

# Advantages and Challenges of Blockchain in Accounting: A Case Study of Deloitte's Rubix

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**Abstract.** Currently, blockchain technology is increasingly gaining attention. Characterized by decentralization, immutability, and transparency, it holds broad application prospects in numerous fields. In the accounting sector, the frequent occurrence of distorted financial information in enterprises can be effectively addressed by leveraging blockchain technology to enhance efficiency and ensure the quality of accounting information. This paper begins by explaining the nature and characteristics of blockchain, then categorically explores its specific advantages in fundamental accounting activities, namely confirmation, measurement, recording, and reporting. Subsequently, using Deloitte's blockchain platform, Rubix, as a case study, it elaborates on the practical application of blockchain technology in accounting. Finally, the paper dialectically analyzes the challenges faced by blockchain technology in the accounting industry and offers relevant recommendations.

**Keywords:** Blockchain; Accounting; Rubix Blockchain Platform.

## 1. Introduction

With the rapid advancement of science and technology, human society has gradually stepped into the era of Industry 4.0. Technologies such as big data, artificial intelligence, mobile Internet, and cloud computing have increasingly infiltrated every aspect of human life, marking the official arrival of the digital intelligence era. Blockchain is a new technology that has exerted revolutionary influences following the advent of the Internet. Relevant national departments have placed great emphasis on the research, development, and application of high-end and cutting-edge technologies including blockchain, 5G, and artificial intelligence. Since 2016, blockchain has been officially incorporated into the national strategic development plan. By 2018, the state had actively introduced over 40 specific policies to support the development of blockchain and foster emerging technology industries, including those related to blockchain. Moreover, according to data from Tencent, the Chinese blockchain industry is expected to reach a market value of 173 million yuan in 2020, further attesting to its application effectiveness across various industries.

Enterprises are also actively responding to the national call by applying blockchain technology in the accounting domain. Deloitte has launched the Rubix enterprise blockchain platform, and Kingdee and Yonyou are also venturing into the blockchain field, exploring the application of this innovative technology in accounting. Blockchain technology establishes a novel trust mechanism through technical means such as data encryption, distributed networks, and timestamps. By adopting a distributed and decentralized approach, it creates a "ledger" for recording transaction records. This technology integrates a series of professional disciplines including computer programming, mathematics, the Internet, and cryptography. Through the formation of a chained data structure and the incorporation of cryptographic equations, it ensures characteristics such as data tamper-resistance, traceability, and anonymity, which are highly congruent with the requirements for accounting information, such as authenticity, reliability, traceability, and information security and confidentiality. Simultaneously, the construction of accounting informatization in China is also progressing steadily. Software-based bookkeeping has almost entirely replaced manual bookkeeping. Accounting information, which was initially manually entered into accounting vouchers, has gradually evolved to be automatically imported from various systems through well - connected interfaces.

Given the characteristics of blockchain, it is foreseeable that after the large-scale application of blockchain technology in the financial field, the most notable distinction compared to the traditional financial model will be the enhanced assurance of accounting information quality. However, how blockchain will impact the handling of accounting operations, the disclosure of accounting information, and the maintenance of accounting information quality, as well as the changes that will occur in the financial domain, are all issues worthy of in-depth academic exploration. This paper commences by delving into the essence and characteristics of blockchain, categorically examining the specific advantages of blockchain technology in fundamental accounting operations, namely recognition, measurement, recording, and reporting. Subsequently, by integrating the case of Deloitte's blockchain platform, Rubix, it elaborates on the practical applications of blockchain technology in accounting. Finally, it critically analyzes the challenges faced by blockchain technology in the accounting industry and puts forward corresponding recommendations.

