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# From Ledgers to Blockchains: Accounting's Cool New Makeover

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***ABSTRACT***

*This paper dives into how blockchain might just shake up the old-school world of financial accounting, both now and in the future. Think about it: with blockchain, there's no need for that big central authority to oversee every little transaction or jot down every record. This could mean simpler, clearer accounting and less shady business. We're also looking into how decision-makers can blend blockchain into today's financial reporting system. But here's the kicker: even though blockchain could revolutionize accounting, it's not all sunshine and rainbows. There are bumps in the road, like getting everyone on the same page (standardization), managing its growth (scalability), and keeping things private. So, while blockchain has some major cool points, there are hurdles to jump before it goes mainstream in the accounting world.*

***KEYWORDS:*** *Ledgers; Blockchains; Accounting; Transformation; Decentralization; Financial transparency; Technology disruption; Modernization.*

## Introduction

Technological advances have persistently influenced numerous global sectors, including financial accounting. Despite the transformative impact of the internet on information transfer, its influence on value transfer remained less dramatic (Warburg, 2016). Enter blockchain technology (BT), initially developed for cryptocurrencies like Bitcoin. Its potential, however, extends beyond mere currency exchange. BT, or as it's technically known, distributed ledger technology (DLT), promises innovations in fields as diverse as supply chain management, healthcare, and prominently, financial accounting. The momentum of BT's significance is undeniable, gaining traction both in business and societal contexts. This traction is evident by the keen interest it garners from academic and industry circles alike. So, what's blockchain? Stanciu (2017) aptly describes it as "a distributed database of records, or a public ledger of all transactions or digital events executed and shared among involved parties." Interestingly, a transaction's acceptance into the ledger hinges on the consensus of over half the system's users. Once a transaction gains approval, it's etched in stone; it becomes indelible (Atlam et al., 2018). And here's a nuance: there isn't a single copy of this ledger. Multiple versions exist, each managed and authenticated by network members.

Now, for the process. Imagine a long chain, and each link is a set of transactions. Each new transaction gets added sequentially, following older, verified ones in 'blocks.' This addition isn't random. It involves what's termed a 'hash' or a cryptographic signature. In BT's structure, each block gets a number. This process essentially interlinks fresh transactions' information with older ones (Buterin, 2014). If BT's architecture sounds intricate, its true strength is surprisingly straightforward: decentralization. Instead of records piled in one place, they're spread across various nodes (Bonsón & Bednárová, 2019). And, anyone approved within this decentralized, peer-to-peer network can pull up these records. Plus, these aren't just any records. They're steadfast, unchanged, and shielded, somewhat resembling an online ledger (Buterin, 2014). BT offers a formidable blend of security, clarity, efficiency, and transaction management prowess. As it continually integrates into diverse sectors, financial accounting stands to be a prime beneficiary. Blockchain technology (BT), originally known for powering cryptocurrencies, has now firmly planted its

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roots in the accounting world. This tech marvel has changed the game for various accounting operations including transaction processing, voucher creation, inventory tracking, and contract management. Major accounting powerhouses, including Deloitte, Ernst & Young, PwC, and KPMG, are harnessing BT's capabilities to supercharge their service offerings.

Deloitte, a trailblazer in the blockchain domain, unveiled its "Rubix" platform back in 2014, aimed at providing blockchain-related consultation and applications. Not stopping there, the company set up dedicated blockchain labs in Dublin (2016) and New York (2017) to innovate and roll out solutions leveraging BT. Their dedication to integrating this technology was further highlighted when they joined forces with the Monetary Authority of Singapore in 2018 to explore blockchain's potential in syncing fund transfers with security transfers (Cheng & Huang, 2020). Catching the blockchain wave, Ernst & Young launched the EY Ops Chain. Simultaneously, KPMG embraced blockchain to design prototype models that streamline reconciliation and cross-referencing of financial data. This technology has been particularly beneficial for sectors like healthcare, finance, and the public domain. KPMG's models specialize in validating invoices, handling payment systems, managing inventory, and overseeing digital contracts. On a similar trajectory, PricewaterhouseCoopers (PWC) integrated the De Novo platform within the supply chain. BT's influence is evident across leading accounting firms, showing that the future of accounting might just be 'on the block(chain)'.

Blockchain technology (BT), with its decentralized, transparent, and unchangeable nature, has marked a new dawn for financial accounting. It offers tantalizing potential for revolutionizing traditional systems, but embracing this shift isn't without its hurdles. This study delves deep into both the promise and the complexities of intertwining blockchain with financial accounting. At the heart of the analysis is the undeniable evolution that financial accounting is undergoing, much due to blockchain. BT's core attributes, including decentralization, offer a fresh perspective and a set of benefits that can reshape long-standing accounting practices. Yet, as with any significant technological shift, its seamless fusion into prevalent accounting systems presents a myriad of challenges.

