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Research on Path of Blockchain Enabling Accounting Information System

Jing Tie

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Abstract

This paper first describes the blockchain technology is the current national support for new technologies, has an important position in the national development strategy ; then, combined with the national accounting development plan, it analyzes the opportunities and challenges faced by the accounting information system and the theoretical basis and advantages of the integration of blockchain technology and accounting information system. Finally, the path of blockchain enabling accounting information system is analyzed.

Index terms— blockchain technology, accounting information system, enabling path.

This paper first describes the blockchain technology is the current national support for new technologies, has an important position in the national development strategy; then, h the national accounting development plan, it analyzes the opportunities and challenges faced by the accounting information system and the theoretical basis and advantages of the integration of blockchain technology and accounting information system. lly, the path of blockchain enabling accounting information system is analyzed blockchain technology, accounting information system, enabling path DDC Code: 332.178 LCC Code: HG1710

1 InformationSystem

Strictly as per the compliance and regulations of:

Introduction lockchain is a new application mode of computer technology such as distributed data storage, point-to-point transmission, consensus mechanism and encryption algorithm. Since the advent of blockchain technology, its development prospects have received great attention. Relevant parties have also invested a lot of research energy and funds here, and its application scope and field are more and more extensive. Blockchain technology is now also gradually applied to accounting information systems. At present, there are many drawbacks in the accounting information system of enterprises, including the problem of information technology, the conservative problem of reporting mode and the lack of supervision. These problems have been greatly alleviated to a certain extent due to the emergence of blockchain technology. There is a natural connection between blockchain technology and accounting, because blockchain technology is a big data ledger, and accounting itself is an economic information conversion technology that specializes in bookkeeping. Therefore, studying the connection between the two has a huge boost to the optimization and progress of accounting information systems. The advocacy and support of the state has greatly promoted the integrated development of blockchain and accounting technology.

At present, the development of accounting information system affected by the new normal economic development, can not meet the requirements of economic development, further development has encountered bottlenecks. The national' 14th Five-Year' accounting development plan puts forward new requirements for accounting information system. The' 14th Five-Year Plan for Accounting Reform and Development (Draft)' has made a new development plan for the development of accounting, including promoting the digital transformation of accounting, accounting management and audit work. One is the digitization of accounting work. Planning pointed out that to design a good transformation of the top-level structure, improve the' enterprise accounting information work norms', to achieve the unity of all enterprises and administrative institutions norms, and to make accounting information is applied to both accounting processes, but also in business activities to use. Establish a data standard including the whole process of accounting information input, processing and output,

2 II. THE ACCOUNTING INFORMATION

46 and apply it to the construction of accounting database of state-owned enterprise financial statements, industry
47 management digital platform and fiscal and taxation sharing platform, so as to effectively accelerate the pace
48 of digital transformation of accounting and auditing, and provide new engines and new advantages for the
49 development of accounting. Second, digital accounting management. The plan puts forward new requirements
50 from the establishment of an integrated management platform for accounting personnel information, credit
51 management, CPA industry information, accounting firms, and agency accounting institutions. It is hoped
52 that through the accounting data standard, the data of each platform will be integrated, and the accounting
53 industry management big data technology will be used to empower the improvement of national governance
54 capabilities; The third is the digitization of audit work. Formulate correspondence data standards, establish a
55 digital platform for correspondence, give play to the functions and roles of modern technology to solve the problem
56 of false correspondence, and improve audit efficiency. Use information technology and means to strengthen the
57 anti-counterfeiting management of audit reports and solve the problem of false audit reports.

58 The 2035 vision for accounting reform and development places new demands on accounting information
59 systems. The country's vision of accounting reform and development clearly states that the dream of an
60 accounting power will be realized by 2035. This requires the improvement of the accounting legal system so
61 that it is consistent with the level of economic development and capital flow at home and abroad; Establish
62 accounting and auditing system standards, and ensure stable operation, significantly expand the right to speak in
63 the formulation of international accounting and auditing standards, achieve high-quality accounting development,
64 and be in a leading position in the world; Gradually optimize the structure of accounting talents, improve the
65 professional ethics, ability level and knowledge level of accounting personnel, so that they can adapt to the identity
66 of China's accounting power; Complete the digital transformation of accounting and auditing, basically solve the
67 problem of accounting trust, ensure the quality of accounting and auditing work, strengthen the accounting service
68 economy and society, and transform to the value chain, so that accounting can play an active role in building a
69 digital China, building a high-standard market system, and improving the ability of national economic governance.
70 In the new normal and new environment of the economy, the accounting information system should adapt to
71 the new needs and new environment, find a breakthrough in the bottleneck that hinders the development, and
72 blockchain technology is an inevitable choice, so this paper studies how the blockchain empowers the accounting
73 information system in order to promote the further development of accounting.

