REVIEW

by Doctor of Economic Sciences, Associate Professor,
Professor of the Department of Accounting and Taxation
of West Ukrainian National University
Oleg Shevchuk
on the dissertation
by Chengyu Liu entitled: "Accounting using blockchain technology", submitted for the degree of Doctor of Philosophy in specialty 071 "Accounting and Taxation" within the field of knowledge 07 "Management and Administration"

Relevance of the Research Topic

The active implementation of digital technologies in the economic environment necessitates a rethinking of fundamental approaches to the processing, storage, and use of accounting information. Among modern information and communication technologies, blockchain occupies a special place, gradually transforming into a fundamental tool for organizing accounting processes. The principles of blockchain technology: decentralization, cryptographic protection, data immutability, transparency, and automated verification - create the foundation for shaping a new accounting paradigm.

The application of blockchain technology enables the creation of digital accounting systems with minimal human intervention, which increases the reliability and timeliness of accounting information. This is especially crucial in the context of e-business, where speed of data exchange, cybersecurity, relevance, and automated analytics are key factors. Furthermore, blockchain opens new opportunities for accounting of cryptographic assets, which are actively used in modern business models of the digital economy.

In the context of the transformational processes taking place in the field of accounting under the influence of blockchain technologies, the importance of scientific research aimed at adapting the theoretical and methodological principles of accounting to the new digital conditions is growing. Studying the mechanisms of blockchain's impact on accounting organization, methodology, and tools is relevant both from a scientific and a practical point of view. In this context, the topic of Liu Chengyu dissertation gains both scientific and applied significance, as it aims to develop an innovative accounting system that meets the challenges of the digital economy.

Relation to Scientific Programs, Plans, and Topics

The dissertation research was carried out in accordance with the research plans of the Department of Accounting and Taxation at West Ukrainian National University within the framework of the scientific project “Digitalization of Accounting to Ensure Economic and Cybersecurity of the Enterprise” (state registration number 0125U001067). Within this project, the author improved the methodology of accounting in the context of using blockchain technology.

Personal Contribution of the Applicant to the Obtained Scientific Results

The dissertation is the result of independent scientific research in which the applicant has deepened and improved the theoretical and methodological foundations, as well as proposed practical recommendations for improving accounting practices considering the capabilities of blockchain technology. The author is responsible for the scientific ideas, theoretical generalizations, justification of research methods, formulated conclusions, and developed practical recommendations. Her personal contribution to co-authored scientific publications is clearly outlined in the list of academic works. The dissertation is based solely on the author’s original developments. The scope and content of the applicant’s individual contribution are sufficient for a dissertation at this academic level.

Validity of Scientific Provisions, Conclusions and Recommendations

The dissertation research is characterized by a logical structure, scientific soundness, and a high level of credibility of the formulated propositions and recommendations. The reliability of the conclusions presented in the study is ensured by the use of diverse and reputable information sources, which allowed for in-depth exploration of the research topic. The involvement of an extensive information base served as an important tool for testing scientific hypotheses and solving the practical tasks of the study.

The stated objective is fully aligned with the topic of the dissertation, and the object and subject of the study are adequately represented in its content. The evidence and scientific accuracy of the main results, propositions, and recommendations are

confirmed by a significant number of the applicant's publications in professional academic journals, as well as her active participation in international and national scientific-practical conferences. The published works demonstrate the author's significant personal contribution to addressing relevant theoretical and applied issues in the development of accounting under the influence of blockchain technology.

Thus, the content of the study fully corresponds to its title, aim, and defined objectives. The main scientific results are presented consistently and persuasively; the conclusions and practical proposals are based on the applicant's own research, which has undergone testing and is supported by a reliable source base.

Degree of Scientific Novelty of the Dissertation Research Results

The most significant results that confirm the personal contribution of the applicant to the development of the researched problem and define the scientific novelty of her work are presented as an integrated system of interrelated theoretical provisions and practical proposals. An analysis of the content of Liu Chengyu's dissertation and her main scientific publications made it possible to identify key theoretical and methodological developments, conclusions, and recommendations that demonstrate the novelty of approaches and confirm the author's contribution to solving the scientific task of substantiating conceptual foundations and practical guidelines for improving accounting under the conditions of blockchain technology application.

Within the framework of the research goal, which was to identify the potential of blockchain technology for processing accounting information in order to enhance the efficiency of accounting methodology and organization in the digital economy, the applicant defined a set of scientific and applied tasks. Their resolution made it possible to obtain results that possess both scientific novelty and practical value, reflected in the author's provisions, conclusions, and recommendations.

