Blockchain and CPAs: Assessing Preparedness in a Technologically Evolving Profession

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Blockchain technology is reshaping industries with its emphasis on transparency, security, and decentralization. As this technology becomes integrated into business operations, Certified Public Accountants (CPAs) face new challenges in adapting their practices to meet the clients' needs using blockchain. This research examines the preparedness of CPAs assessing their knowledge, skills, and competencies related to blockchain technology. Utilizing interviews, the study provides a comprehensive evaluation of how well CPAs are equipped to handle the complexities of blockchain. The findings highlight significant gaps in blockchain education and training within the accounting profession, indicating needs for targeted professional development initiatives. The study identifies critical areas where CPAs need support and offers actionable recommendations to enhance their readiness in an evolving technological landscape. Addressing these gaps will better position the accounting profession to meet demands of the future where blockchain technology plays a central role in financial reporting, auditing, and compliance.

Keywords: blockchain, crypto assets, cryptocurrencies, small CPA firms

INTRODUCTION

Blockchain technology has emerged as one of the most disruptive innovations in recent years. Its adoption in numerous applications, from cryptocurrency transactions to smart contracts and beyond significantly transformed various industries (A. N. Didenko, 2022; B. Mansfield, 2021; Renduchintala et al., 2022; C. Sheedy, 2023; K. Smith, 2019; R. Van Hoek, 2020 R. Williamson, 2022). For the accounting profession, blockchain presents both a challenge and an opportunity (Popovic et al., 2020; P. Ramin, 2019). Certified Public Accountants (CPAs), who have long been the gatekeepers of financial accuracy and integrity, are now faced with a rapidly evolving technological landscape (S. S. Smith, 2018). The adoption of blockchain technology by businesses requires CPAs to not only understand the technical aspects of blockchain, but also integrate these new processes into their existing frameworks for auditing, financial reporting and advisory services. However, small CPA firms may be at a disadvantage due to their limited resources and expertise (CPA Australia, 2022; CPA.com, 2022; Kokina et al., 2017; Schmitz & Leoni, 2019; Zhang et al., 2020)). While larger firms have the capacity to invest in training, tools, and new service lines, smaller firms often struggle to keep pace with technological advancements (Jayasuriya & Sims, 2023). This discrepancy could widen the gap between large and small firms, constraining the latter's ability

to compete and expand (Han et al., 2023). However, with small CPA firms outnumbering large firms at the 91 to 1 ratio in 2018 (E. Mendlovitz, 2018) blockchain technologies can provide a tremendous opportunity for small firms' growth, particularly in advising clients on blockchain implementation and integration (CPA Australia & Singapore Management University School of Accountancy, 2021; Iansiti & Lakhani, 2017; Tapscott & Tapscott, 2016; D. Yermack, 2017).

This study explores the perspectives of accounting professionals in small CPA firms regarding the resources they currently have and those they need to successfully support blockchain adoption among their clients, ultimately expanding their firms' service offerings and revenue streams. The integration of blockchain technology into business operations is rapidly increasing, leading to a growing demand for specialized accounting services (B. Mansfield, 2021). Through gathering insights from accounting professionals within these firms, this study aims to pinpoint the existing resources available to them and the additional tools and knowledge needed to enhance their ability to serve blockchain clients.

Blockchain Technology and Its Impact on Accounting

The distinct features of blockchain technology, such as immutability, secure transactions, automated smart contracts and decentralized platforms, have established it as a disruptive force in the accounting industry (Dai & Vasarhelyi, 2017; Tapscott & Tapscott, 2016; D. Yermack, 2017). Such technology offers significant benefits, including risk mitigation, improved compliance, cost-effective payments, and enhanced transparency (Bonsón & Bednárová, 2019; CPA Australia & Singapore Management University School of Accountancy, 2021). These attributes are in line with the traditional responsibilities of accountants, who ensure the accuracy and reliability of financial information (Kokina et al., 2017; Schmitz & Leoni, 2019; M. Swan, 2015). Moreover, the blockchain is defined as an accounting technology facilitating recordkeeping (Abdennadher et al., 2022; CPA Canada & AICPA, 2017; Institute of Chartered Accountants in England and Wales, 2017).This technological shift represents a significant departure from traditional accounting practices, requiring CPAs to develop a deep understanding of blockchain's underlying mechanics and its implications for financial reporting and auditing (Dai & Vasarhelyi, 2017; M. Swan, 2015; Zhang et al., 2020). Furthermore, as blockchain technology becomes more widespread, CPAs must be prepared to address the ethical and regulatory challenges that come with its adoption, including issues related to data security, confidentiality and the integrity of financial information (P. D. DeVries, 2016; M. Giancaspro, 2017; B. Mansfield, 2021; Nguyen et al., 2023).