## **2. Overview of Blockchain**

### **2.1. The Essence of Blockchain**

The revolutionary concept of blockchain was first systematically elaborated by the scholar known under the pseudonym Satoshi Nakamoto in his seminal 2008 paper, "Bitcoin: A Peer-to-Peer Electronic Cash System." This groundbreaking work meticulously constructed the framework of an electronic cash system based on multiple innovative technologies, including peer-to-peer (P2P) network technology, encryption algorithms, timestamp mechanisms, and blockchain technology. Within this system, blockchain is essentially a decentralized, distributed ledger database that serves as the underlying technical support for Bitcoin transaction settlement. [1] It generates a series of chronologically linked data blocks through cryptographic methods. Each data block accurately records all transaction information across the entire network within a specific time period. This information is not only used to verify the validity of transactions but also serves as the basis for generating subsequent blocks.

It is worth noting that the unique data structure employed by blockchain technology endows it with distinct technical characteristics: each new block contains the cryptographic hash value of the previous block, forming an interlinked chain structure. At the same time, a consensus mechanism ensures consistency in the ledger state across all participating nodes. This sophisticated design makes any attempt to tamper with historical records technically nearly impossible, as it would require simultaneously controlling over 51% of the network nodes.

With the continuous evolution and iterative upgrades of blockchain technology, its inherent features of immutability and irreversibility have become increasingly prominent, gradually forming the unique advantage of "Once recorded, eternally preserved." This technical characteristic enables blockchain systems to achieve instant solidification and storage of transaction information while ensuring data synchronization across all network nodes through distributed ledger technology. More importantly, through ingenious incentive mechanism design, blockchain technology has innovatively realized a model of universal participation without the need for third-party intermediaries. [2] This allows every participant to become both a manager and maintainer of the network, collectively building an open, transparent, traceable, and trustworthy value transfer network. These breakthrough features have not only laid a solid foundation for the development of digital currencies but have also provided revolutionary technical solutions for establishing new trust mechanisms across various industries.

### **2.2. Characteristics of Blockchain**

#### **2.2.1. Decentralization.**

Decentralization is a core technical characteristic of blockchain. In this architecture, all network nodes are entirely equal in status, enabling direct peer-to-peer connections and communication without relying on any centralized institutions or intermediaries. [3] When a node receives and broadcasts a

new transaction or data, this information is not immediately accepted. Instead, it is propagated across the entire network for other numerous nodes to independently and concurrently verify and validate according to a pre-established consensus algorithm.

This high-consistency mechanism, based on collective agreement, ensures that only data validated and approved by the network is accurately added to each node's copy of the ledger, achieving ultimate data synchronization. Consequently, every node fulfills the complete functions of the network, acting as both a service provider and a validator. Each can independently record transaction data and engage in peer-to-peer sharing across the entire network. This design grants the system exceptional robustness: data errors, loss, or even malicious tampering at any single node will be detected and rejected by the honest nodes in the network, thus preventing the corruption of the entire dataset. [4] This fundamentally guarantees the final consistency, immutability, and historical integrity of the data across the network.

### **2.2.2. Distributed Ledger.**

A distributed ledger, also referred to as a shared ledger, is a database that is replicated, synchronized, and shared across multiple geographically dispersed computer nodes. Its core principle is that each participating node in the network independently maintains a complete and identical copy of the ledger, and each node can autonomously propose updates to its local copy based on predefined rules.

This architecture fundamentally adopts a decentralized model, moving away from traditional centralized data storage and management authorities. It guarantees the autonomy of each node, enabling them to independently construct, verify, and record transactions, thereby eliminating the risk of a single point of failure. To coordinate the updates from these independent nodes and ensure they eventually converge to a consistent state (a concept known as "state consensus"), the system employs a process called a "consensus mechanism" to essentially "vote" on the validity of proposed ledger updates. [5] This consensus is not achieved through human intervention but is automatically executed via sophisticated cryptographic algorithms, enabling trustless collaboration.

Once the nodes in the network reach consensus on a new state of the ledger, the system automatically updates itself. The latest, agreed-upon, and validated version of the ledger is then synchronously distributed and securely stored on every participating node. Blockchain technology is a premier implementation of this distributed ledger technology. [6] Through this model, it constructs a data recording system that is highly transparent and extremely resistant to tampering, providing robust guarantees for data integrity, traceability, and security at the most fundamental technical level.