This paper is structured to guide the reader through this multifaceted landscape. It commences with an introduction to blockchain, acquainting the audience with its nuances through a review of pertinent literature. This foundation is pivotal to understand the subsequent segments. The narrative then unfolds the research methodology, providing transparency on the literature's selection and its review process. Such clarity ensures the findings and discussions are rooted in rigorous academic protocols. A significant portion of the exploration zeroes in on the relationship between blockchain and financial accounting. The spotlight then shifts to one of the most groundbreaking contributions of BT to accounting: its potential to pivot the age-old double-entry system to a more advanced triple-entry system. while blockchain's transformative potential in financial accounting is undeniable, acknowledging the sizable challenges looming is imperative. Overcoming these is paramount for its universal acceptance. The paper's primary ambition is to offer insights into BT's intricate role in financial reporting, serving as a compass for future endeavors aimed at its fruitful and safe integration.

**Literature Review**

Blockchain, the technology underpinning cryptocurrencies like Bitcoin, represents a revolutionary approach to recording and verifying transactions. At its core, a blockchain is a time-stamped, immutable chain of blocks, each storing a record, all linked in chronological order (Lewis, 2018). This structure ensures three critical features:

1. **Elimination of Intermediaries**: Blockchain operates on a decentralized system, which means there's no need for a centralized authority or intermediary to validate or oversee transactions.
2. **Immutability**: Once a block is added to the blockchain, the data it contains is permanent and unalterable. This robustness is due to the cryptographic hashes used to link each block to its predecessor. Every block contains the digital fingerprint (hash) of the previous block. So, any tampering attempt will alter not only the block in question but all subsequent blocks, making illicit changes almost impossible (Dinh et al., 2018).
3. **Decentralization**: The decentralized nature of the blockchain makes it inherently more secure and transparent, reducing vulnerabilities like fraud.

These features have profound implications beyond the world of cryptocurrencies. Indeed, while Bitcoin, introduced by Satoshi Nakamoto in 2008, remains the most famed application of blockchain (Nakamoto, 2008), the scope of this technology is far-reaching. Industries spanning real estate, healthcare, finance, and supply chain management have started to realize and harness the benefits of blockchain. Moreover, there's a growing consensus that blockchain could overhaul traditional accounting systems, lending more integrity and efficiency to the processes. The distinction between permissionless (public) and permissioned blockchains is a nuanced differentiation in the blockchain world. While anyone can access, validate, or participate in permissionless blockchains, making them highly secure and resistant to tampering (Giannetti & Wang, 2016; Patil & Puranik, 2019), permissioned blockchains are restricted. Gietzmann and Grossetti (2021) postulate that cryptocurrency-free permissioned systems might provide more value for businesses than those that integrate cryptocurrencies.

To harness the transformative potential of blockchain, both public and private sectors need to reassess their information infrastructures, considering decentralization. A more decentralized model could offer enhanced security and transparency. Additionally, merging this technology with accounting expertise can refine and redefine ledger designs for the future. despite its strong association with cryptocurrencies, blockchain offers immense transformative capabilities across various sectors. Its decentralization, transparency, and immutability attributes make it a robust tool with the potential to redefine traditional systems and processes, ensuring greater security, efficiency, and trustworthiness in transactions. Blockchain technology, often simply referred to as BT, fundamentally alters the way transactions are processed. At its most basic, it offers an alternative way to transfer value or information from one party to another.

Consider a conventional transaction: Party A wishes to pay Party B. Traditionally, this involves an intermediary, typically a bank. Party A sends money to the bank, which then forwards it to Party B. The transaction concludes once Party B acknowledges receipt of the funds. Blockchain transforms this process. Rather than relying on a middleman, Party A sends funds directly to Party B using a public key, a form of encryption that ensures data security. Once this transaction occurs, every node in the blockchain network springs into action to verify its legitimacy. They do this by comparing the transaction's cryptographic signature with historical data. Upon validation, each node appends this transaction to its unique record, termed a 'block'. Once the majority of nodes in the network reach a consensus, this block joins the existing chain of records, hence the term 'blockchain' (Ilbiz, 2020). This technology's inherent characteristics offer a myriad of advantages. Among the most pronounced is the ability to establish mutual trust in the data it hosts. By guaranteeing data integrity and providing unprecedented transparency, traceability, and auditability, blockchain can bridge trust deficits, especially vital in contexts like international trade where trust is often at a premium (Semerl, 2018). Nakashima (2018) takes this argument a notch higher, positing that blockchain's capabilities extend far beyond just facilitating trust. It can automate a vast array of organizational functions, reshaping how businesses operate. By streamlining operations, companies can realize greater efficiencies, cost savings, and transparency across various sectors.