74 2 II. The Accounting Information

75 System Faces Challenges and Opportunities

76 a) The problems existing in the accounting information system Centralized mode The current accounting mode
77 still adopts centralized mode, such as financial service sharing center and cloud mode. The model of accounting
78 center has many disadvantages. All accounting information is centralized in the center, tampering cost is low,
79 trustworthiness is questioned; All accounting information is concentrated in the center, poor transparency and
80 openness, easy to be subjected to hackers and other network attacks, information theft, disclosure and other high
81 risks, there are security risks; Fewer people participate in accounting data processing, it is difficult to play the
82 collective wisdom, wisdom finance is difficult to develop; Financial report is only a fixed balance sheet, income
83 statement, cash flow statement, difficult to meet the needs of various parties, the degree of information sharing
84 is not high.

85 In the current accounting information system, the financial department and the business department are
86 still separated obviously, and the integration is not high. Nowadays, information technology is developed and
87 information exchange is convenient. However, the lack of professional information exchange platform and the
88 lack of awareness of the integration of business departments and financial departments lead to the obstruction
89 of information sharing and communication. The cross-departmental business ability of financial personnel and
90 business personnel needs to be improved. Financial personnel do not understand business, business personnel do
91 not understand finance, and the knowledge and business skills of staff need to be transformed and upgraded. The
92 enterprise management system is not perfect, the evaluation system is defective, the business department and
93 the financial department only consider the problem from their own perspective, the business only considers the
94 increase of performance and sales, does not consider the financial risk, the financial only considers the control of
95 risk, does not consider the increase of business performance, these problems are not conducive to the integration
96 of industry and finance.

97 There are many problems in the development of accounting. Compared with the needs of economic and social
98 development, there are still gaps in the construction of accounting auditing standard system. Compared with the
99 requirements of the reform of "release regulation and service", the management of accounting service market still
100 needs innovation; Compared with the construction of a high standard market system, the quality of accounting
101 audit work still needs to be improved; Compared with the requirements of high quality development, the supply
102 of high-end accounting talents is still insufficient; Compared with the comprehensive rule of law requirements,
103 accounting rule of law construction still needs to be strengthened; Compared with the requirement of digital
104 development, the informatization level of accounting audit work still needs to be improved. These problems
105 need to be solved by institutional innovation, institutional optimization and institutional reform during the 14th
106 Five-Year Plan period. During the "14th Five-Year Plan" period, accounting, as a foundational work in the

107 macroeconomic management and allocation of market resources, faces rare development opportunities in the
108 course of deepening reform comprehensively and integrating deeply into economic globalization in our country.

109 Opportunities and challenges brought by the new international situation From the international perspective,
110 the international situation is undergoing profound and complex changes, will profoundly affect the existing
111 international accounting order; International economic and trade exchanges and cross-border capital flows have
112 raised new requirements for crossborder accounting, auditing cooperation and supervision; New business models
113 emerge in endlessly in economic development, which will profoundly affect the development trend of accounting
114 standards. From the domestic point of view, in the steady and slow economic operation situation, accounting
115 audit illegal behavior has a trend of rising, capital market financial fraud cases, causing widespread concern from
116 all walks of life; With the development of science and technology and the wide application of new technology,
117 accounting challenges and opportunities coexist.

118 In the face of these new situations, new problems, new challenges and new opportunities, it is required
119 that the accounting law and accounting standards are constantly perfected and effectively implemented, that
120 the accounting practitioners continue to improve their quality, accelerate their transformation, and that the
121 accounting management departments continue to change their ideas and improve their methods.

