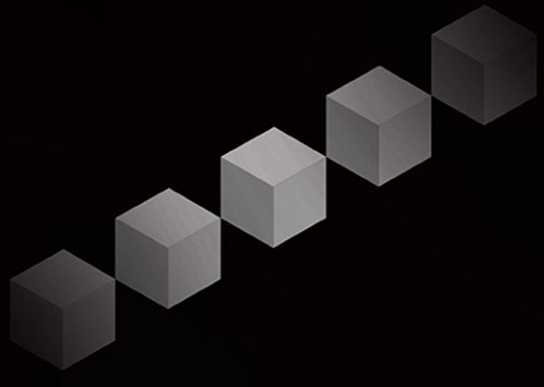
BLOCKCHAIN FOR BUSINESS

Discover How Blockchain Networks Are Transforming Companies, Driving Growth, and Creating New Business Models



JAI SINGH ARUN JERRY CUOMO NITIN GAUR

Foreword by DON TAPSCOTT

Praise for
Blockchain for Business

"Much has been written about blockchain in the past few years: what it is and what it is not (at various levels of detail), as well as the technology's long-term strategic value for companies, industries, and economies. However, what we've been missing is a practical, operational, 'how to' set of steps for creating, implementing, and operating a blockchain-based solution. This book aims to fill that gap. It's an invaluable tool for anyone ready to take the plunge and start taking advantage of this remarkable technology.

"Most technologies can be implemented one business at a time. Not so with blockchain. Blockchain is particularly valuable when applied to a collection of companies working closely together as a business ecosystem, such as a supply chain. *Blockchain for Business* goes into great detail about what it takes to organize and manage such an ecosystem, including the technical and business models that in the end drive the decisions about whether to join or not, and the governance necessary for a smooth, efficient operations. It also nicely explains the necessary technical expertise and management roles needed to successfully create and operate blockchain frameworks and applications.

"*Blockchain for Business* is an invaluable tool for anyone ready to take the plunge and start taking advantage of this remarkable technology."

—Irving Wladawsky-Berger, Research Affiliate, MIT; Columnist, WSJ CIO Journal; VP Emeritus, IBM

"Jai, Jerry, and Nitin have written the guidebook to address the critical knowledge gap that exists between the hype of blockchain and cryptocurrencies and the pragmatic utilization of blockchain technology for transforming businesses. *Blockchain for Business* leverages their firsthand insights and provides a practical approach for business and technical leaders

Travel and Transportation

The travel and transportation environments have millions of moving parts. Blockchain technologies can help each part move in the safe, secure, efficient, and frictionless ways that are necessary for business success and customer satisfaction.

Consider the airline industry's practice of interlining, also known as *interline ticketing* and *interline booking*, is a voluntary commercial agreement between individual airlines to handle passengers traveling on itineraries that require multiple flights on multiple airlines. As part of this practice, multiple business-to-business transactions occur between booking agents, air carriers, credit card companies, and airports. The results often lead to complexity, errors, or transaction disputes. In contrast, when all parties use the same data in a blockchain environment, common information visibility and sharing can eliminate inconsistencies. Whether used on land, at sea, or in the air, blockchain technology speeds transactions, eliminates fraud, and helps streamline transportation operations with an immutable, trustworthy, and secure system that builds trust among parties.

Personnel Coordination

Passenger and cargo safety are paramount in every form of transportation, but crew training and certification can involve multiple agencies over long periods. Every transport terminal is a hive of activity, with personnel who are employed by a wide range of companies with duties as diverse as fuel delivery, ticket taking, catering, shuttle-cart driving, cleaning, and more. Each employee requires vetting for security, and all of their activities must be coordinated.

With its shared and immutable ledger that prevents entries from being changed or falsified, blockchain can provide the verification and insight that transportation companies need. Certificates and licenses can be stored for each crew member and verified and updated as more training occurs. Blockchain provides a central management mechanism, with

visibility into the common information that is necessary for settling disputes over pay, work status, or other issues that might arise.

Cargo Handling

Shipping goods involves multiple parties, including senders, receivers, carriers, and regulators. Given the involvement of so many entities, each with a different records system, blockchain can help track the location and condition of cargo. Using shared records of ownership, location, and movement, carriers can improve their load utilization, and senders and receivers can speed delivery by clearing customs in transit instead of waiting at the terminal.

For example, dnata (Dubai National Air Transport Association), a global provider of ground handling, cargo, travel, and flight catering services for more than 400 airlines, teamed with IBM to eliminate redundant data and improve visibility and transparency for cargo services by using blockchain. The results streamlined and simplified the processes from the point of origin to the final destination. The blockchain solution achieves this task by digitizing the supply chain and by using a peer-to-peer network to manage and track each cargo container's path.

Challenges

The primary challenges with the application of blockchain are not about having a perfect and matured technology: The evolution of blockchain technology will undoubtedly continue, much as Internet technology continues to advance nearly four decades after its first introduction. Blockchain technology has been used for several years as an underlying foundation for cryptocurrency application, and lately many organizations have advanced it to ensure its enterprise readiness for other industries. The key challenges are choosing the right scope, having the right motivation for a business and its participants, ensuring the right governance structure, and having the correct team and technology in place. These challenges can be conquered if you make deliberate and diligent efforts to manage the

blockchain network effectively and focus on driving the ultimate transformation that you envisioned.

As shown in Figure 2.3, addressing the challenges involves three aspects: The scope helps you determine what plan you should make for a blockchain network, governance defines how you should operate it, and motivation drives why you should build or participate in it.

