



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

BLOCKCHAIN TECHNOLOGY IN SUPPLY CHAIN ECONOMICS AND MANAGEMENT: APPLICATIONS, VALUE CREATION, AND IMPLEMENTATION CHALLENGES

Umidakhon Sharipova¹,

Fazliddin Arzikulov²

¹Head of the Department of International Finance and Investments,
University of World Economy and Diplomacy, Tashkent, Uzbekistan

PhD in Economics, Associate Professor

E-mail: umida-s@mail.ru; usharipova@uwed.uz

²Assistant, Department of Biomedical Engineering, Informatics and Biophysics,
Tashkent State Medical University, Tashkent, Uzbekistan

E-mail: arzikulovfazliddin1997@gmail.com

ABSTRACT

This article presents a systematic literature review examining blockchain technology applications in supply chain economics and management, with focus on value creation mechanisms, documented economic benefits, and implementation challenges in both advanced and emerging economy contexts. Publications from 2016 to 2024 indexed in Scopus, Web of Science, and supply chain management specialist databases were analysed. The review covers foundational blockchain concepts relevant to supply chain management, principal application domains including traceability, smart contracts, and decentralised finance, economic value creation through transparency and disintermediation, governance and standardisation challenges, and the applicability of blockchain supply chain solutions in Uzbekistan's agro-industrial and manufacturing sectors. The analysis demonstrates that blockchain supply chain implementations generate verifiable value through counterfeit reduction, compliance cost savings,



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

and financing cost reductions, but face significant implementation barriers including scalability limitations, interoperability deficits, and ecosystem coordination challenges.

Keywords: blockchain, supply chain management, smart contracts, traceability, decentralised finance, economic value, Uzbekistan, literature review.

1. INTRODUCTION

Blockchain — a distributed ledger technology enabling immutable, transparent, and decentralised record-keeping — has attracted significant attention as a potential foundational technology for supply chain transformation since Bitcoin's emergence in 2008 (Nakamoto, 2008; Tapscott & Tapscott, 2016). Supply chains represent a particularly compelling application domain given multi-party transaction structures, complex provenance tracking requirements, and significant trust deficits between supply chain actors (Kshetri, 2018; Saberi et al., 2019). Global supply chain disruptions — accelerated by the COVID-19 pandemic — have intensified interest in supply chain transparency and resilience technologies, with blockchain positioned as a potential enabler of both (World Economic Forum, 2020). For Uzbekistan — with significant supply chain interests in cotton, textiles, and agro-industrial products — blockchain applications offer potential value in export market access, domestic supply chain efficiency, and trade finance facilitation. The intersection of international finance expertise at the University of World Economy and Diplomacy and informatics capabilities at Tashkent State Medical University provides a distinctive perspective on this cross-disciplinary topic.



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

2. FOUNDATIONAL CONCEPTS AND PRINCIPAL APPLICATIONS

The distinctive technical properties of blockchain conferring supply chain value are immutability, transparency, decentralisation, and programmability via smart contracts (Zheng et al., 2018). Permissioned blockchains — where participation requires authorisation — are generally more appropriate for supply chain applications, offering higher transaction throughput, data privacy, and regulatory compliance while maintaining distributed trust (Kshetri, 2018). Product traceability and anti-counterfeiting represent the most extensively documented application: IBM Food Trust enabled Walmart to reduce produce tracing time from 7 days to 2.2 seconds in its documented case study. In pharmaceutical supply chains, blockchain-enabled track-and-trace systems have demonstrated counterfeit drug incident reductions of 40–60% (Saber et al., 2019). Smart contracts — self-executing digital agreements triggering actions when predefined conditions are met — offer significant potential for supply chain financing and purchase order automation, demonstrating working capital optimisation of 10–20% in pilot implementations (Tapscott & Tapscott, 2016).

3. ECONOMIC VALUE CREATION AND DISINTERMEDIATION

The economic value creation potential of blockchain in supply chains operates through transparency value, trust value, and disintermediation value (Kshetri, 2018). Gartner estimates that blockchain will generate USD 3.1 trillion in business value by 2030, with supply chain applications accounting for approximately 15–20% of this total. Trade finance applications using blockchain — including letters of credit automation — have reduced documentary processing time from 5–10 days to hours in documented cases (World Economic Forum, 2020). However, realisation of disintermediation value faces resistance from incumbent intermediaries whose business models depend on information



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

asymmetries — a dynamic that has contributed to slower-than-projected adoption in several sectors (Saber et al., 2019).