The accounting field, in particular, stands to gain immensely from blockchain. Given its decentralized nature and transparency, blockchain can bolster the credibility and accuracy of accounting records. The distributed ledger system at the heart of blockchain means every transaction gets recorded across a multitude of nodes, making the data virtually tamper-proof. Consequently, instances of fraud or misrepresentation can be significantly reduced, leading to more reliable accounting practices (Kimani et al., 2020). Blockchain, although nascent, promises a future where transactions are more direct, secure, and transparent. As its potential continues to be unearthed, various sectors, especially accounting, are poised for substantial transformation, emphasizing a future where trust and accuracy in transactions are paramount. Blockchain technology (BT) brings forth a suite of benefits that promise to revolutionize the accounting field. Central to these benefits is the remarkable potential for cost savings and enhancements in efficiency (Chaney & Philipich, 2002). Given that blockchain can automate numerous accounting processes, the reliance on manual inputs dwindles. This paves the way for swifter operations and minimizes errors that typically arise from human intervention. As businesses deploy blockchain in their accounting practices, they stand to realize tangible cost savings. These savings aren't confined to the organization alone; even clients can benefit from reduced costs. Ultimately, the integration of blockchain in accounting sets the stage

for a smoother, less encumbered financial market, characterized by reduced frictions and greater transparency (Kimani et al., 2020).

## Research Methodology

This study embarked on a methodical journey to delve into the intricacies of blockchain's influence on financial accounting. The strategy? An exhaustive literature review, canvassing notable academic databases such as Wiley, Emerald, Springer Nature, Taylor and Francis, and the American Accounting Association. The research spotlighted specific terms like 'Blockchain in Accounting', 'Triple Entry System', and 'Artificial Intelligence in Accounting' to zero in on pertinent scholarly articles. From an initial pool of 58 potential papers, a meticulous evaluation streamlined the collection down to 46 exemplary works, filtered based on their alignment with the study's objectives, the depth of their research methods, and their core findings. The amassed literature, diverse in its scope, shed light on the multifaceted aspects of the subject, offering a panoramic view of blockchain's role in financial accounting. Noteworthy is the research methodology's dedication to quality and relevance. The study ensured a thorough and holistic body of literature by strategically leveraging multiple databases and honing in with precise search terms. Such methodological rigor lays a robust groundwork for ensuing discussions and findings, paving the way for an insightful discourse on the regulatory nuances associated with blockchain in the financial accounting arena.

## The Evolutionary Leap of Accounting through Blockchain

Modern accounting, with its roots stretching back to 13th-century Italian trade activities, has always aimed to bolster mutual trust and safeguard investor interests. This journey toward precision saw the birth of the double-entry bookkeeping system. Historically, Luca Pacioli, in his 1494 Venetian mathematics textbook, encapsulated this system which required every financial transaction to be logged in a minimum of two distinct accounts (Basu & Waymire, 2008). More than just a technique, double-entry bookkeeping was a strategic move to curb errors, thereby instituting a robust system of checks and balances. As business operations expanded and complexities arose from factors such as stock market regulations, there was an inevitable push toward evolving and sophisticated accounting systems.

However, despite the transformations and advancements in accounting practices over the centuries, the core mission persisted: delivering precise and transparent financial statements to a company's stakeholders. Mandated by law, regulated entities are obliged to offer timely and accurate financial insights, extending not only to traditional balance sheets and profit-loss accounts but also forecasting metrics and standardized financial ratios. Over time, the ambit of accounting expanded, capturing not just numbers on a sheet but also intricate details. The modern era has seen accounting adapting to new demands, incorporating quantitative and qualitative information disclosures about company valuations, associated risks, and other pivotal aspects (Chowdhury, 2019; Christensen et al., 2017; Fedyk & Hodson, 2019).

