

Book Review: The Rise of Blockchains

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ABSTRACT

This book explores how blockchain technology is disrupting economies and transforming societies. It offers detailed insights into the synergistic and complementary effects of blockchain and other new and emerging technologies such as artificial intelligence, the internet of things, satellite imagery, and digital twins. The book highlights how the developments of ecosystems around blockchain are helping to realize the potential of this technology to act as a “trust machine” across more contexts and settings. Multidisciplinary in both scope and perspectives, the book looks at blockchain’s potential for impacting challenges in supply chain management, security, privacy and compliancy issues, and transforming payment and settlement systems. It further provides insights into the opportunities, barriers, and enablers of blockchain adoption by organizations.

KEYWORDS

Artificial Intelligence, Blockchain, Crypto-Currency, Decentralized Autonomous Organization, Internet of Things, Ledgers, Organizational Transformation, Supply Chain Management

BOOK REVIEW: THE RISE OF BLOCKCHAINS

Disrupting economies and transforming societies

By: Nir Kshetri

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The Rise of Blockchains explores how blockchain technology is disrupting economies and transforming societies. It offers detailed insights into the synergistic and complementary effects of blockchain and other new and emerging technologies such as artificial intelligence, the Internet of Things(IoT), satellite imagery and digital twins (Kshetri, 2019). The book highlights how the developments of ecosystems around blockchain are helping to realize the potential of this technology to act as a

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“trust machine” across more contexts and settings (Shoker, 2021). Multidisciplinary in both scope and perspectives, the book looks at blockchain’s potential for impacting challenges in supply chain management, security, privacy and compliancy issues, and transforming payment and settlement systems (Li & Chen, 2023). It further provides insights into the opportunities, barriers, and enablers of blockchain adoption by organizations.

This book is divided into three parts. Part 1, “Blockchain and Organizational Transformation”, includes Chapter 1 through Chapter 3. The introductory chapter gives an overview and description of key issues and concepts related to blockchain. They include crypto-currency, permissionless and permissioned chains, public and private blockchain networks, centralized and decentralized ledgers, distributed ledger technology, smart contracts, blockchain as-a-service and initial coin offerings. It discusses the origin, evolution, and trajectory of blockchain. It also touches on the diverse value proposition of blockchain across various industries. Also, the roadmap of the book is discussed.

Chapter 2 offers an analysis of blockchain’s impacts on organizational forms, business models and strategies. It demonstrates how blockchain-led reduction in the cost of verification and the cost of networking can help promote transparency, build trust and reputation, and enhance efficiency in transactions, which can have important implications on the functioning of organizations. In this way, blockchain can disrupt economies and transform societies. In this chapter also provides detail discussion of decentralized autonomous organizations (DAOs) that are facilitated by smart contracts. For instance, a DAO could own a self-driving car to use as a taxi 24 hours a day. The income generated would be used to pay for its fuel, repairs and insurance. The money that is saved can be used to replace the vehicle at the end car’s life. A key focus of the chapter is also on the effects of blockchain and smart contracts on key mechanisms related to the governance of interorganizational relationships that are employed by participating firms. Specifically, this chapter looks at how formal contracts which focus on economic and legal aspects and relational norms and trust, which deal with social aspects are likely to be impacted by blockchain and smart contracts.

Chapter 3 provides an analysis of how many of the trust-related challenges in in inter-organizational relations can be overcome by combining blockchain with other advanced technologies, mainly so called the Fourth Revolution technologies, also known as the Fourth Industrial Revolution technologies. Specifically, it gives special consideration to the potential of significant added value as well as complementary and synergistic effects by combining blockchain with technologies such as artificial intelligence, Internet of things, analytical fingerprinting, satellite imagery, machine vision and digital twins. This chapter also explains how blockchain has been a missing link in current technological developments.