### **2.2.3. Intermediary-Free.**

In a blockchain network, the verification, recording, and management of data and transactions do not rely on a single centralized third-party institution or intermediary. Instead, this process is collectively completed by multiple distributed nodes within the network through a consensus mechanism. Each node continuously operates according to predefined, immutable algorithmic rules, enabling highly efficient peer-to-peer data exchange and synchronization. This architecture significantly enhances the overall level of automation and intelligence within the system.

The revolutionary significance lies in its elimination of the need for any traditional "trusted third party" for endorsement. Participants no longer need to establish trust by disclosing personal information, because trust is not vested in an intermediary. Instead, it is built upon mathematical principles and code-based rules, materialized through the consensus of the entire network. [7] This fundamentally reduces the extra costs associated with establishing trust, significantly streamlines transaction processes and structures, and paves the way for new paradigms in economic activity and social collaboration.

### **2.2.4. High Transparency.**

Openness and transparency stand as the most defining characteristics of blockchain technology. Within a blockchain system, with the exception of user identity information, which is strictly

protected through cryptographic means. This distributed ledger architecture ensures that every node possesses and maintains a complete, synchronized copy of the data, allowing public information to circulate freely across the entire network. More critically, any transaction record initiated by a single node must be broadcast to the entire network and undergo rigorous verification and collective confirmation by the vast majority of nodes according to the consensus algorithm before it is officially recorded. [8] This mechanism of "collective oversight" fundamentally eliminates the possibility of data being unilaterally concealed or altered, thereby robustly guaranteeing information transparency, auditability, and ultimate credibility.

Specifically, every transaction on the blockchain, once validated, is timestamped and bundled with others into a "block." This block is then processed through a cryptographic hash function to generate a unique digital fingerprint. This has not only represented a digest of all data within the block but also crucially links to the hash value of the previous block, forming a chronologically ordered, interlinked, and continuous chain. [8] This chained structure allows anyone to easily trace the complete lifecycle of any specific transaction, including details such as the sender, receiver, timestamp, and amount, making the origin and flow of data clear, verifiable, and traceable.

### **2.2.5. Encryption.**

Blockchain technology does not rely on a single innovation but rather creates a decentralized, highly automated, and sophisticated trust framework through the deep integration of asymmetric cryptography with other technologies like consensus mechanisms and smart contracts. Within this framework, asymmetric cryptography plays a foundational role, providing the essential guarantee for identity authentication and data security. [9] The core of this algorithm lies in the use of a mathematically linked pair of keys: a public key and a private key. The public key can be openly distributed, much like a bank account number, and is used to receive encrypted messages from others or to verify digital signatures. The private key, however, must be kept absolutely secret by the user and is used to decrypt received messages or to create digital signatures for outgoing transactions. This asymmetric model creates a secure one-way function.

Compared to traditional symmetric encryption, the advantages of asymmetric cryptography are profound. It completely eliminates the complex requirement and security risk of pre-sharing a secret key between communicating parties. In a blockchain network, a user's public key often serves directly as their publicly identifiable address for receiving assets, while the private key acts as the sole credential authorizing the spending of those assets. [10] Because it is computationally infeasible to derive the private key from its corresponding public key, which based on mathematical problems like the difficulty of factoring large primes, it offers security far surpassing that of symmetric encryption and is extremely resistant to brute-force attacks. This lays a solid and secure foundation for the entire blockchain system's trustworthy operation.

## **3. Advantages of Blockchain in Accounting Operations**

### **3.1. Accounting Recognition**

Accounting recognition serves as the starting point of the entire accounting cycle. Its core task is to identify and determine which economic transactions and events should enter the accounting information system, and to decide which accounting elements they belong to and when they should be recorded. The accuracy and reliability of this stage directly determine the quality of subsequent measurement, recording, and reporting. The traditional accounting recognition process relies heavily on manual judgment and operation, possessing inherent limitations. [11] The introduction of blockchain technology, through its unique technical architecture, fundamentally reshapes the accounting recognition process, demonstrating significant advantages.

