

Call for Papers: Special Issue on *Operational Perspectives on Blockchain Applications*

Background

Blockchain—as a distributed-ledger technology—is evolving into a realistic component of enterprise digitization for an increasing number of organizations. The original application of blockchain technology—cryptocurrencies—that started with Bitcoin in 2009 and was considerably diversified by the Ethereum platform recently amassed a total market capitalization of \$1 trillion as of June 2022. Due to the lack of a traditional business entity in the background, the management of a cryptocurrency system is typically maintained by a decentralized autonomous organization (DAO). The seminal work of Zhao et al. (2022) analyzed its daily operational tasks, which include the development, voting, and execution of crowdsourced proposals. Blockchain-enabled smart contracts also provide a unique advantage to digital arts – authentication without relying on a third party. This in turn fosters a rapidly rising digital arts market in the form of non-fungible tokens (NFTs). The extent of speculative behavior – a longstanding topic in revenue management – spurs much controversy in the news.

Beyond cryptocurrency, applications of blockchain technology to support operations and supply chain management (OSCM) for products and services are growing rapidly in industries such as manufacturing (e.g., Kurpjuweit et al., 2021), logistics (e.g., Kuperberg & Butskiy, 2021), healthcare (e.g., Sharma et al., 2021), and luxury goods (e.g., Schmidt et al., 2021), as well as in the humanitarian sector (e.g., L’Hermitte & Nair, 2021) and for poverty alleviation (e.g., Tang, 2022).

While there are many barriers to successful blockchain implementation (Lin et al., 2022) and some early adopters might be disappointed (Sodhi et al., 2022), blockchain and decentralized technologies can create significant value by improving, for instance, supply chain traceability (Hastig & Sodhi, 2020), transparency (Chod et al., 2020), the management of deceptive counterfeits (Pun et al., 2021), and payment disputes (Vitasek et al., 2022). As such, the rise of blockchain and decentralized technologies and the challenges of reaping their benefits require a better and empirically grounded understanding of when to choose and how to implement blockchain and decentralized technologies for OSCM.

Scholars have started exploring the theoretical opportunities and challenges related to information immutability and reliability (e.g., Klöckner et al., 2022; Lumineau et al., 2021; Wang et al., 2022). Because the development of blockchain-based systems calls for new theory and comprehensive empirical studies, we believe that there is currently a golden opportunity to significantly refine and enhance how research in this important area of the field is conceptualized and performed.

Special Issue (SI) Focus

The scope of this SI is academically relevant to ongoing discussions in OSCM (e.g., Babich & Hilary, 2020; Kumar et al., 2020). In line with the *Journal of Operations Management's* (JOM's) call to further understand how technology affects operational processes and decisions (Heim et al., 2021; Holmström et al., 2019), we encourage submission of research to analyze how blockchain applications (related to cryptocurrency and other business processes) are developed in support of operational capabilities, how they are implemented in a given operation, and how they are likely to impact a wide range of stakeholders.

We encourage submissions that address clear and important research questions examining different aspects of cryptocurrency and blockchain in OSCM via rigorous theoretical and empirical approaches. We expect research questions to utilize different perspectives at various levels of analysis, drawing on not only OSCM literature but also related fields such as public policy, information technology, optimization, economics, strategy, and organizational theory. We especially welcome truly innovative and path-breaking research and projects bringing together scholars from distinct levels of analysis, research traditions, or disciplines.

The following are illustrative OM-relevant research topics in the context of cryptocurrency:

Transaction fee mechanism designs: What is the impact of different mechanism designs of transaction fees (e.g., English auction style design as in Bitcoin versus posted price style design as in the post EIP-1559 era of Ethereum) on user welfare and system performance? Will users learn faster and be more strategic under certain fee mechanisms?

Decentralized Autonomous Organization (DAO): While DAO offers the ultimate “flat” organizational structure and an extreme decentralization of daily operations via proposals, it might suffer from efficiency loss. This inefficiency in turn affects operational agility and quality of the service supported by the DAO. Thus, an operational study might focus on the decentralization-efficiency tradeoff.