Frameworks for Blockchain Adoption in Accounting

Numerous frameworks have been suggested to facilitate the integration of blockchain technology into accounting systems. Jayasuriya and Sims (2023) introduced the Decentralized Accounting and Enterprise Resource Planning System (DAERPS) and the Decentralized Accounting Information System (DAIS) frameworks. These frameworks are intended to offer a systematic approach to implementing blockchain technology within existing accounting systems, overseeing decentralized ledgers and managing smart contracts. The DAIS framework places particular emphasis on aligning blockchain adoption with professional standards, regulatory requirements and ethical considerations. The conceptual framework highlights the importance of comprehending the governance and operational characteristics of blockchain as well as the potential challenges and limitations. Building on this groundwork, the extended DAERPS framework incorporates aspects of enterprise resource planning, risk management and data management providing a comprehensive approach to blockchain adoption in accounting. Additionally, the Unified Theory of Acceptance and Use of Technology (UTAUT) model has been utilized to examine blockchain adoption in the accounting profession (Abu Afifa et al., 2023; Bouteraa et al., 2023; Ferri et al., 2021; R. K. Jena, 2022; Liang et al., 2021). This model delves into the factors influencing accountants' inclination to embrace new technologies, such as perceived usefulness, ease of use and the alignment of technology with organizational goals (Kasztelnik & Jermakowicz, 2024). Studies using the UTAUT model have found that accountants are generally receptive to blockchain technology provided it is germane to their work and easily integrable into existing systems. Nonetheless, these studies also underscore the necessity for more targeted training and education to ensure that CPAs can fully exploit blockchain's potential.

Ethical and Regulatory Considerations

The integration of blockchain technology in accounting has triggered notable ethical and regulatory considerations related to professional competence, due care and confidentiality (P. D. DeVries, 2016; M. Giancaspro, 2017; Nguyen et al., 2023; M. Swan, 2015). The potential for improved transparency and traceability in financial transactions with blockchain necessitates meticulous maintenance of data accuracy and integrity (CPA Australia & Singapore Management University School of Accountancy, 2021; Dai & Vasarhelyi, 2017; M. Swan, 2015; Tapscott & Tapscott, 2016). Given that all transactions are recorded on a public ledger accessible to all network participants the decentralized nature of blockchain presents challenges to conventional confidentiality norms (Iansiti & Lakhani, 2017; Kokina et al., 2017; Schmitz & Leoni, 2019; D. Yermack, 2017). Collaboration inherent to blockchain environment impacts inter-organizational relationships and requires reconsideration of internal controls environment (Kostić & Sedej, 2022). Moreover, the regulatory landscape for blockchain technology is still evolving, with varying governance approaches adopted in different jurisdictions (P. D. DeVries, 2016; M. Giancaspro, 2017; B. Mansfield, 2021; Zhang et al., 2020). CPAs are expected to keep abreast of these developments to offer compliant and timely advice to their clients (M. Giancaspro, 2017; Kokina et al., 2017; Schmitz & Leoni, 2019). This is especially pertinent for small CPA firms that may lack access to resources and expertise larger firms have, impacting ability to offer informed advice (Bonsón & Bednárová, 2019; B. Mansfield, 2021; Kokina et al., 2017; Zhang et al., 2020). To tackle these challenges, professional bodies like the American Institute of CPAs (AICPA), CPA Australia, CPA Canada, the Committee of Sponsoring Organizations of the Treadway Commission, and World Economic Forum, among others, have developed resources and training programs to enhance CPAs' understanding of blockchain technology (Burns et al., 2020; CPA Australia & Singapore Management University School of Accountancy, 2021; CPA Canada, 2024; Jayasuriya & Sims, 2023; Tapscott & Tapscott, 2016; World Economic Forum, 2020). These initiatives help CPAs navigate the ethical and regulatory complexities of blockchain and equip them with the necessary tools and knowledge to serve clients effectively (M. Giancaspro, 2017; Schmitz & Leoni, 2019; M. Swan, 2015).

