529–537. https://doi.org/10.5373/jardcs/v11sp12/20193242

Tiron-Tudor, A., Deliu, D., Farcane, N., & Cristescu, M. P. (2021a). Navigating the new auditing ecosystem: Opportunities and challenges of blockchain adoption. *Sustainability, 13*(22), Article 12500.

Tiron-Tudor, A., Deliu, D., Farcane, N., & Dontu, A. (2021b). Managing change with and through blockchain in accountancy organizations: A systematic literature review. *Journal of Organizational Change Management, 34*(2), 477−506. https://doi.org/10.1108/jocm-10-2020-0302

Tobi, H., & Kampen, J. K. (2018). Research design: The methodology for interdisciplinary research framework. *Quality & Quantity: International Journal of Methodology*, *52*(3), 1209–1225. https://doi.org/10.1007/s11135-017-0513-8

Toufaily, E., Zalan, T., & Dhaou, S. B. (2021). A framework of blockchain technology adoption: An investigation of challenges and expected value. *Information & Management*, *58*(3), 103444. https://doi.org/10.1016/j.im.2021.103444

Tripathi, G., Ahad, M. A., & Casalino, G. (2023). A comprehensive review of blockchain technology: Underlying principles and historical background with future challenges. *Decision Analytics Journal, 9*, 100344. https://doi.org/10.1016/j.dajour.2023.100344

Uwizeyemungu, S., Bertrand, J., & Poba-Nzaou, P. (2020). Patterns underlying required competencies for CPA professionals: A content and cluster analysis of job ads. *Accounting Education, 29*(2), 109–136.

Vincent, N. E., Skjellum, A., & Medury, S. (2020). Blockchain architecture: A design that helps CPA firms leverage the technology. *International Journal of Accounting Information Systems, 38*, Article 100466. https://doi.org/10.1016/j.accinf.2020.100466

Wang, Y., & Kogan, A. (2018). Designing confidentiality-preserving Blockchain-based transaction processing systems. *International Journal of Accounting Information Systems*, *30*, 1–18. https://doi.org/10.1016/j.accinf.2018.06.001

Wang, Y., Li, J., Yan, Y., Chen, X., Yu, F., Zhao, S., Yu, T., & Feng, K. (2021). A semi-centralized blockchain system with multi-chain for auditing communications of Wide Area Protection System. *PLoS ONE, 16*(1), Article e0245560. https://doi.org/10.1371/journal.pone.0245560

White, B. S., King, C. G., & Holladay, J. (2020). Blockchain security risk assessment and the auditor. *Journal of Corporate Accounting & Finance, 31*(2), 47–53. https://doi.org/10.1002/jcaf.22433

Whittington, G. (2007). Financial accounting theory: An overview. In G. Whittington (Ed.), *Profitability, accounting theory and methodology: The selected essays of Geoffrey Whittington* (pp. 367–420). Routledge.

Wolk, H., Dodd, J., & Rozycki, J. (2017). *Accounting theory: A conceptual and institutional approach* (9th ed.). SAGE Publications.

Yadav, V. S., Singh, A. R., Raut, R. D., & Govindarajan, U. H. (2020). Blockchain technology adoption barriers in the Indian agricultural supply chain: An integrated approach. *Resources, Conservation and Recycling, 161*, Article 104877. https://doi.org/10.1016/j.resconrec.2020.104877

Yermack, D. (2017). Corporate governance and blockchains. *Review of Finance, 21*(1), 7–31. https://doi.org/10.1093/rof/rfw074

Yin, R. K. (2009). How to do better case studies. In L. Bickman & D. J. Rog (Eds.), *The SAGE handbook of applied social research methods* (2nd ed., pp. 254–282). SAGE Publications.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE.

Yu, T., Lin, Z., & Tang, Q. (2018). Blockchain: The introduction and its application in financial accounting. *Journal of Corporate Accounting and Finance, 29*(4), 37–47. https://doi.org/10.1002/jcaf.22365

Zheng, J., & Li, S. (2020). What drives students' intention to use tablet computers: An extended technology acceptance model. *International Journal of Educational Research, 102*, Article 101612. https://doi.org/10.1016/j.ijer.2020.101612

Zheng, Z., Xie, S., Dai, H., Chen, X., & Wang, H. (2018). Blockchain challenges and opportunities: A survey. *International Journal of Web and Grid Services, 14*(4), 352–375. https://doi.org/10.1504/ijwgs.2018.095647