122 **3 a) The macro environment of integration**

123 In December 2016, The State Council issued the 13th Five-Year National Informatization Plan, which for the
124 first time included blockchain technology as a strategic technology in the plan. The plan emphasizes the strategic
125 layout of basic R&D and frontier of new technologies such as blockchain. In March 2021, the "14th Five-
126 Year" National Informatization Plan is being formulated to promote the implementation of the plan from nine
127 aspects such as information infrastructure construction and the deep integration of digital technology and the real
128 economy. The decentralized point-to-point value delivery transaction mode of blockchain technology is a natural
129 digital technology, and accounting is an effective tool to calculate digital value. The two have a natural basis for
130 integration. The strategic layout of the country also provides a good macro environment for the integration of
131 blockchain and accounting.

132 **4 b) The theoretical basis of integration**

133 First of all, accounting is a technology that processes the procurement, production, inventory and sales business
134 information of an enterprise into value information with professional accounting technology. It is a professional
135 business processing information technology and belongs to the information category. Blockchain is an information
136 technology that processes all economic information in accordance with the contract and consensus mechanism.
137 It also belongs to the information category, so accounting and blockchain both have the attributes of information
138 and information technology. Secondly, blockchain solidifies and stores all transaction information with timestamp
139 and asymmetric encryption algorithm to preserve information completely and accurately and ensure authenticity.
140 The goal of accounting is to confirm, measure and report the actual transactions or matters, truthfully reflect
141 the various accounting elements and other relevant information that meet the requirements of recognition and
142 measurement, and ensure that the accounting information is true and reliable and the content is complete.
143 Therefore, they are consistent in attribute and target, which provides a theoretical basis for fusion.

144 **5 c) Advantages of integration**

145 "Blockchain + Accounting" will improve the quality of accounting information Blockchain technology can optimize
146 the path of accounting information generation and improve the quality of accounting information. At present,
147 Kingdee, Yonyou and other accounting software have designed a set of automatic accounting system according
148 to the principle of doubleentry bookkeeping and the process of confirmation, measurement, bookkeeping and
149 reporting: The cashier will input the information of fund receipt and payment into the system based on invoices,
150 bank payment slips, bank receipts, expense claims, etc., and the system will automatically register the cash
151 journal and bank deposit journal according to the procedures designed by the system. The accountant will
152 input the purchase invoice, sales invoice, production document, inventory document and expense document
153 into the system manually, and the system will automatically register all kinds of subsidiary ledger and general
154 ledger according to the designed process. The statement system will issue three major statements (balance sheet,
155 income statement and cash flow statement) according to the designed statement template. Therefore, the current
156 accounting information system is only the man-machine collaboration mode, rather than the machine mode and
157 artificial intelligence mode of blockchain technology. The former can still be tampered with according to human
158 intervention methods such as replication, deletion, recovery of bookkeeping and cancellation of bookkeeping, and
159 the general ledger type of centralized mode is extremely easy to tamper with, which brings great challenges to the
160 reliability of accounting information. However, blockchain uses the value Internet technology which is completely
161 different from the information Internet technology. It is the transmission of value rather than the replication of
162 information, so tampering is bound to leave traces. In addition, blockchain records all the information of each
163 transaction through the time stamp and consensus mechanism. According to the time sequence, it can not only
164 trace forward, but also continuously extend backward, which makes it technically difficult to modify and steal
165 data and other tampering behaviors, so as to ensure the integrity and authenticity of information technically.

8 THE PATH OF ACCOUNTING INFORMATION SYSTEM ENABLED BY BLOCKCHAIN A) INFORMATION FIDELITY

166 "Blockchain + Accounting" will improve the intelligent level of accounting treatment. The recording and
167 verification of accounting information under blockchain will be automatically completed by a pre-set computer
168 program, which improves the intelligent level of accounting treatment. Kingdee, ufile software standalone mode,
169 financial Shared schema or cloud model, on the business process, in the accounting process, all need audit
170 personnel to check the information and check, this is human-machine collaborative mode, is not completely
171 machines, automation, prone to error, the manipulation of information as well as the low efficiency and so on.
172 And block chain accounting information system, through the embedded intelligent contract (by the financial
173 contracts, supply, supervision, auditing, production and sales contracts, etc), contract layer embedded code,
174 when the business to the expected contract rule conditions and check, the system will automatically perform
175 significantly improve the processing efficiency and accuracy of accounting information system.