Firstly, the distributed consensus mechanism ensures information accuracy. Accounting recognition requires joint verification by multiple independent nodes in the network, with records only made after consensus is reached. This mutual restraint mechanism effectively prevents data tampering,

safeguarding the authenticity and reliability of accounting information from the source. Secondly, timestamp technology enables complete traceability. Each transaction is assigned a unique and immutable timestamp, forming a continuous and transparent data chain. This allows complete tracing of any accounting recognition, significantly enhancing audit transparency and information credibility. Thirdly, distributed storage ensures system robustness. [12] Data is backed up across multiple nodes throughout the network, allowing the system to continue normal operation even if some nodes fail, thus ensuring the continuity of accounting recognition work and data security.

This technical architecture transforms the accounting recognition process from closed to open, shifting from reliance on human judgment to dependence on technical verification, significantly improving accounting information quality.

### **3.2. Accounting Measurement**

The choice of accounting measurement methods is susceptible to manipulation. Historical cost, a commonly used method, is easily affected by inflation and technological advances, leading to discrepancies between recorded asset values and actual replacement costs. Some companies exploit these differences to manipulate profits. Similarly, fair value measurement is prone to inaccuracies due to market volatility and subjective judgments.

Blockchain can mitigate these issues and reduce manipulation. When using historical cost, blockchain records past values in blocks, allowing companies to retrieve actual values at specific points via timestamps. Significant discrepancies between historical and replacement costs trigger alerts in integrated management systems, prompting timely updates. In fair value measurement, the need for multi-node verification minimizes manipulation, while integration with public chains enables faster and more accurate market data transmission, ensuring fair value reflects true market conditions. [13] Furthermore, blockchain stores measurement-related data in blocks, allowing financial staff to track cost and value changes by comparing similar transactions, leading to more precise and efficient accounting measurements.

### **3.3. Accounting Recording**

Traditional double-entry bookkeeping records changes in accounting information through debits and credits but fails to capture deeper business context. Moreover, the separation between operational and financial lines hinders data feedback to frontline staff, and business personnel may struggle to interpret financial reports due to a lack of accounting expertise. Finally, double-entry bookkeeping tracks value changes but does not explain the causes or impacts, limiting management's ability to make informed decisions.

Blockchain-enabled triple-entry bookkeeping adds a third dimension, "Sa" to the conventional "debit" and "credit" incorporating business activity information while maintaining the accounting equation "Assets = Liabilities + Equity." When recording daily transactions, the "Sa" entry captures key transaction details, timestamps them, and generates a unique identifier, enabling real-time traceability. Business information logged in the "Sa" entry integrates operational processes into financial data. Financial staff can record and track transactions in the "Sa" entry and provide real-time feedback to operational departments via private chains. Blockchain also supports real-time tracking and sharing of financial information, allowing managers to leverage business insights from accounting records for better decision-making, optimized resource allocation, and enhanced operational efficiency.

### **3.4. Accounting Reporting**

Traditional financial statements, as the primary means of accounting information presentation, exhibit significant limitations: firstly, the report content mainly consists of highly aggregated financial data, making it difficult to present key operational details and forward-looking information; secondly, reporting suffers from notable timeliness lag, as statements are only finalized after the accounting

period ends, resulting in users often receiving "outdated" information that fails to adapt to rapidly changing market conditions.

Blockchain technology brings important transformations to financial reporting through its unique technical advantages: Firstly, blockchain enables real-time and continuous reporting. Based on distributed ledger technology, transactions can be recorded and updated in real-time after being verified by nodes, breaking the fixed-cycle constraints of traditional financial reporting. This continuous updating feature allows information users to access a company's latest financial data promptly through authorized channels, significantly enhancing the timeliness and decision-relevance of reports. Secondly, blockchain facilitates the deepening of report content and diversification of formats. Blockchain can not only record financial transaction outcomes but also store rich business context information. This allows financial reports to extend beyond traditional fixed formats and provide more targeted reporting forms according to different users' needs, such as specialized business reports and real-time forecast reports, better satisfying diverse information requirements.