Non-Fungible Tokens (NFTs): The rise of the NFT market is accompanied by controversies surrounding opportunistic behaviors such as scalping. OM scholars might leverage theories and insights from the revenue management literature to investigate the extent of scalping. For example, what type of products do the scalpers focus on? How do entry and exit fees affect the scalping behavior? How to value NFT in the presence of scalpers?

Transparency services: Cryptocurrency addresses are designed to be anonymous. However, services such Ethereum Name Service (ENS) try to add transparency into the activities and operations of the user behind the address. What are the costs and benefits of using transparency services such as ENS?

Crypto ecosystem knowledge: Platforms such as Gitcoin offer potential customers of cryptocurrency short tutorials, often gamified, to gain knowledge on various aspects of the crypto ecosystem and the blockchain technology behind it. This resembles a crypto-specific massive open online course (MOOC). It is interesting to evaluate how taking such tutorials, especially the ones related to crypto operations, affects user behavior.

Blockchain infrastructure: Blockchain infrastructure initiatives such as European Blockchain Services Infrastructure (EBSI) being developed in European Union and Blockchain Service Networks (BSN) being developed in China bring significant new challenges on the scale and complexity of business operations. For instance,

cryptocurrencies and NFTs are not allowed in the domestic portion of BSN while allowed in the international portion of the same network, leading to obvious incompatibility and monitoring issues in network operations. Global blockchains across different national administrations with varying governance rules in terms of decentralization and legality lead to numerous questions on how to manage operations.

Below are potential research topics on the broader blockchain applications in OSCM:

Design and implementation: What are the different types of blockchain (public, private, consortium, etc.) and how does their governance differ? What are the key challenges for their adoption and integration in operations and supply chains? How do blockchain and decentralized technologies interact with other digital technologies of the 4th Industrial Revolution?

Stakeholders on multiple levels: Who are the main parties (both at the individual and organizational levels, both public and private actors) involved in, and impacted by, blockchains? What are the tradeoffs and tensions among stakeholders in operations and supply chains?

Innovation and problem solving: How can blockchain and decentralized technologies mitigate some traditional operational and supply chain issues? What are their unique advantages and what kind of operational innovations do they support (e.g., visibility, data aggregation, information validation, contract automation, and system resiliency)?

Established OM approaches (e.g., supply chain contracting, supply chain risk management) in light of blockchain: Can established OM approaches be transferred to blockchain and decentralized technologies to increase efficiency? Or does blockchain allow or even require new approaches?

Relationships and collaboration: How does blockchain impact interorganizational relationships? How does blockchain impact the nature of collaborative agreements (B2B, B2C, etc.)? How is trust impacted by the use of blockchain and decentralized technologies?

Context and scope: What is the role of the institutional environment in the use of blockchains? How does the legal, cultural, and social context influence blockchain and decentralized technologies? What are the challenges if supply chains span multiple countries and industries, and should blockchains be used for supply chain financing, transparency, or execution?

Broader societal implications: What are the ethical, environmental, social, political, and cultural considerations of blockchains in operations and supply chains? How can blockchain technology contribute to the achievement of the sustainable development goal by supporting measures to combat climate change or alleviating poverty?

Downsides: What are the main costs, risks, and limitations associated with blockchain? To what extent is it possible to prevent and reduce these detrimental features? How can the challenges of bridging the physical and the digital world be overcome, a critical feature for blockchain applications for product- and service-based supply chains? Is the resource-intensive nature of blockchains (i.e., huge energy costs) an operational concern?

This list of issues is illustrative rather than exhaustive. This SI will focus on cryptocurrency and blockchain applications in a variety of industry contexts and national settings. We welcome diverse,

empirical methods, including qualitative case studies, field experiments, archival analysis, laboratory experiments, and prediction models.