176 Block type chain would promote accounting accounting information system to intelligent accounting informa-
177 tion system accounting information system, only the computer outside accounting into the computer,
178 through the technique of artificial scans or entry input source documents, each business in the accounting software
179 to the original credentials in accordance with the accounting theory is processed into accounting information,
180 Through the establishment of a good accounting system to automatically complete the subsequent accounting
181 processing, such as the registration of detailed accounts, issuing accounting statements, etc. Computer in the
182 transmission, inquiry, sorting out accounting data, processing efficiency has been greatly improved, to a certain
183 extent, improve the level of accounting information, but there is still a big gap with the management accounting
184 goals. The objectives of management accounting include strategic accounting, intelligent accounting and
185 intelligent accounting. The transformation and upgrading of financial accounting into management accounting
186 cannot be done without the help of blockchain.

187 6 IV.

188 7 Opportunities and Challenges

189 Brought by Blockchain to Accounting Information System The accounting information system has shortcomings
190 such as information island, information lag, centralization and separation of industry and finance, and the
191 enabling of blockchain can fundamentally improve or even eliminate these shortcomings. The whole process
192 of blockchain is open and transparent, resistant to tampering and self-trust, which can meet the requirements
193 of obtaining authentic and reliable original vouchers of accounting information system, and also meet the
194 new requirements of economic development on the acquisition automation of accounting information system.
195 Blockchain decentralization and distributed accounting can solve the requirements of intelligent accounting
196 voucher preparation, and solve the problem of information lag; The advantages of blockchain traceability and
197 easy accountability can easily solve the problems and requirements of accounting information system book
198 registration automation; The advantages of financial integration and synchronization of blockchain business and
199 timely information sharing bring opportunities to break through the bottleneck of accounting reports, which can
200 meet the new requirements of current economic development and solve the shortcomings of separation of industry
201 and finance and insufficient integration. Of course, the application of blockchain technology in accounting also
202 has certain challenges. Blockchain technology itself is immature, application scenarios are limited, it cannot solve
203 the problem of offchain data security, the digitalization of financial business needs to use other technologies, and
204 the data on-chain is not sufficient.

205 V.

206 8 The Path of Accounting Information System Enabled by 207 Blockchain a) Information fidelity

208 The trust of accounting information system ensures that the characteristics of blockchain technology, such as
209 decentralization, distributed bookkeeping and resistance to tampering, coincide with the requirements of true
210 and reliable accounting information, and can fully guarantee the authenticity of accounting information. However,
211 computer hardware and software technology insufficiency, system related parties, malicious hackers and so on
212 have brought great security risks to the accounting information system. In addition, the current financial sharing
213 service center and cloud accounting mode are both centralized processing methods, with low tampering cost,
214 which is a big problem for accounting information system to provide true and reliable information. Therefore,
215 the embedding of multi-node two-layer blockchain technology and the construction and operation of the vertical
216 and horizontal bidirectional degree model can play the role of firewall and booster, and promote the construction
217 of the credit guarantee mechanism of accounting information system. In addition, blockchain plays a role
218 in solidifying the original transaction information and the accounting processing process. Making full use of
219 blockchain technology to process accounting data and using artificial intelligence mode will enable the information
220 fidelity of accounting information system.

221 In terms of ensuring the fidelity of accounting information, blockchain can achieve dissemination fidelity and
222 a certain degree of release fidelity in general application scenarios; In the field of audit, a scheme to improve the
223 quality of accounting information can be constructed, which can protect the privacy of reasonable accounting

224 information, detect false participants, eliminate unnecessary human influence and avoid bias in audit reports, so
225 as to provide a more powerful guarantee for the fidelity of information.

226 The application of blockchain technology can optimize the accounting information system. For example, in
227 the purchase and sale business, the information process can be reconstructed from internal and external aspects,
228 and then the optimization of its security, information risk and other aspects under the blockchain technology
229 can be deeply discussed. In particular, environmental accounting is severely restricted by the bottleneck of
230 technology, reporting mode and supervision mechanism, and the integration of blockchain technology will break
231 the bottleneck and promote the further optimization and development of environmental accounting information
232 system.