Audit discrepancies can compromise investor trust and disrupt capital markets, necessitating a continuous refinement of the audit process (Wang & Wang, 2022). Over the years, various accounting scandals have put the spotlight on the audit profession. High-profile cases, such as those of Enron and WorldCom, led to an uproar, calling for rigorous reforms in the accounting and auditing spheres. The U.S. Congress enacted the Sarbanes-Oxley Act (SOX) in 2002 to address these concerns and restore public trust. This landmark legislation targeted enhanced standards across corporate boards, executive leadership, and public accounting entities in the U.S., aspiring to usher in an era of transparency, accountability, and elevated corporate governance (Xia et al., 2014). A notable provision of SOX is its requirement for a comprehensive report accompanying the auditor's evaluation of financial statements. This report provides an opinion and elaborates on the auditor's findings. Another significant mandate of SOX pertains to internal control over financial reporting (ICFR). Auditors are required to detail the extent of their ICFR tests and affirm with reasonable assurance that ICFR is functionally effective, considering all material aspects. Such measures underscore the pivotal role of audits as independent control mechanisms, aiming to substantially minimize discrepancies in firm disclosures. Despite the rigorous regulations of SOX, it's essential to note that no system, regardless of its comprehensiveness, can entirely eliminate the risk of fraud or errors. While these

measures have fortified the auditing process and bolstered public trust, they cannot assure an absolute safeguard against all financial malpractices.

**Auditing with Smart Contracts**

The advent of digital transformation, characterized by an influx of data and technological innovations, necessitates businesses to revisit and revise their operational frameworks. Technological advancements such as deep learning and Big Data have revolutionized the manner in which information is collected, analyzed, and disseminated. These technologies find applications in diverse areas, including leveraging social media data for reputation risk prediction and implementing blockchain-driven smart contracts in sectors like finance and supply chain management (Rozario & Vasarhelyi, 2018). Blockchain technology (BT), renowned for its cryptographic and consensus mechanisms, holds promise for redefining the realms of accounting, auditing, and accountability. By offering a streamlined and innovative transaction tracking and validation approach, BT could manifest in tangible benefits like cost reductions and enhanced accuracy (Vasarhelyi et al., 2015). Further, blockchain's intrinsic nature of providing a tamper-resistant transactional record can significantly uplift the levels of transparency and accountability within accounting.

One of the most groundbreaking applications of BT is smart contracts. Often perceived as encoded human actions, smart contracts embed vital terms within a blockchain. They are designed to autonomously execute when certain predefined conditions materialize (Schmitz & Leoni, 2019; Coyne & McMickle, 2017). These contracts are not merely limited to recording; they facilitate the automatic enactment of terms agreed upon by multiple parties (Deloitte, 2019). This heightened transparency fostered by smart contracts invariably augments trust between firms and their respective stakeholders. Adding to this perspective, Gietzmann and Grossetti (2021) highlighted the potentially disruptive nature of these smart contracts. Beyond their intrinsic capacity to obviate the need for redundant intermediaries, smart contracts introduce a lucid and resilient language. This language is immune to human subjectivity and circumvents the often ambiguous legal jargon, paving the way for clearer, more straightforward contract interpretations.

In the face of the rapidly advancing digital economy, the conventional audit model finds itself at a pivotal juncture. The increased inclination towards automation and the predictive characteristics of financial statement audits compel external auditors to reevaluate their practices. Specifically, they must recognize and assimilate the profound influences of advanced audit analytics, blockchain, and smart contracts to ensure they continue to provide high-quality audits amidst an intricate business milieu (Rozario & Vasarhelyi, 2018). As cybersecurity threats loom large, especially with databases that chronicle daily transactions, the aforementioned technologies' significance becomes paramount. By strategically adopting these technological innovations, auditors can combat the pervasive cyber domain threats and harness the potential efficiencies offered by blockchain and smart contracts (Rozario & Vasarhelyi, 2018). Blockchain, for instance, stands out with its promise to elevate transparency and accountability levels in the auditing sector. Its immutable nature ensures the provision of a tamper-resistant transaction log. Consequently, firms can exploit blockchain technology (BT) to construct audit trails, which can be instrumental in scrutinizing the veracity of financial declarations.

Notwithstanding their adherence to established accounting norms—encompassing documentation, presentation, and disclosure—companies have a degree of latitude in selecting specific accounting methods, including policies, estimates, and judgments (Yu et al., 2018). A prevailing practice among corporations is the nondisclosure of intricate accounting procedures; instead, they primarily offer standard financial statements to external stakeholders. Such an approach serves a dual purpose: it preserves corporate confidentiality while simultaneously shielding certain operational aspects. Nevertheless, this practice is not devoid of shortcomings. Be it a conventional paper-based ledger or its contemporary electronic counterpart, the integrity of transactional records remains vulnerable to illicit alterations and damages. Furthermore, there lurks a sinister possibility wherein organizational leaders—be they managerial personnel or dominant shareholders—might create spurious accounts or even manipulate existing ones to further their individualistic agendas. Such clandestine operations exacerbate the opacity of traditional accounting mechanisms. This intricacy, in turn, poses a formidable challenge for external stakeholders, encompassing investors and regulatory entities, rendering it arduous for them to pinpoint anomalies or discrepancies. Integrating blockchain technology into this framework can substantially mitigate these complications.

