



Research Insights

Advancing global trade with blockchain

How to unleash value
from trusted, interconnected
marketplaces

IBM Institute for
Business Value



How IBM can help

As one of the world's leading research organizations and top contributors to open source projects, IBM is committed to the collaborative effort required to transform how people, governments, and businesses transact and interact. Specific to the facilitation of global trade with blockchain, IBM is evolving into a "convener" of trade networks.

This role draws upon IBM's experience in blockchain technology, consulting, and systems integration to help design and rapidly adopt blockchain solutions. IBM helps clients leverage the global scale, business domain expertise, and deep cloud integration experience required for the application of these technologies. Learn more at www.ibm.com/blockchain and ibm.co/blockchainseries



Chris Southworth

Secretary General
International Chamber of Commerce,
United Kingdom
[linkedin.com/in/csouthworth/](https://www.linkedin.com/in/csouthworth/)

Foreword

COVID-19 has underscored the interconnectedness of the world. But it has also exposed the need for sustainability and resiliency in the systems that underpin the global economy—particularly for small and medium enterprises and global value chains. And the International Chamber of Commerce (ICC) believes that countries with strong digital infrastructures can better deal with disruption.

The ICC has long partnered with government, business, and wider stakeholders to promote open, cross-border trade. Digitization is a top global priority, especially as a result of the COVID-19 crisis. In “Advancing global trade with blockchain: How to unleash value from trusted, interconnected marketplaces,” the IBM Institute for Business Value presents impressive evidence on why trade needs to be digitized further.

The report underscores the important role of trusted data in the global marketplace. In fact, this report validates the approach of the ICC Digital Trade Roadmap and ICC Digital Standards Initiative, which build on efforts to digitize trade by:

- Modernizing and harmonizing rules to create a scalable business environment
- Introducing interoperable standards to connect digital platforms and technologies
- Supporting industry to modernize digital systems and processes.

Digitization of trade involves a complex set of stakeholders across multiple jurisdictions and sectors, ranging from governments and regulators to industry leaders. This report acts as an important tool that validates the need to forge ahead and validates what’s possible if we come together. To extract the full value from blockchain and the digitization of trade, everybody needs to be on board. To understand why, this report is an essential read.

By Parm Sangha,
Veena Pureswaran,
and Smitha Soman

Key takeaways

Organizations are interested in blockchain for more than outright profitability. Blockchain adoption has steadily increased, with 41 percent of organizations reporting a positive return on investment (ROI). As networks, rather than individual organizations, become the unit of competition, metrics expand beyond the balance sheet. For example, customer satisfaction ranks first among surveyed organizations as a measure of operational success across blockchain networks.

To succeed in the global marketplace enabled by blockchain, organizations need to understand when to share data—and when not to. Eight in ten organizations surveyed say trusted data is important to their organization. Yet only five in ten of those organizations are willing to share data or offer value in exchange for data. This can inhibit their global competitiveness.

For global marketplaces to gain widespread participation, they'll need trusted, neutral governance. Doing business globally requires trust, an abundance of it. The good news: blockchain actually becomes that custodian of trust, no intermediaries required. This neutral entity can help drive fair, open governance and standards—a critical foundation to unleashing the value from blockchain-driven marketplaces in global trade.

The blockchain economy: Breaking through barriers to global trade

Industries and governments are continuously seeking ways to optimize the movement of goods, data, and currencies across global supply chains. Yet for all that effort, global growth needs a jumpstart. In 2019, the world's GDP rose by roughly 2.2 percent.¹ And in 2020, we are seeing the impact of unprecedented global events tied to the COVID-19 pandemic and resulting economic upheaval.