Timeline

Submissions must be received by **September 30, 2023**, with first-round decisions targeted by three months after the submission deadline. If they wish, authors may send short abstracts to the editors before the submission deadline for feedback on fit with the SI. We will begin to process submissions as they come in, so earlier submissions are welcome.

Given the need for the SI to represent state-of-the-art knowledge, we plan a rapid publication cycle. All submissions will receive an initial comprehensive screening. Manuscripts deemed to have a reasonable chance of being accepted after no more than two rounds of review will enter the process.

Reviewers will be asked to respond quickly, and authors will have a strict deadline for revisions. Authors can expect high-quality and timely feedback by appropriate leading scholars in the field and clear editorial guidance should a revision be requested.

Guest Editors

Questions may be sent to any, or all, of the SI guest editors, at any time:

Fabrice Lumineau (lumineau@hku.hk) is a Professor in Strategic Management at the University of Hong Kong. He serves on the editorial boards of *Strategic Management Journal*, *Organization Science*, and *Strategic Organization*. His research investigates buyer-supplier relationships, blockchain governance, and the interplay between contract and trust in collaborative strategies. He has published more than 30 articles in the top management journals. He is, in particular, the recipient of *JOM*'s Ambassador Award and the *Journal of Supply Chain Management*'s (*JSCM*'s) Harold E. Fearon Best Paper Award. His work on blockchain has focused on governance mechanisms (Lumineau et al., 2021; Wang et al., 2022).

Guangzhi Shang (gshang@business.fsu.edu) is the Jim Moran Associate Professor of Operations Management at Florida State University's College of Business. His research has been published in *JOM*, *Production and Operations Management (POM)*, and *Decision Sciences (DS)*, among others, and recognized by best paper awards from *JOM*, *POM*, and *POMS* College of Operational Excellence. He serves as the Department Editor for the Empirical Research Methods Department at *JOM* and for the Retail Operations Department at *DS*. He co-produces a column together with Mike Galbreth and Mark Ferguson in the Reverse Logistics Magazine named "View from Academia," aimed at disseminating fresh-off-the-press academic knowledge among industry professionals dealing with consumer returns. His work on cryptocurrency focuses on evaluating the Bitcoin transaction fee market – a congested service system with name-your-own-price priority charges – from macro (Ilk et al., 2021) and micro perspectives (Shang et al., 2022).

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Operations Management (MSOM) Society, and Production and Operations Management Society (POMS). Dr. Swaminathan has published more than 65 scholarly journal articles and is the author of the edited volume *Indian Economic Superpower: Fiction or Future?* and coauthor of the edited volume *Responsible Business Operations*. He currently serves as a Department Editor for *Management Science (MS)* and *POM*. He has received numerous awards for his research work, including the National Science Foundation CAREER Award, George Nicholson Prize, Schwabacher Fellowship, and Weatherspoon Distinguished Research Award. He was listed among top 10 scholars in the world in OM based on publications in top journals (*JOM, MS, MSOM, POM*) from 2000-2015. He was also listed among the top 1% of scholars worldwide in Operations Research in a Stanford study in 2020. His work on blockchain has focused on combating counterfeit products (Pun et al., 2021) and supply chain applications (Lin et al. 2022).

Gerry Tsoukalas (gerryt@bu.edu) is Associate Professor in the Information Systems Department, at Boston University's Questrom School of Business, a Senior Fellow at the Wharton School, University of Pennsylvania, a Research Fellow at BU's Digital Business Institute and Cornell University's FinTech Initiative, a Fellow at the Luohan Academy (Alibaba Group), and a founding member of the [CBER-Crypto and Blockchain Economics Research Forum](#). He serves on the editorial boards of *MS* and *MSOM*, where he focuses primarily on emerging technologies. He is ranked in the top 0.5% of authors on the Social Science Research Network (SSRN) and is the recipient of numerous awards, including for best paper, teaching excellence, and associate editor meritorious service. His seminal work on cryptocurrency and blockchain economics was among the first to be published in leading academic journals in this field and has paved the way for new research tracks on a diverse set of topics such as blockchain in supply chains, decentralized finance, governance structures, and privacy preservation. His recent focus is on the design of decentralized business models and tokenomics (e.g., Chod et al., 2020; Gan et al., 2021; Tsoukalas & Falk, 2020).