The escalating adoption of blockchain technology represents a significant shift in the business landscape, offering both challenges and opportunities for accounting professionals (Dominguez Anguiano & Parte, 2023; Han et al., 2023; Popovic et al., 2020). Small CPA firms find themselves at a pivotal juncture, where integrating blockchain technology into client operations could serve as a substantial avenue for expanding their service offerings and revenue streams (J. Adams, 2019). However, the successful adoption of this technology depends on the availability of adequate resources and the firms' ability to effectively utilize them (Popovic et al., 2020).

RESEARCH QUESTION

The research questions are designed to provide a comprehensive understanding of the challenges and opportunities faced by small CPA firms as they navigate the complexities of blockchain technology adoption. By examining the adequacy of existing resources and identifying additional tools or knowledge that may be required, this study seeks to uncover the factors that influence these firms' ability to effectively serve blockchain clients. The insights gained from this research will not only highlight the current state of preparedness among small CPA firms but also offer practical recommendations for enhancing their capacity to leverage blockchain technology as a means of growth and competitive advantage in the accounting profession.

PRIMARY RESEARCH QUESTION

RQ: What are the perspectives of accounting professionals in small CPA firms regarding the existing and needed resources to assist external clients in successfully adopting blockchain technology, a potential avenue for expanding CPA firms' revenue streams?

Subquestions

SQ1: *How do accounting professionals in small CPA firms perceive the adequacy of current resources available for supporting blockchain technology adoption among external clients?*

SQ2: *What additional resources or tools do accounting professionals in small CPA firms identify as necessary to enhance their capacity to serve blockchain clients and expand their firms' revenue streams?*

RESEARCH DESIGN

This research employs a rigorous qualitative research design to investigate the readiness of accounting professionals in small Certified Public Accounting (CPA) firms in the United States to support clients in adopting blockchain technology. The choice of a descriptive qualitative inquiry approach facilitates the exploration of detailed experiences and perceptions of the participants, essential for understanding the nuances of blockchain technology's impact on small CPA firms. Data collection was subject to IRB approval and involved conducting semi-structured interviews with 13 qualified accounting professionals from small CPA firms, each lasting between 45 and 60 minutes. The semi-structured interview format was chosen to allow flexibility enabling participants to freely express their thoughts while ensuring comprehensive coverage of key topics relevant to the research questions (Jameel et al., 2018). This method not only facilitated the collection of in-depth data but also allowed for exploration of cross-organizational processes and needs influenced by blockchain technology. The study's sampling strategy was meticulously designed to ensure the selected participants were representative of the target population. Participants were accounting professionals from small CPA firms with annual revenues not exceeding $26.5 million, aligned with the small CPA firm definition published by the Small Business Administration under the industry code NAICS 541211 (Small Business Size Regulations, 2023). The selection parameters ensured the relevance of experiences and business size to the research focus. The recruitment process was strategic, utilizing professional accounting associations and social media groups to ensure a diverse and qualified sample. Finally, the data collection instrument was developed following Kallio et al. (2016) five steps of the interview guide: the identification of the applicability of the technique, existing knowledge through the literature review and the development of the conceptual framework, the creation of an interview guide aligned with the research question and the framework, expert panel review and field test, as well as completion with the presentation of the artifact as the interview transcript.

The data analysis process entailed a manual thematic analysis, adhering to established qualitative research practices. The data analysis followed the four phases of the qualitative analysis described by J. Baptiste (2001) and the more specific six steps defined by Braun and Clarke (2006), deductive coding (Nowell et al., 2017), inductive coding (Fereday & Muir-Cochrane, 2006) enhanced with two level coding (Saldaña, 2015) and reflexivity (Braun et al., 2022). This approach enabled a detailed examination of the data, resulting in the identification of 34 codes, 12 categories, eight initial themes and four final themes enhanced with a sensitivity analysis. The thematic analysis provided a structured method to interpret the rich qualitative data, ensuring that the study’s findings are grounded in the participants’ actual experiences and insights (Braun & Clarke, 2006). The significance of this study lies in its capacity to provide a comprehensive understanding of the challenges and opportunities that small CPA firms face in the context of blockchain technology. By focusing on the perspectives of accounting professionals, the research contributes valuable knowledge that can inform the development of targeted resources and tools to enhance the capacity of small CPA firms to serve blockchain clients. The insights gained from this study have the potential to influence policy, practice and future research making it a crucial contribution to the field of accounting in a technologically evolving profession.