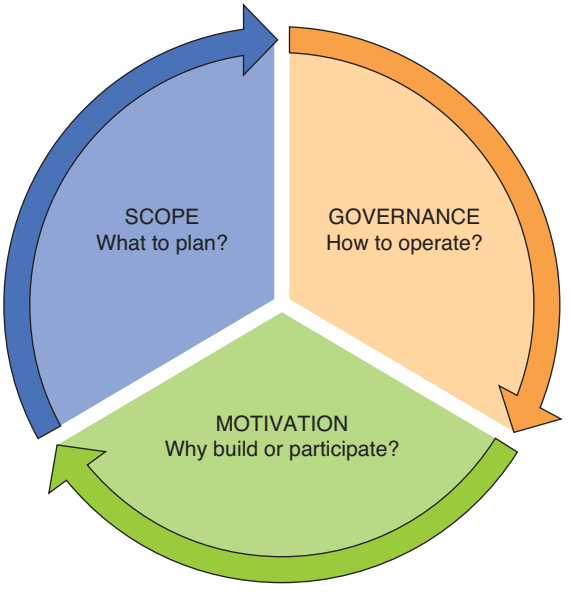


Figure 2.3 Addressing the challenges.

SCOPE

Although blockchain has the potential to disrupt many businesses, current business policies and requirements might not immediately support the transformation. Also, blockchain might not be feasible for multiple reasons, such as existing government, business, and legal agreements and laws, exposure, global reputation, bureaucracy, and partnerships. Therefore, it is important to select the right scope so that you can deliver success incrementally, albeit with a big dream in mind for transformation.

The scope selection exercise reflects your vision and business outcome expectations. However, given that blockchain touches critical elements of an organization's structure, business model, and ecosystem, it is important to consider the scope of each of these items in the context of your desired short-term and long-term business outcomes.

The success of a blockchain project is determined by the correct selection of scope, so define your minimal viable product (MVP) and minimal viable ecosystem (MVE) with a clear start state of your blockchain project; determine your Specific, Measurable, Achievable, Results-focused, and Time-bound (SMART) end goal; and identify key activities that must be performed to pinpoint the following items:

- Vulnerabilities and inefficiencies to identify disruptive business use cases
- Business network participants and ecosystem readiness
- Business model and differentiation needed to compete
- Governance plan and policy for cooperation and trust
- Operational plan, including costs and responsibilities
- Technology and vendor selection

Motivation

The right incentive plan drives motivation to establish the correct behavior, trust, and cooperation in any business network involving consumers and partners. A blockchain network includes both founders of the network and participants. However, because of the nature of the distributed organizations and the decentralized ecosystem that is ready for shared gain and shared pain, it is important to develop an appropriate incentive structure so that everyone is motivated and acts as a trusted partner in the network. Bad actors in a network can jeopardize your ability to achieve your goals within the planned time, costs, and resources conditions.

Incentives in blockchain business networks are not monetary, but might be instead visibility, access, share, and exchange rights. For example, a

regulator might want access to and visibility of transactions for compliance purpose, a nonfounding member might want to participate and share its assets for exchange or return value in a network, and a founding member such as a government agency might want specific rights for a business policy or transaction while maintaining trust and transparency.

A token can be issued as an incentive to grow transactions, assets exchange, or the value of transactions in a network. Tokens represent equity or rewards in the systems, and the value of those rewards grow if everyone is performing at an expected or higher level. These tokens are used in managing the loyalty points in retail or consumer businesses, carbon credits in energy trading, credit scores in a financial system, course or merit certification in an educational system, or even a brand or a social image in a reputation system.

To drive sustained motivation in a blockchain network, you must evaluate the following aspects:

- Who brings which data, knowledge, or assets to the network?
- What is the value of their contributions to the network?
- What do they expect in return?
- What will keep them motivated to be trusted participants?
- What incentives you can offer for short-term versus long-term engagement?
- What policies can enable automated incentive allocation?

GOVERNANCE

A good business depends on having a good governance structure and a team of trusted partners. The success and failure of a business entirely depends on its ability to develop an ecosystem that is properly governed and incentivized.

Governance is the most critical and compulsory requirement for a blockchain project's success because it maintains a decentralized property with self-executable business and legal contracts that are embodied in the transactions as smart contracts. Although this approach drives automation, speed, and efficiency in a business network, it is critical to understand how the smart contracts are developed and managed as part of the governance structure. In unforeseeable situations, when you have trusted and motivated partners in a network, consensus building becomes much easier and occurs much faster.

The risk in a blockchain project is directly proportional to the governance complexity that drives increased uncertainty, delays, and costs. The public blockchain networks have higher risks than their private, permissioned, or hybrid counterparts due to the difficulty in governance efficacy. Although some use cases are perfect for public blockchain, others are not. Unless you plan carefully, having an open, public, and decentralized governance structure might not be feasible for many of your enterprise use cases because of privacy, compliance, and regulatory requirements. Because many industries' regulators are investigating blockchain technology implications for their compliance requirements and addressing them, your network must adhere to the existing compliance policies.

A governance structure in a blockchain network can include multiple levels of workgroups that should have a dedicated focus to address the following specific concerns:

- The disruptive nature of the envisioned business model and its impact on participants
- The roles and accountability of participants
- Decision rights
- Shared incentives and disincentives
- Intellectual property rights and liabilities
- Existing regulatory and compliance policies and awareness of future changes
- Technical design and architecture