#### **4. Blockchain Application Case Study: Deloitte's Rubix Platform**

In 2014, Deloitte established Rubix in Canada to enhance and streamline client compliance checks, ensure tax collection, and reduce fraud risks. The added value created by the blockchain system can be assessed for its applicability in consumer, supply chain, payment, and contract domains. Based on Rubix, Deloitte developed a global distributed ledger, Deloitte's Perma Rec, integrating it with corporate financial systems (such as SAP, Oracle, Yonyou, etc.) to enhance transparency in corporate purchasing and sales processes.

The application management of blockchain on Deloitte's Rubix platform can be categorized into three types: First, basic information storage, where users can create databases on the blockchain network as proof of existence; Second, more complex authentication applications, where the blockchain network processes intricate logical data, such as binding personal identity information with various applications and transaction data, enabling faster and more efficient data support through the combination of main chains and side chains; Third, transactional applications, such as conducting currency exchanges via the blockchain network, which requires the entire network to execute multiple steps including initiation, verification, transaction, and recording. From an accounting perspective, the successful implementation of all three functions relies on the distributed ledger under blockchain technology.

#### **4.1. Application of the Rubix Platform in Accounting Bookkeeping**

##### **4.1.1. Accounting Recognition.**

In a blockchain network, the core process of accounting recognition can be succinctly described as "individual initiation and collective validation." This mechanism, powered by distributed consensus, ensures the immutability and authenticity of transactions.

Take daily expense reimbursement as an example. Within the Rubix platform, each employee is assigned a unique, cryptographically secured digital identity. When an official expense is incurred, such as for travel, meals, or accommodation, the transaction record is initiated by the employee (the individual) and promptly logged onto the immutable blockchain system with a timestamp.

When submitting a reimbursement claim, the employee is no longer required to provide cumbersome physical tickets or invoices. Authorized managers within the company can directly query this verified consumption information on the ledger using the employee's digital identity, accessing details like time, location, amount, and merchant. This process guarantees that all expenses are genuine and their sources are clearly identifiable, allowing for accurate booking into the corresponding accounting accounts.

This model effectively prevents the submission of false claims and curbs excessive spending by managers. Since every record is "collectively validated" by network consensus and permanently

recorded, it creates a highly transparent data foundation for auditing and oversight, significantly enhancing the efficiency and integrity of corporate financial management.

#### **4.1.2. Accounting Measurement.**

On the Rubix platform, every node maintains a complete and immutable record of the entire transaction history. Each transaction is permanently recorded in a chronological sequence and is transparently accessible for verification at any time. Consequently, all factors influencing accounting measurement within the blockchain network are openly visible and traceable.

This unparalleled data integrity and transparency provide a robust, objective information base for various accounting measurement attributes. These include Historical Cost, Replacement Cost, Net Realizable Value, Present Value, and Fair Value. By offering a single, verifiable source of truth for all transactional data, the platform creates a far more objective and reliable environment for the standardized measurement of financial information. This significantly enhances the credibility, consistency, and comparability of financial statements.

#### **4.1.3. Accounting Recording.**

On the Rubix platform, transaction information is recorded in real-time and is immutable. Whenever a new transaction occurs, it is instantly broadcast across the entire peer-to-peer network. The relevant participating nodes then validate and confirm this transaction through a predefined consensus mechanism.

Once consensus is reached, nodes compete via an algorithm to secure the right to add the transaction to the ledger. The successful node packages the verified transaction, links it cryptographically to the previous block using a timestamp, and thus extends the chronological sequence of transactions. After this process is complete and the transaction is added to the chain, a new block is formed, ensuring the continuity and integrity of the ledger.

All ledgers within the platform are transparent and publicly verifiable. Companies can directly query and audit any historical transaction data, eliminating the sole reliance on traditional physical proofs like contracts and invoices. This mechanism significantly reduces the trust cost among participants and effectively eliminates the possibility of fabricating transactions or creating monetary value, thereby greatly enhancing the trustworthiness and reliability of the business environment.