Given its foundational characteristics, BT is poised to significantly diminish discrepancies and errors in accounting, ushering in an era of enhanced transparency and trustworthiness in the financial domain. Blockchain technology (BT) holds the potential to redefine the financial accounting landscape by introducing digital ledger systems capable of tracking all transactions within a specific network. This technological innovation may revolutionize financial statement preparation by making transaction data continuously available and updated in real-time. Blockchain's core attributes ensure that ledgers built on this platform offer unparalleled transparency. Being inherently tamper-resistant, such ledgers derive their robustness from stringent security measures. Once transaction data is appended to the public blockchain, it becomes virtually immutable. Multiple copies of this data, preserved across thousands of backups, assure its security, and the inherent transparency ensures every network member can access these records (Cai, 2021; Yermack, 2017).

Auditing, another critical facet of financial operations, stands to gain significantly from blockchain. The technology allows auditors to swiftly and efficiently conduct tests of existence. Leveraging smart contracts, auditors can reshape pre-validated data, enhancing the audit's efficiency. Furthermore, blockchain's capability extends into the realm of risk management. Through advanced predictive analytics, unusual patterns in transactions, previously undetected, can be identified. For instance, the emergence of an unfamiliar purchase order pattern, hinting at potential fraudulent activities, can be detected early. Such timely insights enable a deeper understanding of underlying behaviors, allowing organizations to pre-empt substantial financial losses (Bonyuet, 2020). However, the integration of blockchain into auditing and financial operations implies an inevitable shift in the professional skillsets required. Audit firms might find themselves in need of larger teams, encompassing diverse expertise. Specifically, there would be an increasing demand for IT specialists proficient in coding languages tailored to design blockchain applications addressing their clients' unique requirements (He et al., 2016). In sum, blockchain technology offers promising avenues to enhance transparency, efficiency, and risk management in financial accounting and auditing, albeit demanding an adaptive approach to skill acquisition and application.

**Intelligent Audit Processes: Obstacles and Prospects**

Blockchain technology (BT) holds the potential to revolutionize the fields of accounting, auditing, and accountability. However, its integration is still in its infancy, with multiple hurdles inhibiting its broad acceptance. A significant limitation is blockchain's inability to manage a corporation's extensive accounting data and the substantial monetary commitment required for its incorporation (Cernea et al., 2022). Furthermore, the intrinsic transparency of blockchain raises concerns about unrestricted information access, jeopardizing firms that prioritize safeguarding their trade secrets. Standardization also presents a challenge, as a universal application of blockchain in auditing would mandate every audit firm to converge on a single platform, a currently untenable proposition. Nevertheless, the potential advantages of distributed ledger technology (DLT), such as blockchain, cannot be understated for the accounting sector. Its primary appeal lies in its heightened transparency and robust security protocols. Blockchain facilitates a distributed ledger system that meticulously documents all transactions on a universally accessible public database. A defining feature of this technology is the immutability of its records; once data is entered into the blockchain, it becomes permanent and resistant to any form of alteration or deletion (Cai, 2021; Yermack, 2017). This ensures unprecedented levels of transparency and security compared to existing accounting methodologies.

Moreover, the integration of smart contracts—a type of self-executing contract with the terms of the agreement directly written into code—can revolutionize routine operations. These contracts can efficiently automate manual tasks such as invoicing and payments, heralding substantial reductions in both processing durations and associated costs. Additionally, the audit domain could experience a paradigm shift with smart contracts that autonomously validate transactions against predefined criteria before their finalization, streamlining and enhancing the overall auditing process. Blockchain technology (BT) offers a transformative potential for businesses in enhancing transparency, ensuring data traceability, and safeguarding against unauthorized alterations. These inherent qualities present an ideal solution for firms aspiring to bridge the information chasm that often exists between them and their stakeholders, notably investors (Healy & Wahlen, 1999). In the short-term application, businesses can harness blockchain to voluntarily disclose data beyond statutory requirements. This can encompass prospective earnings

projections, Corporate Social Responsibility (CSR) endeavors, and other strategically advantageous insights (Cernea et al., 2022). Such proactive dissemination empowers investors with a more comprehensive understanding of a firm, enhancing their decision-making efficacy.