To ease economic barriers in trade, improving *visible frictions* such as tariffs and quotas, with most outcomes focused on reducing cost, can help. The World Trade Organization (WTO) expects that new technology will help to further reduce trade costs. And as a result of those falling trade costs, global trade could grow by 31 to 34 percent over 15 years.²

But just as intriguing: the 2017 Trade Facilitation Agreement (TFA), signed by over 160 World Trade Organization (WTO) member countries, projects the achievement of significant cost reductions by improving *nonvisible frictions* in trade such as paperwork, procedures, and administrative formalities.³

Enter blockchain technology. It has the potential to diminish these nonvisible frictions in global business, reduce cost, and save time while also mitigating risk and creating new business models.⁴ Early adopter organizations have been working with partners—and even competitors—to improve existing, shared processes.⁵ As they continue to collaborate in nontraditional ways, they recognize that blockchain brings a level of trust both among participants and in data shared. This could include dealing with customs paperwork, cross-border payments, or contracts for a service.

But for global trade to see the full range of benefits from blockchain, trusted data needs to be shared and value exchanged both on blockchain and non-blockchain networks—not just among participants in a single network, but across interconnected networks in digital marketplaces. As a neutral agent for trust, a “network of networks” economy could help companies build greater flexibility and resilience into operational and supply chain management—both essential attributes in times of crisis.

As well, a blockchain-enabled marketplace highlights the importance of transparency and insights within the global economy.

The movement of data across these digital marketplaces presents new challenges. Interconnected networks require validation of the data being exchanged—think of digital contracts and signatures that need legal validation, and border and custom processes. To achieve data sovereignty, organizations must also navigate a more stringent regulatory environment related to digital trade, with factors such as the EU’s General Data Protection Regulation (GDPR) to consider.⁶ With network validation and enhanced data security, blockchain can help maintain data source integrity while protecting data privacy.

When it comes to unlocking the global value of digitized trade, governments, regulators, and even trade associations are assuming more active roles. For example, the ICC Digital Trade Standards Initiative (DSI) builds on previous initiatives through the development of open trade standards. DSI will continue to drive technical interoperability among blockchain-based networks and technology platforms that have entered the trade space over the past two years. According to ICC Secretary General John W.H. Denton AO, “Universal standards will connect existing digital islands and enable market forces to improve customer experience.”⁷

Even in the age of COVID-19, organizations invested or interested in global trade will still seek to optimize digital transformation efforts. They’ll evaluate shifting priorities and market conditions and course-correct their blockchain initiatives accordingly.

To examine the value gained from interconnected blockchain marketplaces and their role in facilitating global trade, in late 2019, the IBM Institute for Business Value (IBV) surveyed more than 1,000 executives across 22 industries in 34 countries. This report includes insights and actions related to:

- The current blockchain landscape and expectations related to value creation
- Why trusted marketplaces on blockchain can promote a data-driven, global economy
- How to approach the establishment and governance of interconnected global networks.



Network participants expect an average of **20% ROI in 4 to 5 years and more than 50% ROI over 10 years** on their blockchain investments.



88% of organizations tell us that data standards across networks are an important requirement for joining an industry-wide blockchain network.



In the next three years, 85% of CTOs and CIOs expect to work with multiple blockchain technologies.

Even in the age of COVID-19, organizations interested in global trade will seek to optimize digital transformation efforts.

Dawn is coming: Blockchain as a profitable investment

Any transformative technology often requires sweat equity and perseverance before adopters see results—hence the dreaded “J” curve that represents an ROI dip in early adoption stages, then a rise.⁸ Blockchain is no exception, and our research finds that blockchain adoption is approaching an inflection point. With a surge in blockchain activity in 2019, four in ten of our surveyed organizations already report positive returns on blockchain investments, with the US and China leading the countries seeing early returns.