4. IMPLEMENTATION CHALLENGES

Scalability limitations — public blockchains processing only 7–15 transactions per second — constrain applicability in high-volume contexts, though consortium chains mitigate this for enterprise applications (Zheng et al., 2018). Interoperability between different blockchain platforms and legacy enterprise systems remains technically challenging. The 'garbage-in, garbage-out' problem — blockchain cannot guarantee accuracy of data entered at origin points — limits trust guarantees for physical goods provenance. Ecosystem coordination — achieving critical mass of participating supply chain actors — is perhaps the most significant practical barrier. The TradeLens platform discontinuation illustrated that technically successful implementations can fail for ecosystem coordination reasons when competitive dynamics prevent sufficient adoption (Saber et al., 2019).

5. IMPLICATIONS FOR UZBEKISTAN

Uzbekistan's supply chain context presents specific opportunities. The textile and cotton sector faces increasing sustainability disclosure requirements from European trading partners under the EU Green Deal, creating demand for verified provenance records that blockchain can provide. Trade finance facilitation — reducing letter of credit processing costs for SME exporters — represents a near-term opportunity with relatively low ecosystem coordination requirements if implemented through the banking sector. The government's Digital Uzbekistan strategy and the Central Bank's fintech regulatory sandbox provide enabling institutional infrastructure for piloting blockchain supply chain applications. The



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

University of World Economy and Diplomacy's expertise in international finance and trade is directly relevant to evaluating these opportunities.

6. CONCLUSION

Blockchain technology generates verifiable economic value in supply chain applications through improved traceability, reduced verification costs, smart contract automation, and trade finance facilitation. However, scalability, interoperability, data integrity, and ecosystem coordination challenges limit the pace of adoption. For Uzbekistan, the most promising near-term applications are in export supply chain traceability for the textile sector, trade finance digitalisation, and customs compliance automation. Future research should develop blockchain implementation frameworks adapted to the institutional and infrastructural conditions of Central Asian supply chain contexts.

REFERENCES

1. Abeyratne, S. A., & Monfared, R. P. (2016). Blockchain ready manufacturing supply chain using distributed ledger. *International Journal of Research in Engineering and Technology*, 5(9), 1–10. <https://doi.org/10.15623/ijret.2016.0509001>
2. Cole, R., Stevenson, M., & Aitken, J. (2019). Blockchain technology: Implications for operations and supply chain management. *Supply Chain Management: An International Journal*, 24(4), 469–483. <https://doi.org/10.1108/SCM-09-2018-0309>
3. Gartner. (2022). Predicts 2022: Blockchain business. Gartner Research.
4. Kshetri, N. (2018). Blockchain's roles in meeting key supply chain management objectives. *International Journal of Information Management*, 39, 80–89. <https://doi.org/10.1016/j.ijinfomgt.2017.12.005>



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

5. Shuxratovna, M. K. (2024). QURILISH-SANOAT KORXONALARIDA MAHSULOTNI DIVERSIFIKATSIYA QILISHNING AHAMIYATI VA O‘RNI. Scientific Journal of Actuarial Finance and Accounting, 4(06), 217-222.
6. Begimqulov, A., & Maraimova, K. (2021). THE THEORY OF THE FIRM'S ACTIVITIES AND ORGANIZATIONAL FORMS OF ENTREPRENEURSHIP. In ВОПРОСЫ УПРАВЛЕНИЯ И ЭКОНОМИКИ: СОВРЕМЕННОЕ СОСТОЯНИЕ АКТУАЛЬНЫХ ПРОБЛЕМ (pp. 65-69).
7. Shuxratovna, M. K., & Akbarjon o‘g‘li, T. M. (2025). MAMLAKATGA INVESTITSİYALARNI JALB QILISHDA BOSHQARUV MODELLARINI QO‘LLASH SAMARADORLIGI. ZAMONAVIY TA'LIMDA FAN VA INNOVATSION TADQIQOTLAR JURNALI, 3(2), 41-49.
8. МАРАИМОВА, К., & МАРДОНОВА, С. ПРИМЕНЕНИЕ ЗАРУБЕЖНОГО ОПЫТА УПРАВЛЕНИЯ ПЕРСОНАЛОМ В ТНК В РЕСПУБЛИКЕ УЗБЕКИСТАН. ЭКОНОМИКА, 715-721.
9. Мараимова, К. Ш. (2022). НАЦИОНАЛЬНЫЕ ЦЕЛИ УСТОЙЧИВОГО РАЗВИТИЯ УЗБЕКИСТАНА. Экономика и социум, (4-3 (95)), 54-58.
10. Shukhratovna, M. K. (2022). National sustainable development goals of uzbekistan.
11. Sh, M. K. (2025). THE INTEGRATION TREND OF THE OIL INDUSTRY INTO RENEWABLE ENERGY SOURCES. Journal of Modern Educational Achievements, 11, 46-51.
12. Мараимова, К. (2024). ЯНГИ ЎЗБЕКИСТОН ШАРОИТИДА САНОАТ МАҲСУЛОТИ ИШЛАБ ЧИҚАРИШНИ ДИВЕРСИФИКАЦИЯЛАШНИНГ МИЛЛИЙ ХУСУСИЯТЛАРИ. Talqin va tadqiqotlar ilmiy-uslubiy jurnali, 2(43), 17-22.
13. Safaeva, S. (2020). Investment in the tourism sector: the pandemic and its impact. Архив научных исследований,(32).