The merits of employing BT for public data distribution are manifold. Historically anchored records allow stakeholders to corroborate and contextualize current data, an invaluable asset in periods marked by uncertainties. Sharing data via sanctioned avenues influences investors' decisions, potentially culminating in more precise evaluations of a company's trajectory and performance (Yu et al., 2018). As the recognition of voluntary disclosure's value as an instrumental signaling tool expands—principally for curbing trust-associated expenditures—more entities will likely gravitate towards this paradigm. Consequently, the integration of BT into accounting, auditing, and accountability realms promises heightened efficiency, pinpoint accuracy, and unparalleled transparency in financial reporting. This fosters amplified trust among report users. A salient advantage lies in the reduced dependency on intermediaries, coupled with the bolstered security attributed to immutable ledgers. By chronicling every transaction, blockchain has the potential to substantially curtail, if not entirely obliterate, fraudulent undertakings. This translates to tangible cost savings for businesses, obviating the need for exhaustive audits traditionally initiated to unearth and scrutinize fraudulent activities (Yermack, 2017). By meticulously weighing such disclosures' advantages and potential downsides, firms can judiciously decide on the information spectrum they unveil. This commitment to transparency and ethical conduct fortifies their rapport with investors, who invariably appreciate the augmented clarity into a firm's operational and financial health. From a fiscal perspective, blockchain's implementation could yield cost efficiencies by potentially diminishing the remunerations commanded by auditors and accountants. Given the records are enshrined in a secure, unalterable ledger, the frequency of requiring these professional services might wane. Additionally, the duration to draft financial statements could witness a notable contraction, courtesy of automation (Cai, 2021). Moreover, companies are encouraged to chronicle standard contents, encompassing CSR disclosures, business evaluations, and earnings forecasts on the blockchain. At least in the near term, this voluntary disclosure should be dictated by the firm's discretion. The periodicity and content of such disclosures should be strategically timed, especially when firms aim to create a positive market impression by unveiling non-confidential data (Fullana & Ruiz, 2021).

**Transitioning from Double to Triple Entry Systems**

As introduced by Grigg (2005), triple entry accounting brings a paradigm shift by involving an external entity, like a bank or notary, to authenticate ledger entries. This evolution from the conventional double entry system challenges several foundational aspects related to blockchain's integration. Cryptographic techniques, such as hashing functions and digital signatures, must address data validity (Dai & Vasarhelyi, 2017). Additionally, blockchain's timestamping capabilities need enhancement to meticulously capture transaction specifics, from debits and credits to stakeholder details (Dai & Vasarhelyi, 2017). The deployment of smart contracts also demands elevation. For successful integration into client systems, they should facilitate the creation of primary documentation, analogous to the functionalities of modern enterprise resource planning tools. This evolution could necessitate roles emphasizing IT audit skills and coding expertise (Drake et al., 2019; Hail et al., 2017).

There have been prolific discussions on facilitating the uptake of this triple-entry system. Schmitz and Leoni (2019) argue that infusing blockchain into accounting and auditing mandates a significant reconfiguration of prevailing methodologies. This includes the inception of novel auditing standards and guidelines. Given blockchain's capacity for instantaneous verification and data accessibility, the traditional auditor role necessitates re-evaluation. Specifically, consideration should be given to the nature of evidence auditors rely on to vouch for the credibility of financial declarations. The duo emphasize that future investigative endeavors should probe deeper into the repercussions of blockchain on auditing. This includes crafting new audit practices and discerning the technology's potential hazards and prospects. A salient point they underscore is that auditors must possess an intricate comprehension of blockchain and its inherent risks, ensuring stakeholders receive robust assurances.

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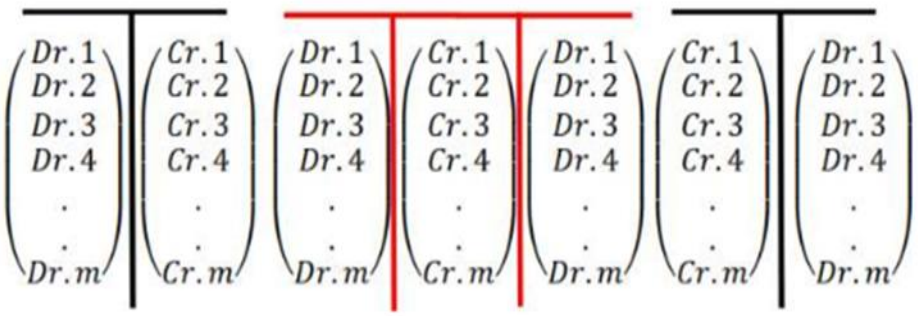
Blockchain technology (BT) has revolutionized the traditional accounting system through its decentralized ledger framework. Unlike centralized systems where a single node holds power, blockchain allows for the distribution of ledgers across global stakeholders. (Qadir & Ahmed, 2022) Each participant in this network has access to the ledger and can maintain a private copy. This decentralized model ensures no single entity has exclusive control, thus reducing the risks associated with centralized general ledgers where one source dictates the ledger's contents. The result is a more democratized, transparent, and self-regulating system that is less vulnerable to the pitfalls of centralization.