Some of these early returns could be due to combined benefits from required digitization efforts, process optimization activities, and brand uplift—all part of implementing blockchain solutions. As of November 2019, worldwide spending on blockchain solutions aligned with this increased optimism and was expected to reach almost USD 16 billion by 2023.⁹ But more sobering: in the short term, given the economic impact of COVID-19, worldwide IT spend is projected to decline by 2.7 percent.¹⁰

However, unprecedented challenges have increased the need for technologies like blockchain, which can provide trust in a decentralized manner, help with data sharing concerns, and help mitigate supply chain disruptions.¹¹ This could mean a temporary stall in some IT projects while strategically adapting other investments.

When it comes to blockchain, our respondents report that *billing and settlement* is their number one area for implementations. *Data sharing, reconciliation, and management* places second, with *payments* the third most popular business area—all trends that can contribute to blockchain’s role in global trade.

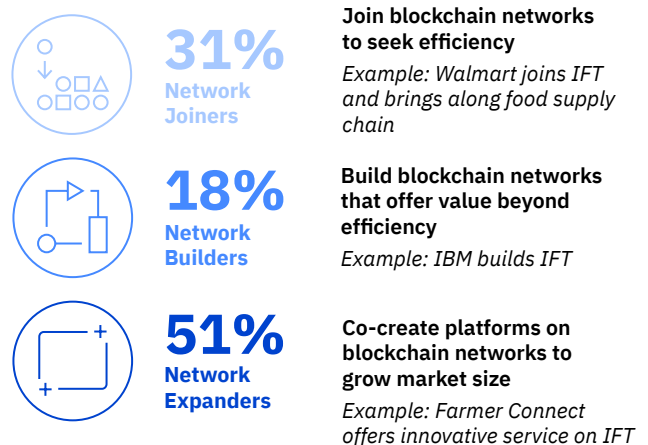
As organizations work together on blockchain applications in a variety of business areas, they are gaining a clearer picture of their role in the network and the nature of value they can generate together.

The blockchain ecosystem: Networks and roles

Our research identified three distinct types of organizations based on the primary roles each plays within a blockchain network, as well as their governance priorities (see Figure 1 and case study, “IBM Food Trust and ‘Thank my Farmer’” on page 5). Each type—Network Joiners, Network Builders, and Network Expanders—has different expectations of blockchain’s value, and is driven by distinct motivations and challenges. On a practical note, as blockchain networks mature and organizations better understand the potential of blockchain, these roles could evolve from one type to another. Organizations could also decide to play different roles on different networks.

Figure 1

Three distinct types of organizations emerged based on blockchain network intent and governance priorities



Source: IBM Institute for Business Value analysis.

Network Joiners, almost a third of respondents, are likely to join existing or new blockchain networks. They primarily seek efficiency, compared to other organizations that prioritize revenue growth and cost reduction from blockchain. The appeal of efficiency also means that joining more than one network—with multiple protocols and a lack of uniform governance standards—challenges them. Motivations? To cite several: accessing new markets, perhaps globally; complying with regulatory and government directives; and at times, joining their partners or customers already on the blockchain network.

Network Builders form the smallest group, with just 18 percent of respondents. They create blockchain networks within their industries that provide new services and new value. As well, they require communication standards for open movement of data among networks—standards that are critical to promoting broad participation. In keeping with their standing as market leaders (defined as achieving higher revenue growth and profitability in their industries), Builders are furthest along in adopting blockchain. In fact, when compared to Joiners and Expanders, Builders report twice as often that they already have a roadmap to optimize shared processes across ecosystems.

Network Expanders form the largest group of organizations with 51 percent of respondents. They stand ready to build industry or cross-industry networks or even to join other blockchain networks, all in order to grow not just market share, but overall market size. Their main objective: to drive innovation by co-creating services and apps that augment or expand the value of the network, and put consumers in control of their data. For example, a cross-industry network could offer services such as payment systems or customs processing that would benefit diverse organizations. Like Builders, Expanders require communication standards for open movement of data among networks.