INTERPRETATIONS

Research Question Specific Insights

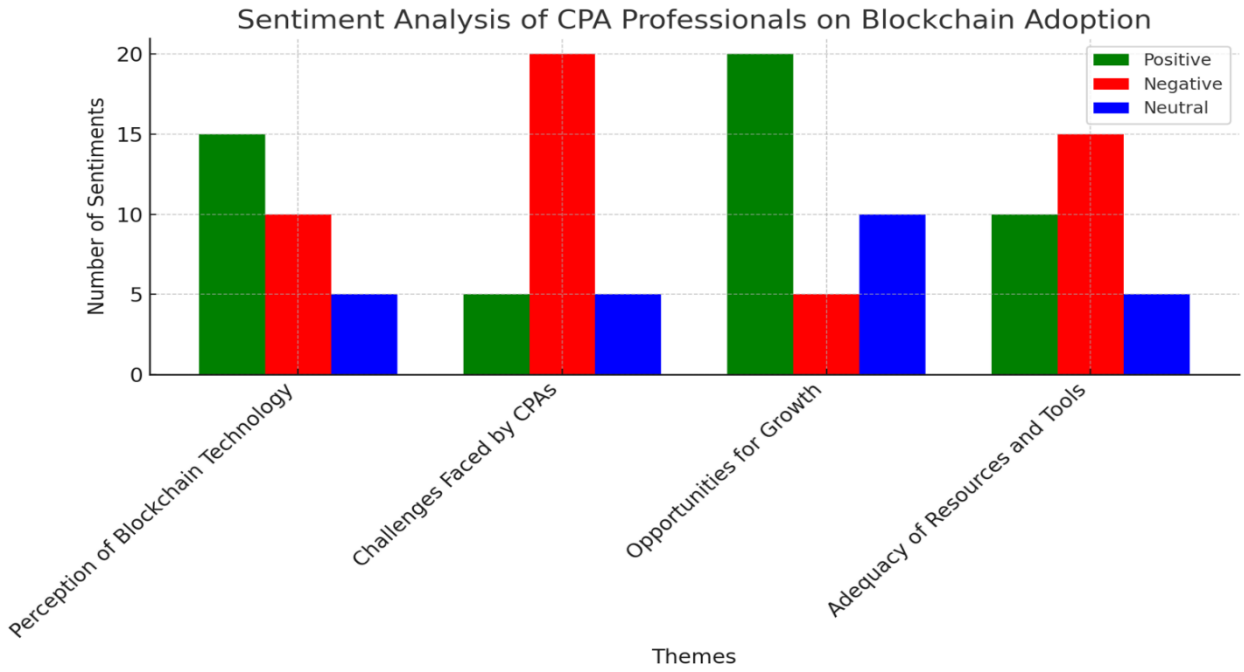
The primary research question results show that accounting professionals in small CPA firms see the potential of blockchain technology to enhance their services but express concerns about their preparedness to support clients in adopting the technology. While they are enthusiastic about the opportunities blockchain presents, they also acknowledge the challenges posed by its complexity and existing knowledge gaps. The subquestion 1 results further uncover that accounting professionals in small CPA firms feel that the current resources for supporting blockchain adoption are inadequate. They believe that there is a scarcity of specialized software, industry guidelines and training programs to fully prepare CPAs for managing blockchain transactions and providing strategic advisory services to clients. To mitigate the shortage, accountants create nonauthoritative resources and share experiences within targeted communities. Consistent are results from subquestion 2 identifying the need for significant enhancements in resources, tools and training to effectively support clients in this area and capitalize on the opportunities presented by blockchain technology. To better serve blockchain clients, accounting professionals in small CPA firms have identified critical needs:

1. Advanced Blockchain Accounting Software: Seamless integration with traditional accounting systems, sub-ledger management and automation of complex blockchain transactions.
2. Comprehensive Training: Education programs providing in-depth knowledge of blockchain technology and its implications for accounting.
3. Updated Professional Standards and Guidelines: Updated standards and comprehensive guidelines addressing blockchain accounting nuances.
4. Enhanced Security and Compliance Tools: Tools to manage cybersecurity threats, ensure transaction integrity and comply with regulations.