The achievement of the set tasks was made possible through the application of modern scientific and methodological tools that ensured proper theoretical justification of the research results and proved their suitability for further scientific use and practical implementation.

Among the scientific results aimed at improving theoretical and methodological foundations and developing applied recommendations for modernizing accounting in the conditions of blockchain technology use, the following should be highlighted:

1. A classification of blockchain data structuring technology into public, consortium, and private blockchains was carried out, and the significance of their use in accounting was determined, including secure data storage, fraud prevention, and decentralized interaction (p. 47);

2. The impact of blockchain technologies on accounting methodology was assessed, including the recognition of various types of electronic (virtual) money as accounting objects, their monetary valuation by different methods, variable representation in accounting accounts, and detailed periodization in the formation of internal and external reporting (p. 78);

3. Prospects for integrating blockchain technology with cloud services for processing accounting information were investigated to decentralize accounting as a more effective organizational form of enterprise functioning. It was proven that the decentralized and secure nature of blockchain eliminates the limitations of traditional cloud accounting systems, providing a more reliable mechanism for preserving accounting data (p. 99);

4. The use of the DuPont model for analyzing the efficiency of blockchain application in accounting was further developed based on determining the profitability of net income, total asset turnover, and equity multiplier, demonstrating a positive effect of digitalizing accounting information processing on medium and large enterprises by simplifying and enhancing the efficiency of accounting operations (p. 165);

Completeness of Publication of the Main Provisions of the Dissertation

Liu Chengyu's dissertation is an independent, comprehensive, and full-fledged scientific work. The main provisions of the dissertation are presented in 8 scientific works, including 4 scientific publications reflecting the main scientific results, among which is an article in a scientific periodical indexed in the Web of Science and Scopus databases (Q1 quartile), 3 articles in specialized scientific publications of Ukraine; and

4 additional scientific publications reflecting further scientific results of the dissertation. The total volume of published works is 5.2 author's sheets, with 2.8 author's sheets belonging personally to the author, including: scientific works highlighting the main results of scientific research on the dissertation topic – 2 author's sheets; scientific works additionally reflecting scientific results of the dissertation – 0.8 author's sheets.

The main results of the dissertation research, which constitute scientific novelty, were presented and received scientific discussion during four international and national scientific-practical conferences. The presented dissertation is the result of the applicant's individual research efforts, who independently formed conceptual approaches, methodological foundations, and proposed applied solutions for modernizing the accounting system under the conditions of blockchain technology implementation. All ideas, generalizations, analytical conclusions, and practical proposals submitted for defense are the result of the author's personal scientific activity and have been reflected in her scientific publications.

Theoretical and Practical Significance of the Obtained Results and Recommendations on Their Use

The results of Liu Chengyu's dissertation research have significant theoretical value as they deepen scientific understanding of the possibilities of transforming accounting in the context of the digital economy. Within the first chapter of the dissertation, the conceptual and categorical apparatus related to the digitalization of the economy and the role of information technologies in the accounting system was clarified, and conceptual approaches to positioning blockchain technology in the accounting process were outlined. This ensured the formation of a scientifically grounded basis for further applied developments in accounting methodology.

The second chapter substantiated methodological provisions revealing the impact of blockchain technology on organizational and informational aspects of accounting. In particular, approaches to maintaining electronic accounting documents, storing and processing information in cloud environments using blockchain, and developing electronic communication based on this technology were formulated. This allows the

formation of a new accounting methodology based on the principles of decentralization, transparency, and immutability of data.

The third chapter of the dissertation proposed practical recommendations for improving the accounting of electronic money, cryptocurrencies, and settlements with counterparties considering the functional capabilities of blockchain technologies. Particular attention was paid to assessing the effectiveness of blockchain implementation in accounting practice, enabling informed managerial decisions regarding investments in the digital infrastructure of enterprises.

The practical significance of the obtained results also lies in their applicability in the activities of business entities implementing modern digital technologies, as well as in the educational process of higher education institutions for training specialists in accounting, auditing, and financial control. The applicant's recommendations can be useful for accountants, auditors, IT specialists, and managers seeking to adapt accounting systems to the requirements of the digital environment.

Thus, the results of the dissertation research have both fundamental theoretical significance for the further development of science and practical value for improving accounting practices in the context of digital transformation.