IBM Food Trust and “Thank my Farmer”

Joiners, Builders, and Expanders create a more transparent global food system¹²

IBM’s food supply chain network, the IBM Food Trust (IFT), is a blockchain-based network that offers data spanning the food ecosystem to member retailers, suppliers, growers, and food industry providers. The goal is to help provide greater traceability, transparency, and efficiency, as well as an optimized food supply chain.

Walmart played a unique role in the IFT. Initially, it partnered with IBM as the food traceability system was designed to span many parties, including Walmart’s suppliers and competitors. This system eventually evolved into the IFT, with Walmart serving as a “super” Joiner by bringing its massive supply chain ecosystem onto the IFT network.

The same blockchain technology behind IFT also drives the “Thank My Farmer” app, introduced by Farmer Connect. This consumer-facing app pulls standardized information from blockchain in a way that can be used across the industry. It connects the user to farmers, traders, roasters, and brands. Farmer Connect’s willingness to increase value through the IFT, as well as its aim to grow market size by offering innovative services to all members, makes it a prime example of an Expander.

Payoff: Paths to monetization

Blockchain value is driven by purpose. While all three groups of organizations prioritize blockchain for *billing and settlement* and *payments*, they seek out blockchain for different purposes, depending on their role. Because Joiners expect to consume services on multiple blockchain networks, they also prioritize *data sharing* and *consumer insights*. Builders struggle with scaling the platforms they create, and so additionally focus their blockchain efforts on *global fraud and compliance issues*, such as GDPR. Meanwhile, Expanders also create innovative blockchain applications to share, reconcile, and manage data spanning cross-industry ecosystems—and ultimately grow market size. (See case study “IBM Food Trust” on page 5 for sample Expander Farmer Connect’s innovation.)

Across the board, organizations acknowledge that network roles heavily influence distribution of revenues generated on blockchain platforms, with Builders expecting to earn a lion’s share for their setup work and costs incurred. That’s because today, networks are primarily monetized based on the value and volume of the transactions generated on these networks. For example, a network might charge .01 percent of a transaction on a global payment platform.¹³

At the same time, Builders and Expanders anticipate providing blockchain services via apps much more than Joiners. These apps or services could include processes and procedures involved in global trade—for instance, monetizing a track and trace service by charging a monthly subscription fee.

Another monetization model could involve charging based on the degree of insights provided, with insights increasing in value along with their complexity. One scenario: TradeLens, a blockchain industry platform that helps participants to digitally connect, share information, and collaborate across the shipping supply chain. Insights provided on this platform vary in their depth. For example, data on a container’s movement door to door is more complex than its port-to-port status—and the charge for that data would increase commensurately.

In flux: Shifting power, shifting value

When pursuing blockchain solutions, all groups report network development as their highest cost—almost 30 percent of total expenses across the board. Getting blockchain into production can be challenging, given complexities in aligning the solution to security, business continuity plans, disaster recovery, and other requirements of cloud-based services.

As blockchain networks emerge, Joiners and Expanders lag Builders in returns. This is because Joiners are mostly beneficiaries of the services or efficiencies provided on these networks, while Expanders are at the inflection point of consuming or adding to the value on networks. Because of Builders’ broader role and front-loaded investment in developing network infrastructure, decision management, and governance rules, they earn a larger percentage of network-generated revenue.

As blockchain networks emerge, Joiners and Expanders lag Builders in returns. But over time, network value can dramatically redistribute.

But over time, network value can dramatically redistribute. Builders at the center of these networks expect their returns to be capped, with profits leveling off and value shifting to the consumers of services on the edge of the networks—the Joiners and Expanders. This is because, as blockchain networks mature, their cutting-edge services become mainstream. The Joiner, as the consumer of services, now has the power to choose from competing networks. Also, as networks grow and gain momentum, Joiners see increasing value and efficiencies as network effects kick in.

This power shift compels Builders to launch still more innovations, perhaps evolving into Expanders, developing capabilities that appeal across networks and industries. In short, if Builders want to drive market size, not just market share, they need to provide more value through more services.