Part 2, “Key Application Areas of Blockchain”, includes Chapter 4 through Chapter 6. A good blockchain use case is one that yields measurable results of values for companies engaged in economic transactions that cannot be possible with other alternatives. Chapter 4 argues that supply chain is one such use case that can really benefit from blockchain. The Netherlands-based market intelligence platform Blockdata’s analysis found that traceability and provenance in supply chains was the most popular blockchain use case among the world’s biggest brands in 2020. Supply chains have many features that cannot be solved with huge database alone. Complex global Supply chain have no central authority. Companies involved in a supply chain can benefit from transparency, commercial confidentiality of data and an immutable record of transactions. This chapter gives an overview of how blockchain can facilitate the management of the flow of goods and services as well as key processes involved in the transformation raw materials into final products. It promotes an understanding of how blockchain is likely to affect key supply chain management objectives such as cost, quality, speed, dependability, risk reduction, sustainability and flexibility. It also provides a detailed analysis and description of blockchain’s roles in tracking the sources of insecurity in supply chains related to Internet of Things devices. A key focus of this chapter is also on the role of blockchain to enhance supply chain visibility.

In Chapter 5, this author evaluates blockchain's roles in strengthening cybersecurity, protecting privacy and improving compliance. Using practical applications and real-world examples, it argues that blockchain's decentralized feature is likely to result in a low susceptibility to manipulation and forgery by malicious participants. Since most of the data is currently stored in cloud data centers, it also compares how blockchain performs vis-vis the cloud in various aspects of security and privacy. Key underlying mechanisms related to the blockchain's impacts on the IoT security are also covered. From the security and privacy considerations, it highlights how blockchain-based solutions could possibly be, in many aspects, superior to the current IoT ecosystem, which mainly relies on centralized cloud servers through service providers. The chapter also delves into how blockchain can make it possible to contain an IoT security breach in a targeted way after it is discovered. It discusses how blockchain can address compliance issues such as Know Your Customer Anti-Money Laundering and Counter-Terrorism Financing. Special consideration is also given to how blockchain-based identity and access management systems can address some of the key challenges associated security, privacy and compliance.

Since bitcoin's peer-to-peer payment was the first popular blockchain application, blockchain is often regarded as a technology for financial services (Pagani, 2022). A number of blockchain applications have been developed for the payment and settlement systems. Indeed, payment and settlement have become a popular blockchain use case since this technology enables new ways of managing money and facilitating payments with ease and in more efficient way. Chapter 6 offers an analysis of how blockchain can transform payment and settlement systems by facilitating the implementation of clearing, transfer of funds and execution of the final settlement in order to provide a payment to a beneficiary. It provides a perspective on how blockchain solutions can address the existing challenges such as slow processing times, high fees and the lack of transparency in cross-border transfers. This chapter provides a perspective on how substantial efficiency gains can be achieved by using blockchain for digital assets' settlement process by decreasing transaction costs and reducing settlement risk as well as counterparty risk (the risk that a party can default on its obligation). It presents a variety of examples of payment and settlement systems being transformed by blockchain such as remittances, letter of credit and export transactions, trade finance, and supply chain finance. Moreover, several blockchain-based solutions with promising potential applications to increase the bankability of unbanked people are currently in proof-of-concept prototype and experiment phases. This chapter also reviews these applications.

Part 3, "Opportunities, Challenges, Implications and The Way Forward", includes Chapter 7 and Chapter 8. Chapter 7 provides details of key enablers of the diffusion and adoption of blockchain in organizations, and discusses major opportunities that can result from blockchain's use in organizations. These issues are discussed from the perspective of blockchain's potential to act as an effective governance mechanism so that it can contribute to produce trust. It evaluates initiatives of organizations, inter-organizational networks and industries on this front. It provides a perspective on the use of blockchain-based solutions to enhance branding, empower consumers and increase their satisfaction with services. This chapter also offers an analysis of blockchain's potential to bring major economic, political and social transformations. This chapter also offers an overview of barriers in implementing blockchain. This chapter also explains why deployment of blockchain-based solutions is difficult due to complex socio-economic, political and infrastructural challenges. Also discussed is how the lack of clarity in the regulatory environment and limited interest among the incumbent players in the market has been a major obstacle to the adoption of cross-border blockchain payment solutions.