Sentiment Analysis

To enhance the insights, we present a comprehensive sentiment analysis of the perspectives and experiences shared by accounting professionals from small CPA firms. The analysis facilitates the identification of prevailing attitudes, emotions and perceptions regarding the adoption of blockchain technology within the accounting profession. Subsequently, we discuss findings supported by graphical representations to illustrate the sentiment distribution across four themes. The sentiment analysis was conducted using a qualitative approach, involving manual coding of the interview transcripts to categorize sentiments as positive, negative or neutral. The coding focused on key themes such as the perception of blockchain technology, challenges faced by CPAs, opportunities for growth and the adequacy of resources and tools available for blockchain adoption. The results were then visualized to highlight the overall sentiment distribution among the participants.

FIGURE 1
SENTIMENT ANALYSIS OF CPA PROFESSIONALS ON BLOCKCHAIN ADOPTION



Source: Compiled by Authors

The sentiment analysis graph above depicts the distribution of positive, negative and neutral sentiments across four key themes identified in interviews with accounting professionals from small CPA firms. Each theme represents a crucial area of concern or opportunity related to the adoption of blockchain technology within the accounting profession. The subsequent sections will offer a comprehensive analysis of these themes, utilizing the sentiment data to discuss the implications for CPAs and their readiness to serve blockchain clients.

Theme 1: Perception of Blockchain Technology. Participants generally feel positive sentiment about blockchain technology in accounting. CPAs expressed alignment with important accounting principles like transparency and real-time transaction recording. Blockchain can make accounting easier, reduce mistakes and make financial reporting more trustworthy. Participants who feel negative about blockchain say that it is hard to learn and there are no set rules. This shows that there is a need for specific education and training to help CPAs use blockchain technology in their work.

Theme 2: Challenges Faced by CPAs. The analysis reveals that many CPAs face challenges in adopting blockchain technology, which leads to negative sentiments. These challenges include the complexity of blockchain systems, the scarcity of specialized knowledge and skills as well as the perception that current professional standards are inadequate for blockchain accounting intricacies. Participants also mentioned difficulties in integrating blockchain into existing accounting frameworks, especially those regarding multi-jurisdictional compliance, asset custody and transaction verification. The lack of comprehensive industry guidelines exacerbates these challenges, causing uncertainty and hesitancy among CPAs. Despite these obstacles, some participants see an opportunity to position their firms as leaders in the niche market by offering specialized blockchain advisory services.

Theme 3: Opportunities for Growth. The sentiment analysis shows a positive outlook on blockchain-related services growth potential. Participants see opportunities in blockchain consulting, digital asset management and advisory services related to smart contracts and DeFi. However, some express caution due to potential risks like regulatory changes and market volatility. This underlines the need for CPAs to stay well-informed and agile in navigating the evolving blockchain landscape.

Theme 4: Adequacy of Resources and Tools. Opinions on the resources and tools for blockchain adoption varied. While some participants acknowledged the availability of basic tools and educational resources, there was a consensus that these are insufficient for the complexities of blockchain accounting. Some expressed frustrations with the lack of comprehensive industry-specific tools, while others noted positive outcomes from using specialized software or developing in-house solutions. These participants highlighted the importance of collaboration and knowledge-sharing within the CPA community.

The sentiment analysis of data from small CPA firms shows recognition of the potential of blockchain technology, but significant challenges remain. CPAs are optimistic about the opportunities blockchain presents for growth and service diversification, but they must address gaps in knowledge, resources and regulatory guidance. This underscores the importance of ongoing research, education, and collaboration within the accounting profession to prepare them for the challenges and opportunities presented by blockchain technology. Future studies should focus on developing standardized frameworks and tools to support the widespread adoption of blockchain in accounting practices.

Tools and Enhancements Recommendations

The study identified key challenges for small CPA firms in adopting blockchain technology including: the complexity of blockchain systems, scarcity of specialized knowledge and skills, inadequacy of current professional standards, integration with existing accounting frameworks, regulatory uncertainty, risk of fraud and scams, manual processes and lack of adequate tools, and the complexities of handling fluid jurisdictions and global operations. Participants expressed the need for enhancement to specific tools, outlined in Table 1, enabling CPAs to effectively manage and leverage blockchain technology, thereby providing accurate, compliant and value-added services to their clients.