Stephan M. Wagner (stwagner@ethz.ch) is a Professor of Supply Chain Management and Director of the Humanitarian Operations and Supply Chain Management Lab at the Swiss Federal Institute of Technology Zurich (ETH Zurich). He is Department Editor for *DS* and Associate Editor for *JOM, JSCM*, and the *Journal of Business Logistics*, and serves on the Editorial Board of journals such as *POM*. His research interests lie in the areas of digitalization in the supply chain, supplier innovation, the entrepreneurship–supply chain interface, and supply chain sustainability. He is author and editor of 13 books and over 150 book chapters and articles that appeared, for example, in *JOM, Academy of Management Journal, POM*, and *Organizational Research Methods*. He has received *JOM*'s Best Associate Editor (2013) and Associate Editor Service (2016) awards. His research on blockchain has focused on stock market reactions to firms' blockchain announcements (Klößner et al., 2022).

J. Leon Zhao (leonzhao@cuhk.edu.cn) is Presidential Chair Professor and Co-Head of Information Systems and Operations Management at the School of Management and Economics, Chinese University of Hong Kong (Shenzhen), and Director of the Center on Blockchain and Intelligent Technology (CBIT) at Shenzhen Institute of Data Economics. He is currently a co-editor of *Financial Innovation*, a Springer Open Access Journal, and has served as associate editor for journals such as *Information Systems Research (ISR)*, *IEEE Transactions on Services Computing*, *ACM Transactions on MIS*, and *Decision Support Systems*. He has also served as guest editor for about 30 special issues in journals such as these and *MIS Quarterly*. He has published in the areas of database and workflow management, data sciences, information technology applications, and blockchain applications in journals such as *MS, ISR, MIS Quarterly, INFORMS*

Journal on Computing, Journal of Management Information Systems, Decision Support Systems, and several IEEE and ACM Transactions, among other journals. His work on cryptocurrency and blockchain has focused on modeling and security issues in blockchain-based information systems (e.g., Zhao et al., 2016, Leng et al., 2022; Zhang et al., 2021).