In this final chapter, the author integrates the ideas discussed in earlier chapters regarding blockchain's potential to disrupt economies and transform societies. The technology's impact on business models, competitive positions, markets and industries are summarized. The author considers the future of blockchain and how the developments in other technologies are likely to affect its potential to work as a trust machine. The chapter also addresses the importance of

organizational, interorganizational and cultural changes to benefit from the potential of blockchain. It argues that while some actors may see an opportunity to distort the truth for profitable gains, new technologies such as AI and satellite imagery can change the economics of truth and bring blockchain closer to a truth machine. Recommendations and implications for policymakers are discussed. First, in order to strengthen security, regulators can make it obligatory for firms to deploy blockchain in supply chains of mission critical systems, and have substantial national security and economic benefits. Second, public policy efforts directed at protecting privacy using blockchain should focus on providing training to key stakeholders and increasing investment in this technology. Third, one way to enrich the blockchain ecosystem would be to turn attention to public–private partnerships. Finally, national governments should provide legal clarity and more information for parties to engage in smart contracts that are enforceable. Recommendations are also offered for companies and scholarly research.

This publication received rave reviews from many scholars. J. Brzezinski commented “This book is both a fantastic introduction to the fundamental concepts of blockchains and a unique discussion of the business models impacted by the blockchain. Kshetri provides an excellent sketch of the debate over using distributed ledgers to demonstrate business trustworthiness. The business cases Kshetri provides perfectly demonstrate the value offered by technology that uses strong cryptographic tools. One of the book’s best and most unique contributions is in its chapter on the synergies between artificial intelligence and the blockchain. The case studies from health care and other data-intensive industries offer invaluable details on data ownership management, privacy, data lineage management, and shared governance for users of blockchain and AI technologies. Kshetri also discusses emerging disruptive technologies, like the Metaverse, Web 3.0, and the Internet of Things. This is one of the best books on the subject and an excellent guide for readers of all levels.”

Bagis (2023) pointed out that “Kshetri’s *The Rise of Blockchains* is a timely, to-the-point, and detailed book on a relatively new and still obscure topic of blockchain technology. The book focuses on this all-new phenomenon deeply impacting, sometimes disrupting, and transforming our societies, policy-making, and the global economy today. And as a matter of fact, it also does a good job focusing on this new technology that has both introduced cryptocurrencies and transformed the supply chain, payments, privacy, and security systems.”

Jeffrey Voas commented “Professor Nir Kshetri’s exciting new text *The Rise of Blockchains: Disrupting Economies and Transforming Societies* is a must read for those interested in how distributed ledgers are impacting the political, economic, and social landscapes of societies, both developed and underdeveloped. Economists, politicians, and anyone else involved in finance should add this text to their reading list.”

Yogesh K. Dwivedi said “This book covers several key topics in blockchain, ranging from payment and settlement to cybersecurity and the supply chain. The book is well written and flows logically. It would be a great textbook for a blockchain course and a nice reference for researchers working in this field.”

Stephen C. Wingreen said “Professor Kshetri has delivered a very timely, well-written, and well-documented treatment of a topic that many people find difficult and sometimes opaque. I believe the content is accessible for both advanced undergrads and graduate students. I plan to adopt this book for my own blockchain course.”

Ravi S. Sharma recalled “In 2018, Ginni Rometty, the retired CEO of IBM, caused a stir when she said presciently: “Blockchain will do for transactions what the Internet did for information.” This compendium by Professor Nir Kshetri attempts to explain why and how such a transformation is taking place. The comprehensive book is framed by business organizations and market opportunities. It addresses the essentials of how Blockchains work, and their synergies with decentralized, autonomous organisations as well as complementary technologies such as AI. It also provides up-to-date coverage of hot-button issues such as use-cases in supply chain management with traceability-as-a-service. It shows how such ubiquitous use-cases will allow Blockchain to cross

the chasm. Two enabling technologies – security as an integral aspect of mainstream platforms and Blockchain-enabled payments which may counter the centralizing features of proposed CBDC initiatives - will bring confidence in such a trust-free environment. The book closes with a realistic assessment of emerging opportunities, barriers, trends and policy implications. It is commendable that Professor Kshetri, acknowledged as one of the most impactful researchers on Blockchain, has taken it upon himself to make translational his deep insights and understanding on the topic. I recommend this book highly to any business executive or specialist student interested in exploiting the value of Blockchains.”

With a focus on both theoretical and practical knowledge related to blockchain, this book must be an important read for business and management scholars, particularly those focusing on organization studies, information systems, and supply chain management. It is also a useful book for economics students and economists working with cryptocurrencies.

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