**Figer 1.** ledger with triple entry accounting model (Qadir & Ahmed, 2022)

Recent advancements in financial technology have prompted suggestions for enhancing transactional security and integrity. A notable proposal involves using cryptographic hashes to produce distinct fingerprints for every transaction, aiming to bypass intermediaries. However, this raises issues about data veracity and system scalability (Dai & Vasarhelyi, 2017). To mitigate these concerns, a subsequent recommendation has been made to incorporate a 'state' element. This 'state' is characterized as a cumulative set of all prior commitments within a designated jurisdiction. To ensure the authenticity of this state, it can be confirmed through digital endorsements from credible entities, like banks. This method retains the decentralized nature of transactions while ensuring data robustness. Furthermore, this 'state' could become an essential component of the ledger, encompassing details like title, timestamp, and historical comments. Additionally, links to primary source documents can be made accessible in the public domain, subject to authorization from pertinent authorities.

## Conclusion

Blockchain, a decentralized and shared database, promises a significant shift in how transactions are conducted and recorded. By employing cryptographic methods, blockchain creates a chronologically linked, unalterable ledger, which is transparent to and verifiable by all participants without a centralized governing body (Dai & Vasarhelyi, 2017). This system organizes data into "blocks" connected by digital fingerprints known as hashes. Such a structure ensures the ledger's immutability and enables direct interactions between network members, thereby eliminating the necessity for intermediaries, including auditors. This innovative technology brings potential advantages to financial reporting, particularly in terms of efficiency, transparency, and security. Blockchain's capacity to bypass intermediaries and introduce a distributed ledger could significantly alter conventional accounting methods, reducing fraud risks. Yet, blockchain's integration into financial accounting is not straightforward. Challenges such as the need for standardization, scalability issues, and data privacy concerns pose barriers to its seamless incorporation and broad acceptance (Drake et al., 2019). To unlock blockchain's full potential in the domain of financial accounting, professionals must gain a deep understanding of the technology and grasp its comprehensive implications. As the adoption of blockchain technology surges, it is imperative to establish robust regulatory frameworks and governance structures. These mechanisms would steer its implementation and ensure stakeholder protection and compliance with best practices (Hail et al., 2017). As the landscape of financial reporting evolves with technological advancements, embracing and adapting to blockchain becomes paramount for future-proofing the industry.

## References

Atlam, H. F., Alenezi, A., Alassafi, M. O., & Wills, G. (2018). Blockchain with internet of things: Benefits, challenges, and future directions. International Journal of Intelligent Systems and Applications, 10(6), 40-48.

Basu, S., & Waymire, G. (2008). Has the importance of intangibles really grown? And if so, why?. Accounting and business research, 38(3), 171-190.

Bonsón, E., & Bednárová, M. (2019). Blockchain and its implications for accounting and auditing. Meditari Accountancy Research, 27(5), 725-740.

Bonyuet, D. (2020). Overview and impact of blockchain on auditing. Int. J. Digit. Account. Res, 31-43.

Buterin, V. (2014). A next-generation smart contract and decentralized application platform. white paper, 3(37), 2-1.

Cai, C. W. (2021). Triple-entry accounting with blockchain: How far have we come?. Accounting & Finance, 61(1), 71-93.

Cernea, M. S., Ene, O. C. B., Monac, C. M., & VrÃ, A. (2022). The Perspective Of The Implementation Of The Blockchain Within Romanian Companies. Social-Economic Debates, 11(1), 1-6.Semerl, K. (2018). Blockchain–A potential technological revolution for increasing efficiency in cross-border trade processes? [Working paper]. Blockchain Research Accelerator.

Chaney, P. K., & Philipich, K. L. (2002). Shredded reputation: The cost of audit failure. Journal of accounting research, 40(4), 1221-1245.

Cheng, C., & Huang, Q. (2020, January). Exploration on the application of blockchain audit. In 5th International Conference on Economics, Management, Law and Education (EMLE 2019). Atlantis Press.

Chowdhury, E. K. (2019). Transformation of Business Model through BT, The Cost & Management, Institute of Cost and Management Accountants of Bangladesh. 47(5), 4-9.

Christensen, H. B., Floyd, E., Liu, L. Y., & Maffett, M. (2017). The real effects of mandated information on social responsibility in financial reports: Evidence from mine-safety records. Journal of Accounting and Economics, 64(2-3), 284-304.

Coyne, J. G., & McMickle, P. L. (2017). Can blockchains serve an accounting purpose?. Journal of Emerging Technologies in Accounting, 14(2), 101-111.

Dai, J., & Vasarhelyi, M. A. (2017). Toward blockchain-based accounting and assurance. Journal of Information Systems, 31(3), 5-21.