Specifically, as power and value in a builder-centric network shift across the network to Joiners and Expanders, these two groups expect to see more than 60 percent ROI on their blockchain investments over ten years, more than a 50 percent increase over the Builders (see Figure 2). In part, this is due to the industry-diverse value that an Expander provides, as opposed to vertical siloed solutions from a Builder (see case study, “we.trade” on page 8).

Figure 2

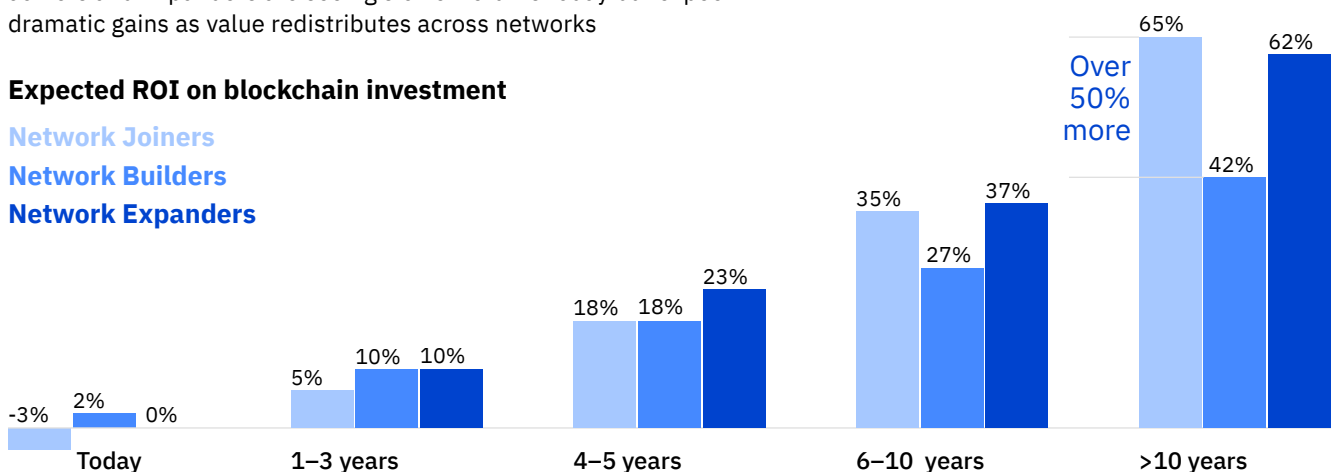
Joiners and Expanders are seeing slower returns today but expect dramatic gains as value redistributes across networks

Expected ROI on blockchain investment

Network Joiners

Network Builders

Network Expanders



Q. What ROI do you expect to achieve on your blockchain investment over the above time periods?

we.trade

The power of joining a blockchain network¹⁴

we.trade, a joint venture between 12 major European banks, began full operations in January 2019. This blockchain-based trading platform reduces counterparty risk and enables even the smallest companies to participate in cross-border trading. The platform also serves as a “one-stop shop” of real-time information on any trade visible to all parties and enables automatic payments through smart contracts.

This international trading platform attracts not just financial services companies but also logistics and insurance businesses. Increasing the number of overall participants and resulting transactions on the platform grows and diversifies its revenue streams. As the network expands, more companies, including small and medium enterprises (SMEs), can grow their businesses and diversify revenue through international trade.

Let’s examine we.trade through the network role model. HSBC drove construction of we.trade in collaboration with other banks and therefore is a Network Builder. For HSBC, this platform provided a lower-cost, lower-risk path to selling common financial services to SMEs, creating new revenue. And as an industry leader, HSBC created market “pull” for we.trade.

Eurobank is one example of a Network Joiner. It did not assume the role of Network Builder, but as a Joiner it achieved operational efficiency and a broader market.