#### **4.1.4. Accounting Reporting.**

Leveraging the public and transparent nature of financial data on the Rubix platform, automated real-time data disclosure can be achieved. In traditional systems, the process of querying and accessing information is often susceptible to human intervention, leading to delays or selective presentation of data. In contrast, on the Rubix platform, all information exists objectively and immutably, allowing users to extract it on demand at any time, thereby significantly reducing the influence of human manipulation.

The blockchain system also represents substantial progress in the depth and quality of disclosure. Data disclosure in traditional internet environments tends to be fragmented, poorly structured, and of low reliability. On the Rubix platform, however, users, who using their unique digital identities, can decrypt encrypted financial data with their public keys and access comprehensive information recorded on the distributed ledger, which is characterized by high consistency and continuity.

Furthermore, the system assigns differentiated access permissions to each user, ensuring they can only retrieve data within their authorized scope. This mechanism effectively safeguards the right to information for financial statement users while simultaneously protecting the security of corporate financial data. By preventing unauthorized access, it mitigates the risk of information leakage, thereby striking an effective balance between transparency and security.

## **4.2. Application of the Rubix Platform in Tax Declaration**

The Rubix platform, through its component Deloitte's Perma Rec, enables automated tax compliance declaration. The platform collects data from taxpayers and automatically generates tax returns on the blockchain. In addition to a corporate tax identification number, individuals will also have a unique taxpayer identification number that serves as proof of identity. Each transaction is timestamped, recording all tax payments, defaults, and violations in real-time. This mechanism strengthens society's awareness of tax compliance, as those who breach trust will face significant reputational damage.

By leveraging the inherent features of blockchain technology, the platform can prevent common tax evasion practices such as using shadow contracts, issuing fraudulent or understated invoices, and misrepresenting tax categories. This addresses current issues in China's tax management system, including low levels of informatization and an underdeveloped regulatory framework. Ultimately, the Rubix platform helps protect the rights of compliant taxpayers, fosters a fair and just tax environment, and enhances the overall efficiency and transparency of the tax ecosystem.

## **4.3. Application of the Rubix Platform in Cross-Border Payments**

In a blockchain-based cross-border payment system utilizing the Rubix platform, all participating entities, including the originating institution, banks, foreign exchange market makers, and the receiving institution, join the blockchain payment network. Together, they collaboratively build and operate the payment gateway. A key innovation is that transaction initiation and payment settlement occur simultaneously.

This architecture meets the requirement for all involved gateway nodes to collectively maintain the transaction ledger and participate in consensus validation. Consequently, it eliminates the traditionally cumbersome reconciliation processes between banks or financial institutions. Furthermore, the need for intermediary correspondent banks is significantly reduced, which directly lowers transfer costs.

The model enhances the security of cross-border remittances and drastically accelerates both settlement and clearing speeds. Notably, interbank cross-border transfers can be completed in as little as 8 seconds. This represents a highly efficient and streamlined framework for cross-border payments, offering substantial improvements in speed, cost, and security over conventional systems.

## **5. Challenges of Blockchain in the Accounting Industry**

### **5.1. Security Risks**

The security of blockchain is a critical issue that requires special attention. If subjected to hacker attacks, all data on an entire chain could be leaked, leading to substantial losses for users. As of April 2018, there had been 200 major security incidents involving blockchain, resulting in economic losses exceeding \$36 billion. Furthermore, if a single node in the blockchain controls more than 51% of the total network's computing power, the data stored on the blockchain could potentially be tampered with or forged, undermining the trustless premise of the entire blockchain network. Therefore, enhancing the security performance of blockchain is an urgent task.