Deloitte. (2019). Industry insight New Zealand ports and freight yearbook. Retrieved from https://www2.deloitte.com/nz/en/pages/finance/articles/newzealand-ports-and-freight-yearbook.html

Dinh, T. T. A., Liu, R., Zhang, M., Chen, G., Ooi, B. C., & Wang, J. (2018). Untangling blockchain: A data processing view of blockchain systems. IEEE Transactions on Knowledge and Data Engineering, 30(7), 1366-1385.

Drake, M. S., Lamoreaux, P. T., Quinn, P. J., & Thornock, J. R. (2019). Auditor benchmarking of client disclosures. Review of Accounting Studies, 24(2), 393-425.

Fedyk, A., & Hodson, J. (2019). Trading on talent: Human capital and firm performance. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3017559.

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

Giannetti, M., & Wang, T. Y. (2016). Corporate scandals and household stock market participation. The Journal of Finance, 71(6), 2591- 2636.

Gietzmann, M., & Grossetti, F. (2021). Blockchain and other distributed ledger technologies: where is the accounting?. Journal of Accounting and Public Policy, 40(5), 106881.

Grigg, I. (2005). Triple Entry Accounting, Systemics Inc. http://iang.org/papers/triple_entry.html

Hail, L., Muhn, M., & Oesch, D. (2021). Do Risk Disclosures Matter When It Counts? Evidence from the Swiss Franc Shock. Journal of Accounting Research, 59(1), 283-330.

He, X., Pittman, J., & Rui, O. (2016). Reputational implications for partners after a major audit failure: Evidence from China. Journal of Business Ethics, 138(4), 703-722.

Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. Accounting horizons, 13(4), 365-383.
Ilbiz, E. (2020). Blockchain: a new disruptive innovation for knowledge risk management. Knowledge Risk Management: From Theory to Praxis, 119-132.
Kimani, D., Adams, K., Attah-Boakye, R., Ullah, S., Frecknall-Hughes, J., & Kim, J. (2020). Blockchain, business and the fourth industrial revolution: Whence, whither, wherefore and how? Technological Forecasting and Social Change, 161, 120254.
Lewis, A. (2018). The basics of bitcoins and blockchains: an introduction to cryptocurrencies and the technology that powers them. Mango Media Inc.
Monrat, A. A., Schelén, O., & Andersson, K. (2019). A survey of blockchain from the perspectives of applications, challenges, and opportunities. IEEE Access, 7, 117134-117151.
Nakamoto, S. (2008). A peer-to-peer electronic cash system. Decentralized business review, 21260.
Nakashima, T. (2018). Creating credit by making use of mobility with FinTech and IoT. IATSS Research, 42(2), 61-66.
Patil, S., & Puranik, P. (2019). BT. International Journal of Trend in Scientific Research and Development, 3(4), 573-574.
Qadir, A. M., & Ahmed, A. (2022). Blockchain Technology and Accounting: The TripleEntry Affecting Transparency. Telematique, 4950–4958.
Rozario, A. M., & Vasarhelyi, M. A. (2018). Auditing with Smart Contracts. International Journal of Digital Accounting Research, 18.
Schmitz, J., & Leoni, G. (2019). Accounting and auditing at the time of blockchain technology: a research agenda. Australian Accounting Review, 29(2), 331-342.
Semerl, K. (2018). Blockchain–A potential technological revolution for increasing efficiency in cross-border trade processes? [Working paper]. Blockchain Research Accelerator.
Stanciu, A. (2017). Blockchain based distributed control system for edge computing. 21st international conference on control systems and computer science (CSCS) (pp. 667-671). IEEE.
Vasarhelyi, M. A., Kogan, A., & Tuttle, B. M. (2015). Big data in accounting: An overview. Accounting Horizons, 29(2), 381-396.
Wang, J., & Wang, D. (2022). Corporate Fraud and Accounting Firm Involvement: Evidence from China. Journal of Risk and Financial Management, 15(4), 180.
Warburg, B. (2016). How the blockchain will radically transform the economy. TED Summit., www.ted.com/talks/bettina_warburg_how_the_blockchain_will_ra dically_transform_ the_economy?language=en
Xia, H., Dawande, M., & Mookerjee, V. (2014). Role refinement in access control: Model and analysis. INFORMS Journal on Computing, 26(4), 866-884.
Yermack, D. (2017). Corporate governance and blockchains. Review of Finance, 21(1), 7-31.
Yu, T., Lin, Z., & Tang, Q. (2018). Blockchain: The introduction and its application in financial accounting. Journal of Corporate Accounting & Finance, 29(4), 37-47