As more trade flows through the platform, increasing its market share, HSBC can now work with other like-minded organizations and curate greater value across networks such as TradeLens. In its participation across networks, HSBC is growing into a Network Expander.

“We realize that global trade and trade finance are being rapidly digitized,” says Omer Ahsan, Head of Commercial Banking Innovation and Propositions at HSBC in the UK. “At HSBC, we are making this happen by investing across several blockchain initiatives over the past three years. We now view ourselves as a ‘super connector’—enabling networks to interconnect by design to drive greater and inclusive value.”

Action guide

Dawn is coming: Blockchain as a profitable investment

Organizations should prepare to participate in multiple ways. The nature of blockchain is fluid—you often begin again, even as you’ve simultaneously joined and established multiple networks. Here are three paths:

- 1. Connect expeditiously.** Score initial success by joining an existing network. Learn from our surveyed organizations: participation is worth the investment. Our Joiner organizations expect at least 18 percent ROI on their blockchain investments in four to five years. Examine your business processes to determine the greatest potential efficiencies and what blockchain services could address them. When competing networks offer similar services, analyze how candidate blockchain networks are governed and monetized—and how your data will be managed.
- 2. Build ambitiously.** Can your organization alleviate an unmet need in your industry? Consider building. But aim for scalability, because building a static network won’t provide long-term value. You may plan to offer cutting-edge services, but they—or something similar—could eventually be adopted and added across other networks, becoming business as usual. You’ll need to continually innovate, developing services that appeal to multiple blockchain networks and industries. The good news is that by their nature, networks translate to collective success.
- 3. Expand collaboratively.** You’re looking at expanding not just market share, but market size. Don’t expect the blockchain network that you build or join to exist as a standalone. In the next three years, 85 percent of organizations anticipate working with more than one blockchain technology. Actively seek and plan for governance and standards for interconnectivity and interoperability. Another option: if you are looking to innovate, consider co-creating on an existing network. Many Builders evolve into Expanders through partnerships.

“We realize that global trade and trade finance are being rapidly digitized. At HSBC, we are making this happen by investing across several blockchain initiatives over the past three years.”

Omer Ahsan, Head of Commercial Banking Innovation and Propositions at HSBC, UK

Trusted marketplaces: Toward a data-driven blockchain economy

Consider the intense volume of data collected, analyzed, and made actionable across organizations today through IoT, analytics, and AI. As blockchain networks organize, a shared, trusted pool of data and resulting insights become their most valued assets. Trusted data is moved not just *within* networks but *beyond* networks, on marketplaces both on and off blockchain. Blockchain can help validate identity of parties at the right time, facilitating the trusted transfer of data, goods, services, and money (see Table 1).

A blockchain-based marketplace extends the concept of a single decentralized, distributed ledger to commercial transactions across multiple networks. It’s a peer-to-peer

environment that can both reduce reliance on intermediaries and connect consumers and producers.

In fact, a blockchain marketplace has much in common with other online platforms. Producers provide product or service information, including certificates of origin, verified service level agreement details, and shipping details, such as bills of lading. Consumers and retailers shop for merchandise and services, and make purchases (see Figure 3). It’s a sandbox in which all parties interact by rules they’ve established together in the form of data governance, with no third-party oversight or regulation required. Over time, this collaborative “rulebook” could reduce in size, especially as regulators align on the veracity of digital contracts.

Table 1

Separate but not equal: Blockchain-enabled versus traditional marketplaces¹⁵

Blockchain-enabled marketplace	Traditional marketplace
Neutral governance that promotes unified standards. Interoperability with other networks.	Lack of unified technical and legal standards. Marketplaces disconnected from each other.
Digitally coded and signed smart contracts with no intermediary.	Third-party involvement and high dependency on paper.
Use of digital currency with low or no transaction fees.	Use of payment systems or credit cards, charging a percentage of each transaction.
Instant, intermediary-free payments. Streamlined trade finance.	Leverages third-party financial services. Complex financial transactions.
Provides transparency and easy access to feedback, such as delivery tracking and participant reputation.	Lack of sales algorithm and other seller and logistical metrics availability.
Data that cannot be deleted or changed. Network validation to help prevent fraud. Enhancement of data security and participant willingness to share.	Information more easily hacked. Increased participant concerns over sensitive data.
Does not require personal information.	Requires personal information.