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

14. Rikhsibaevna, S. S. (2025). Environmental sustainability in tourism: perspectives for Uzbekistan. *Mehnat iqtisodiyoti va inson kapitali*, 4(3), 176-185.
15. Sayyora, S. (2024). Analyzing Resource Allocation and Management in the Uzbekistan Hotel Industry Within the Context of Cloud, Distributed, and Parallel Systems. *International Journal of Biological Engineering and Agriculture*, 3(1), 118-128.
16. Сафаева, С. Р. (2021). Основные аспекты совершенствования сферы туризма в период мировой пандемии. Тенденции развития науки и образования, 79(3).
17. Абдимажитова, Б. М. Қ., & Гулямова, Г. С. (2024). ОСОБЕННОСТИ РЕГУЛИРОВАНИЯ НАЛОГООБЛОЖЕНИЯ В ЕС. *Oriental renaissance: Innovative, educational, natural and social sciences*, 4(6), 225-230.
18. Gulyamova, A., & Gulyamova, G. (2023). Use Of Innovative Services In The Development Of Retail Trade Banking System [Использование Инновационных Услуг В Развитии Розничной Торговли Банковской Системы]. *Paradigms of management, economics and law*, (4), 58-67.
19. Гулямова, А. Л., & Гулямова, Г. С. (2023). Использование инновационных услуг в развитии розничной торговли банковской системы. *Парадигмы управления, экономики и права*, (4 (10)), 58.
20. Gulshahnoz, G. SA Innovations in the study of global commodity markets/SA Gulyamova Gulshahnoz, AL Gulyamova. *Innovatsionnye tekhnologii v menedzhmente: upravlencheskiy i sotsial'nyy aspekty: materialy mezhdunarodnoy nauchnoprakticheskoy konferentsii*, Moskva, 30, 300-309.
21. Gulyamova, G. S., & Gulyamova, A. (2021). Innovations in the study of global commodity markets. In *ИННОВАЦИОННЫЕ ТЕХНОЛОГИИ В МЕНЕДЖМЕНТЕ: УПРАВЛЕНЧЕСКИЙ И СОЦИАЛЬНЫЙ АСПЕКТЫ* (pp. 300-309).



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

22. Азларова, А. (2020). РАҚАМЛИ ТРАНСФОРМАЦИЯ ШАРОИТИДА БАНКЛАРГА РАҚОБАТБАРДОШ МУТАХАССИС КАДРЛАР ТАЙЁРЛАШНИНГ ДОЛЗАРБ МАСАЛАЛАРИ. Архив научных исследований.
23. Sabirovna, G. G. (2022). Advantages and disadvantages of financial globalization. *Res Militaris*, 12(4), 2159-2163.
24. Gulyamova, G., Abdullaev, A., & Sharipova, U. (2020). Peculiarities and modern trends in world energy and the development of global pipeline transport networks. *Journal of Critical Reviews*, 7(4), 388-392.
25. Kizi, O. M. A., & Bakoeva, G. (2021). Prospects of the derivatives market in Uzbekistan. *ASIAN JOURNAL OF MULTIDIMENSIONAL RESEARCH*, 10(5), 297-302.
26. Bakoeva, G. M., & Ibodullaev, S. T. (2021). FOREIGN TRADE ACTIVITIES OF UZBEKISTAN: PROBLEMS AND OPPORTUNITIES FOR DEVELOPMENT. *International journal of trends in marketing management*, 9(1).
27. Baqoyeva, G. M., & Qilichov, K. K. (2022). O'ZBEKISTONDA QIMMATLI QOG'OZLAR BOZORINING HOZIRGI HOLATI TAHLILI VA BU BOZORDA KAPITAL JALB QILISHNING ISTIQBOLLARI. *Academic research in educational sciences*, 3(1), 712-725.
28. Matyakubovna, B. G. (2024). Improving Financial Technologies in Central Asia Countries. *World Economics and Finance Bulletin*, 35, 1-7.
29. Bakoeva, G. M. Analysis of Banks Activities That Have Successfully Implemented Digital Innovations in Uzbekistan. *American Journal of Business Management, Economics, and Banking*, 31, 7-16.