233 9 b) Information sharing

234 Accounting information system of the intelligent block distributed record and store chain, each node record all
235 transactions in chronological order, the relationship between all nodes are equal, open and transparent operation
236 rules, abide by the same consensus algorithm trading rules, the point-to-point connections, jointly safeguard, the
237 trust, information sharing, intelligence, wisdom, for the accounting information system laid a foundation. Because
238 of the self-trust, all users on the chain give full play to the wisdom of free trade, innovation of production mode,
239 change the production relationship, each enterprise to optimize the accounting information system, and business
240 integration, the whole economy will be a great wisdom of the accounting information system. No matter which
241 industry, to achieve a high degree of information sharing, we can analyze the advantages and disadvantages of
242 the company's accounting system and business system, and then explain how to integrate the information system
243 process and business process through process optimization and transformation, so as to achieve the purpose of
244 wisdom.

245 Blockchain technology can promote the optimization of accounting information system. For example, the
246 enterprise procurement system can analyze the optimization application value of blockchain technology in financial
247 accounting and management accounting by constructing the procurement activity accounting model. According to
248 the analysis results, the procurement system can be taken as the entry point to play a role in system optimization.
249 In terms of optimizing accounting supervision, first of all, it is necessary to analyze the necessity of building
250 a blockchain accounting supervision system. Then, according to the characteristics of business processes, it is
251 necessary to analyze how blockchain can help standardize the supervision process, optimize accounting supervision
252 and play a role in optimizing the system.

253 10 c) Application of information

254 Value creation of accounting information system Accounting information system has the disadvantage of infor-
255 mation island, while blockchain technology enables accounting information sharing, openness and transparency,
256 facilitates the operation and use of accounting information, and creates value from it. Block chain is combined
257 with "big, smart, mobile, cloud, things" and other technologies to build a blockchain management accounting
258 digital skills ecosystem, making it possible for management accounting to build a value creation platform for
259 enterprises. From the perspective of intelligent management accounting, the technology of "big, smart, mobile,
260 cloud, material" can also be used to transform the accounting information system into an intelligent financial
261 sharing platform, so as to provide real-time useful information for all parties with information needs, predict
262 risks, and realize the value creation of accounting information. The management accounting report system is
263 constructed through the technology of physical layer, definition layer, network layer, collaboration layer and
264 application layer of blockchain, so that the function of management accounting to create value by information
265 becomes a reality. Moreover, the management accounting information system based on the core technology of
266 blockchain, including data physical layer, data definition layer, data storage layer, data processing layer, data link
267 layer and data application layer, can make the management accounting information information and promote
268 the accounting information system to create value.

269 The application of blockchain technology in the value creation of accounting information, referring to the
270 practice of Deloitte Rubix platform in the operation process of cross-border payment, accounting, data storage
271 and business audit, can analyze how to deal with challenges and opportunities through SWOT matrix analysis
272 model, in order to better play the role of this platform. Blockchain has been applied in strategic management
273 accounting and has made some breakthroughs. For example, the use of blockchain to establish the framework of
274 management accounting tools, from the application target, application platform, application evaluation system
275 to form a systematic and integrated system application of management accounting tools, can promote the value
276 creation of accounting information system. The application of blockchain technology in the preparation of
277 management accounting report is also practical and feasible. As long as it is feasible in theory and reality, the
278 application of blockchain technology in the preparation of management accounting report is within reach.

279 **11 VI.**

280 **12 Conclusion**

281 Blockchain technology is a very hot technology in today's society, and its application in the accounting
282 industry has also attracted wide attention. More and more scholars have begun to study the application of
283 blockchain technology in the accounting field. Its advantage is to establish distributed ledger, improve the
284 quality of accounting information, strengthen enterprise supervision and management, so as to promote the
285 optimization of enterprise accounting management information system. To sum up, with constant innovation
286 and development block chain technology, in the future the technology will be increasingly perfect and mature,
287 it will give the accounting field brings a huge innovation, so as to promote its transformation, promote
288 reform and innovation of accounting management information system, improve the enterprise's management
289 method, management, operation mode, makes in the chain of blocks technical background, Enterprise accounting
290 management information system has been further optimized and improved.

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