### **5.2. Technical Limitations**

The application of blockchain in the accounting industry is still in its early stages, and its effectiveness remains somewhat unclear. Concurrently, the current infrastructure is insufficient and not comprehensive enough. Factors such as the shortage of blockchain talent and the relatively slow development of foundational IoT platforms all act as constraints on the large-scale application of blockchain technology. In practical applications, due to a lack of professionals, companies often struggle to promptly master, update, and refine blockchain technology. This may prevent them from achieving the desired outcomes using blockchain, and system operation can be unstable. Additionally,

with the development of the market economy, transactions are frequent, and some involve large scales, complex content, and require high technical efficiency. Due to insufficient technical capability, these transactions cannot be completed swiftly, which limits the broader adoption of the technology.

### **5.3. High Costs**

Applying blockchain to the accounting industry requires developing customized code and setting up corresponding smart contracts tailored to the specific circumstances of each enterprise. Subsequent operation requires technical personnel to continuously handle coding issues based on problems encountered during practical application, leading to high labor costs. The integration of "blockchain in accounting" necessitates substantial hardware support, which itself represents a significant expense, coupled with high maintenance costs in the long run. Each step of applying blockchain in the accounting industry involves considerable financial investment. The high operational costs deter many enterprises, making the current application of blockchain in the accounting industry challenging.

### **5.4. Regulatory and Legal Risks**

Although China's accounting industry, with its three thousand years of development history, has formed a relatively comprehensive legal system, most existing laws and regulations are based on a "centralized" model. One of the biggest innovations of blockchain technology is "decentralization." Therefore, it is particularly urgent and important for the accounting industry to improve laws and regulations adapted to "decentralization" in the face of rapidly evolving and complex blockchain technology. Furthermore, the anonymity and privacy protection features of blockchain technology can be easily exploited by criminals. This demands that the government promptly establish a sound regulatory system to ensure the standardized application of blockchain technology in the accounting industry.

## **6. Summary and Recommendations**

Blockchain technology, as an innovative technology with disruptive potential, is driving transformative development across many industries such as finance, supply chain, and healthcare. Its technical features, decentralization, immutability, and traceability, provide vast opportunities for business model innovation. However, in the traditional and highly regulated field of accounting, the application of blockchain remains in the preliminary exploration stage, facing numerous challenges in practice. Currently, the adoption of blockchain technology within China's business community, particularly in real economy sectors such as manufacturing and retail, remains relatively limited. This phenomenon is constrained by dual factors: from a technical perspective, blockchain currently faces practical issues such as transaction processing efficiency bottlenecks, insufficient system compatibility, and high energy consumption; from an application environment perspective, many traditional enterprises have yet to complete their digital transformation, lacking both interdisciplinary talent with expertise in blockchain technology and accounting, as well as a deep understanding of the operational logic and future development of the digital economy.

To overcome this predicament, multiple stakeholders must join forces to jointly promote the deep integration and application of blockchain technology in the accounting field. Government departments should play a leading role by utilizing policy tools such as formulating industrial development plans, establishing special support funds, and constructing regulatory sandboxes tailored to the characteristics of blockchain. These measures will provide institutional guarantees and legal basis for technological innovation, reduce the cost of trial and error for enterprises, and enhance market entities' confidence in applying blockchain technology. At the enterprise level, there is a need to shift development mindsets, increase investment in research and development, actively engage in industry-academia-research collaboration with universities and research institutions, and focus on overcoming technical challenges related to data security, privacy protection, and system integration in blockchain. Simultaneously, enterprises should explore practical implementation pathways for blockchain in accounting scenarios such as intelligent auditing, real-time accounting, and supply

chain finance. For accounting professionals, it is essential to proactively adapt to technological trends, strengthen their professional foundation, master the basic principles of blockchain and its application skills in accounting practice, and strive to become interdisciplinary talents proficient in both business and technology, thereby providing talent support for industry transformation.

Through the collaborative efforts of multiple stakeholders, including the government, enterprises, professional institutions, and practitioners, blockchain technology is expected to achieve a breakthrough in the accounting field, transitioning from proof of concept to large-scale application. Ultimately, this will lead to the establishment of a more transparent, efficient, and reliable accounting information system, driving the entire industry toward digital and intelligent transformation and upgrading, and pioneering a new era in the development of the accounting industry.

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