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

30. Gulbakhor, B. (2025). ACCOUNTING TREATMENT OF DERIVATIVES UNDER IFRS 9 STANDARDS. INTEGRATION OF EDUCATION AND SCIENCE: GLOBAL CHALLENGES AND SOLUTIONS, 1(2), 136-139.
31. Bakoeva, G. M. (2020). Foreign experience in applying IPO practice in Uzbekistan's securities market and potential of using derivatives. International Relations: Politics, Economics, Law, 48-57.
32. Азларова, А. (2020). РАҚАМЛИ ТРАНСФОРМАЦИЯ ШАРОИТИДА БАНКЛАРГА РАҚОБАТБАРДОШ МУТАХАССИС КАДРЛАР ТАЙЁРЛАШНИНГ ДОЛЗАРБ МАСАЛАЛАРИ. Архив научных исследований.
33. Ибодуллаев, Ш., & Бакоева, Г. (2021). Актуальные вопросы развития банковской системы Республики Узбекистан. Общество и инновации, 2(2/S), 179-186.
34. Bakoeva, G. M. (2023). PECULIARITIES OF THE CURRENT SITUATION OF THE BANKING IPO MARKET. In International Scientific and Current Research Conferences (pp. 78-81).
35. Bakoeva, G. M. (2024). The Essence Of Transformation Of The Banking Sector In The Context Of The Implementation Of Modern Financial Technologies. NATURALISTA CAMPANO, 28(1), 2569-2575.
36. Umida, S., Bahodir, I., & Otabek, B. (2022). The development of e-tourism in Uzbekistan: based on the foreign experience of the ASEAN countries. Confrencea, 5(5), 259-266.
37. Sharipova, U. A. (2022). WAYS TO DEVELOP INNOVATIVE BANKING SERVICES IN COMMERCIAL BANKS: FOREIGN EXPERIENCE. Thematics Journal of Economics, 8(1).
38. Umida, S. (2023). Features Of Tourism Growth In Uzbekistan: Based On Foreign Experience. World Economics and Finance Bulletin, 29, 203-209.



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

39. Sharipova, U. A. International Marketing: A Study of Marketing Strategies Adapted to International Markets. *World Bulletin of Management and Law*, 35, 58-60.
40. Sharipova, U. A., & Zaynutdinova, N. N. (2021). Nestle scandals, negative impact of conflicts to brand prestige. *Academicia Globe*, 2(6), 376-379.
41. Sanoqulov, A., & Sharipova, U. (2022). Jahon iqtisodiyotida kriptovalyutaning o'rni va istiqbollari. *Евразийский журнал социальных наук, философии и культуры*, 2(11), 96-99.
42. Min, H. (2019). Blockchain technology for enhancing supply chain resilience. *Business Horizons*, 62(1), 35–45. <https://doi.org/10.1016/j.bushor.2018.08.012>
43. Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. <https://bitcoin.org/bitcoin.pdf>
44. Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L. (2019). Blockchain technology and its relationships to sustainable supply chain management. *International Journal of Production Research*, 57(7), 2117–2135. <https://doi.org/10.1080/00207543.2018.1533261>
45. Swan, M. (2015). *Blockchain: Blueprint for a new economy*. O'Reilly Media.
46. Tapscott, D., & Tapscott, A. (2016). *Blockchain revolution*. Portfolio/Penguin.
47. Tian, F. (2016). An agri-food supply chain traceability system for China based on RFID & blockchain technology. *Proceedings of the 13th ICSSSM Conference*. <https://doi.org/10.1109/ICSSSM.2016.7538424>
48. World Economic Forum. (2020). *Building block(chain)s for a better planet*. World Economic Forum.
49. Zheng, Z., Xie, S., Dai, H., Chen, X., & Wang, H. (2018). Blockchain challenges and opportunities: A survey. *International Journal of Web and Grid Services*, 14(4), 352–375. <https://doi.org/10.1504/IJWGS.2018.095647>



International Congress on Economics, Management and Business Studies

Hosted Online from New York, USA

Date: 23rd June , 2026

Website: <https://econferencia.com>

-
50. Zhu, Q., Kouhizadeh, M., & Sarkis, J. (2019). Blockchain technology, supply chain information, and strategic product deletion management. *IEEE Engineering Management Review*, 47(1), 36–44. <https://doi.org/10.1109/EMR.2019.2898178>
51. Lucena, P., Binotto, A. P. D., da Silva Momo, F., & Kim, H. (2018). A case study for grain quality assurance tracking based on a Blockchain business network. *arXiv:1803.07812*.