References

- Babich, V., & Hilary, G. 2020. Distributed ledgers and operations: What operations management researchers should know about blockchain technology. *Manufacturing & Service Operations Management*, 22(2): 223-240.
- Browning, T. R., & de Treville, S. 2018. Editorial: New developments at the *Journal of Operations Management*. *Journal of Operations Management*, 64: 1-6.
- Chod, J., Trichakis, N., Tsoukalas, G., Aspegren, H., & Weber, M. 2020. On the financing benefits of supply chain transparency and blockchain adoption. *Management Science*, 66(10): 4378-4396.
- Gan, J., Tsoukalas, G., & Netessine, S. 2021. Initial coin offerings, speculation, and asset tokenization. *Management Science*, 67(2): 914-931.
- Hastig, G. M., & Sodhi, M. S. 2020. Blockchain for supply chain traceability: Business requirements and critical success factors. *Production and Operations Management*, 29(4): 935-954.
- Heim, G. R., Nair, A., Bendoly, E. 2021. Aims and criteria for advancing technology management research at the *Journal of Operations Management*, 67(8): 920-925.
- Holmström, J., Holweg, M., Lawson, B., Pil, F. K., & Wagner, S. M. 2019. The digitalization of operations and supply chain management: Theoretical and methodological implications. *Journal of Operations Management*, 65(8): 728-734.
- Ilk, N., Shang, G., Fan, S., & Zhao, L. J. 2021. Stability of transaction fees in Bitcoin: A supply and demand perspective. *MIS Quarterly*, 45(2): 563-592.
- Klößner, M., Schmidt, C. G., & Wagner, S. M. 2022. When blockchain creates shareholder value: Empirical evidence from international firm announcements. *Production and Operations Management*, 31(1): 46-64.
- Kumar, A., Liu, R., & Shan, Z. 2020. Is blockchain a silver bullet for supply chain management? Technical challenges and research opportunities. *Decision Sciences*, 51(1): 8-37.
- Kuperberg, M. & Butskiy, S. 2021. Blockchain use cases in transportation and logistics. In: Koschmider, A., & Schulte, S. (eds.), *Blockchain and Robotic Process Automation*. Cham: Springer, 61-76.
- Kurpjuweit, S., Schmidt, C. G., Klößner, M., & Wagner, S. M. 2021. Blockchain in additive manufacturing and its impact on supply chains. *Journal of Business Logistics*, 42(1): 46-70.
- L'Hermitte, C., & Nair, N.-K. C. 2021. A blockchain-enabled framework for sharing logistics resources during emergency operations. *Disasters*, 45(3): 527-554.
- Leng, L., Zhou, M., Zhao, J. L., Huang, Y., and Bian, Y., 2022. Blockchain security: A survey of techniques and research directions. *IEEE Transactions on Services Computing*, forthcoming.
- Lin, Y., Pyke, D., & Swaminathan, J.M. 2022. Identifying and overcoming barriers to blockchain implementation in supply chains. *Management and Business Review*, forthcoming.
- Lumineau, F., Wang, W., & Schilke, O. 2021. Blockchain governance – A new way of organizing collaborations? *Organization Science*, 32(2): 500-521.
- Pun, H., Swaminathan, J. M., & Hou, P. 2021. Blockchain adoption for combating deceptive counterfeits. *Production and Operations Management*, 30(4): 864-882.
- Schmidt, C. G., Klößner, M., & Wagner, S. M. 2021. Blockchain for supply chain traceability: Case examples for luxury goods. In: Voigt, K.-I., & Müller, J. (eds.), *Digital Business Models in Industrial Ecosystems: Lessons Learned From Industry 4.0 Across Europe*, Cham: Springer, 187-197.

- Shang, G., Ilk, N., & Fan, S. 2022. Need for speed, but how much does it cost? An empirical investigation of fee-speed relationship in Bitcoin. *Journal of Operations Management*, forthcoming.
- Sharma, L., Olson, J., Guha, A., & McDougal, L. 2021. How blockchain will transform the healthcare ecosystem. *Business Horizons*, 64(5): 673-682.
- Sodhi, M. M. S., Seyedghorban, Z., Tahernejad, H., & Samson, D. 2022. Why emerging supply chain technologies initially disappoint: Blockchain, IoT, and AI. *Production and Operations Management*, 31(6): 2517-2537.
- Tang, C. S. 2022. Innovative technology and operations for alleviating poverty through women's economic empowerment. *Production and Operations Management*, 31(1): 32-45.
- Tsoukalas, G., & Falk, B. H. 2020. Token-weighted crowdsourcing. *Management Science*, 66(9): 3843-3859.
- Vitasek, K., Bayliss, J., Owen, L., & Srivastava, N. 2022. How Walmart Canada uses blockchain to solve supply-chain challenges. *Harvard Business Review Digital Articles* (March 27).
- Wang, W., Lumineau, F., & Schilke, O. 2022. *Blockchains: Strategic Implications for Contracting, Trust, and Organizational Design*. Cambridge University Press (forthcoming).
- Zhang, W., Wei, C.-P., Jiang, Q., Peng, C.-H., & Zhao, J. L. 2021. Beyond the block: A novel blockchain-based technical model for long-term care insurance. *Journal of Management Information Systems*, 38(2), 374-400.
- Zhao, J. L., Fan, S. & Yan, J. 2016. Overview of business innovations and research opportunities in blockchain and introduction to the special issue. *Financial Innovation*, 2, 28.
- Zhao, X., Ai, P., Lai, F., Luo, X. (R.), & Benitez, J. 2022. Task management in decentralized autonomous organization. *Journal of Operations Management*, forthcoming.