TABLE 1
ESSENTIAL BLOCKCHAIN TOOLS ENHANCEMENTS NEEDED BY CPAS

Tool	Enhancements
Crypto Accounting Software	- Sub-Ledgers: Seamless integration with ERP systems for accurate tracking and reporting of blockchain transactions. - Transaction Reconciliation Tools: Automatic reconciliation of blockchain transactions with traditional accounting records, particularly in multi-currency environments.
Blockchain Explorers	- Advanced Blockchain Explorers: Providing detailed insights into transactions with user-friendly interfaces and compatibility with various blockchain protocols.
Tax Reporting Software	- Crypto Tax Software: Specifically designed for generating tax reports based on blockchain transactions, including activities with tax implications. - Automated Tax Compliance Tools: Automation of the compliance process for accurate reporting according to the latest tax regulations.
Wallet Management Tools	- Custodial Solutions: Secure management of digital wallets and transaction tracking. - Wallet Hygiene Tools: Assistance in maintaining proper wallet hygiene, such as tracking wallet addresses and managing multiple wallets.
Data Aggregation and Analytics Tools:	- Blockchain Data Aggregators: Aggregation of data from multiple blockchains into a coherent view for analysis and reporting. - Analytics Platforms: Provision of advanced analytics for interpreting blockchain data and identifying trends.

Compliance and Regulatory Tools	- Regulatory Compliance Tools: Tracking of regulatory changes and ensuring compliance of blockchain transactions. - Governance Tools: Assistance in setting up and maintaining governance frameworks within blockchain environments.
Smart Contract Auditing Tools	- Smart Contract Analysis Tools: Auditing smart contracts for accuracy and identification of potential vulnerabilities.
Education and Training Platforms	- Blockchain Learning Resources: Offering courses, certifications, and up-to-date information on blockchain technology.
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Source: Compiled by Authors

SUMMARY OF KEY RESEARCH FINDINGS

Many CPAs view blockchain technology as a transformative force in accounting, offering enhanced transparency, security and efficiency. However, there is a significant gap in specialized knowledge and skills related to blockchain among CPAs, particularly in small firms. Integrating blockchain into existing accounting frameworks presents challenges including reconciling different transaction bases and managing decentralized systems. Current professional standards and guidelines are insufficient to address the unique aspects of blockchain accounting leading to uncertainty in reporting blockchain-related transactions. The evolving regulatory landscape for blockchain and digital assets creates significant uncertainty posing risks and complicating the adoption of blockchain technology. The decentralized nature of blockchain transactions increases the risk of fraud, posing challenges for ensuring transaction security.

There is a strong demand for more robust tools to support blockchain accounting as current tools are often inadequate, leading to manual processes that are time-consuming and error prone. Despite these challenges, blockchain presents opportunities for CPA firms to expand their service offerings, such as blockchain consulting and digital asset management. Given the novelty and complexity of blockchain, there is a strong emphasis on community collaboration and knowledge-sharing among CPAs. These findings highlight the dual nature of blockchain technology as both an opportunity and a challenge for the accounting profession, emphasizing the need to address knowledge, tools and regulatory gaps to fully leverage blockchain's benefits.

CONCLUSION

The study identified several promising growth areas in blockchain technology that offer significant opportunities for CPA firms, particularly those looking to expand their service offerings and revenue streams. These growth areas include blockchain consulting and advisory services, digital asset management, tax planning and compliance, blockchain auditing, decentralized finance (DeFi) advisory, tokenization of assets, supply chain management as well as environmental, social and governance (ESG) reporting. These areas represent significant opportunities for CPA firms to expand their service offerings and establish themselves as leaders in the emerging blockchain economy. Small CPA firms can benefit from blockchain technology in various strategic ways including offering specialized blockchain services such as advisory services, cryptocurrency accounting and smart contract auditing. They can also improve operational efficiency through internal process streamlining, automation with smart contracts, and enhancing data security. Furthermore, small firms can create niche market opportunities by targeting blockchain-based businesses and developing industry-specific solutions. Building strategic partnerships, educating clients, and expanding services are also viable strategies. Additionally, leveraging blockchain for transparency, ESG reporting and exploring new business models like tokenization of assets can further benefit small CPA firms.

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