Evaluation of the Dissertation Structure, Language, and Style

Liu Chengyu's dissertation is characterized by a well-thought-out structure, internal consistency, and substantive completeness. The sequence of material presentation in the chapters ensures a logical development of the research, facilitates a holistic understanding of the research subject, and allows tracing the applicant's contribution to solving the scientific problem. Each chapter logically complements the previous one, making it possible to clearly follow how the set goals and objectives are implemented in accordance with the chosen topic. The structure and content of the dissertation comply with established academic standards and are formatted according to the requirements approved by the Order of the Ministry of Education and Science of Ukraine dated January 12, 2017, No. 40 "On Approval of the Requirements for Dissertation Formatting."

The dissertation consists of an introduction, three chapters of the main text, conclusions, a list of references, and appendices. The total volume of the dissertation is 212 pages of text. The dissertation text includes 19 tables, 22 figures, and 5 appendices. The list of references comprises 240 titles.

Liu Chengyu's dissertation is prepared in business English, based on general scientific and economic terminology. The writing style is scientific due to the logical sequence of content disclosure in paragraphs and chapters of the dissertation, unambiguous interpretation of definitions and categories, semantic interrelation of tasks, scientific novelty, final provisions and conclusions, objectivity of comparison of conducted scientific research, and the formation of the author's position in the field of accounting, etc.

Comments and Suggestions on the Dissertation

Alongside significant scientific results, high quality of content, and proper formatting, it is advisable to pay attention to certain remarks and discussion points that deserve further clarification or discussion. The most significant among them include:

1. When building an accounting system for electronic settlements based on the use of electronic contracts, it is advisable to pay attention to potential legal issues that may arise from using electronic contracts and smart contracts. It is also important to specify how exactly this system will impact the efficiency of managing accounts receivable and payable in the real conditions of a changing environment, as well as what economic benefits it may bring;
2. Considering the variety of cryptocurrencies, it is necessary to substantiate how all features and characteristics of electronic and cryptographic monetary assets should be accounted for in accounting policies to create a quality informational, instructional, and regulatory framework for an effective management system;
3. It would be advisable to consider in more detail the methodology for forming integrated reporting on electronic money and cryptocurrencies, particularly in explaining mechanisms for combining financial and non-financial indicators, methods of visualizing accounting information, and methods for transforming reporting forms for simultaneous demonstration to different stakeholder groups;

4. To increase the reliability and efficiency of electronic document management in enterprises, the author proposed using blockchain technologies. An option for optimizing software for managing electronic document flow via the Rubik platform was identified. However, this proposal would have more practical significance if the author considered the interrelation of business processes, electronic document flow structure, and cryptographic algorithms to ensure data integration;

5. For a fuller disclosure of the content of the third chapter, it would be appropriate to more deeply assess the impact of accounting digitalization on the overall concept of improving methodological approaches, which would better substantiate the feasibility and effectiveness of the proposed transformations.

The above comments and suggestions do not diminish the positive evaluation of the dissertation.

Overall Evaluation of the Work and Its Compliance with Established Requirements

Liu Chengyu's dissertation entitled "Accounting in the Context of Blockchain Technology Application," submitted for the degree of Doctor of Philosophy, is an independent, complete scientific study containing conceptually new, scientifically substantiated theoretical approaches and practical solutions regarding the transformation of accounting considering the capabilities of blockchain technology. The results presented in the work, proposed approaches, conclusions, and recommendations are distinguished by scientific novelty, methodological clarity, and practical significance. The dissertation is performed at a proper professional level, fully corresponds to the research topic, and its objectives have been successfully achieved.

Considering the relevance of the addressed problem, the scientific novelty of the obtained results, their theoretical significance and applied orientation, as well as compliance with the structure, style, and language of presentation, Liu Chengyu's dissertation meets the requirements defined by the Procedure for Awarding the Degree of Doctor of Philosophy and the Cancellation of the Decision of the Single Specialized Academic Council of the Higher Education Institution or Research Institution on Awarding the Degree of Doctor of Philosophy, approved by the Cabinet of Ministers

of Ukraine on January 12, 2022, No. 44, and the Order of the Ministry of Education and Science of Ukraine "On Approval of the Requirements for Dissertation Formatting" No. 40 dated January 12, 2017.

Therefore, the author of the dissertation, Liu Chengyu, deserves to be awarded the degree of Doctor of Philosophy in the specialty 071 "Accounting and Taxation" within the field of knowledge 07 "Management and Administration."

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Підпис Шевчука
Завіряю:
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