Organizations report using blockchain to exchange data as an asset more than to exchange physical or financial assets.

Figure 3

Dynamic matching of supply and demand in a trusted blockchain-enabled marketplace powered by blockchain, predictive analytics, cognitive, IoT, and more



Source: IBM Institute for Business Value analysis.

Data: To share or to hold?

The blockchain marketplace evokes a range of reactions, depending on the role an organization plays. Today, Builders conduct about 14 percent of their business on blockchain, double that of the Joiners. This makes sense, given that Builders are further along in their relationship with blockchain and are also focused on an industry they

know well—their own. As networks mature over the next three years, Joiners expect their business on blockchain to increase by 60 percent. Organizations across all roles recount using blockchain to exchange data as an asset more than to exchange physical or financial assets or services.

Still, the willingness to share data in exchange for value varies, even as more than 75 percent of organizations say having trusted data is important to their organization. For instance, Joiners are the least likely to share data or offer value in exchange for data (see Figure 4). This lack of trust in sharing could stem from concerns over both security and privacy, as well as the asymmetry in monetizing data in an equitable manner. Yet to succeed in the global marketplace, organizations need to understand both when to hold their data close to the vest—and when it behooves them to share. Joiners may need to fully grasp the negative competitive impact caused by keeping too tight a grip on their data. This, in turn, could prompt a more nuanced approach.

Across all three groups, at least seven in ten organizations expect customers to demand greater transparency and privacy in exchange for their data. The respondents in our survey are global, yet this finding aligns almost exactly with reports that seven in ten Americans say their data is less secure today than five years ago.¹⁶ Almost nine in ten Builders anticipate that their customers will hold higher

expectations related to data exchange. This could be because Builders are more integrated within specific industries and therefore better versed in user preference.

A blockchain marketplace’s emphasis on transparency, data integrity, and network validation—as well as not requiring personal information—could hold increasing appeal for roles that value data privacy, whether Joiners, Builders, or Expanders. And with more data guardrails in place, organizations could be more at ease taking their marketplace global.

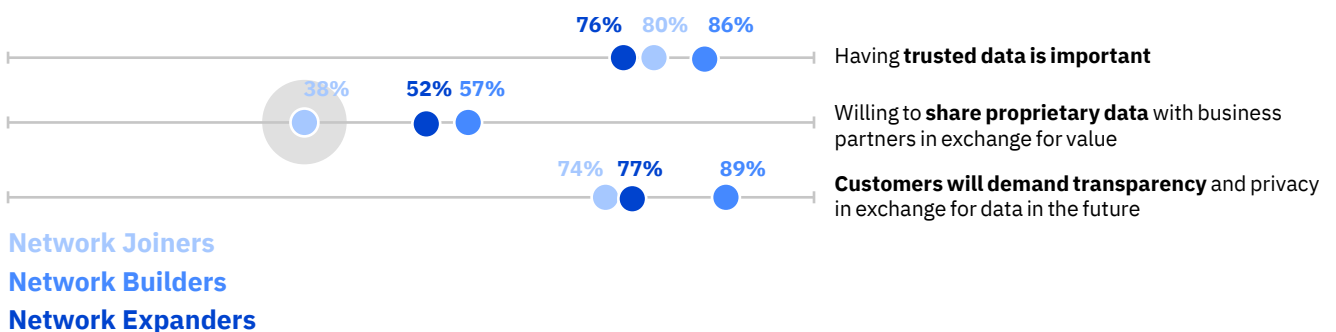
Inter-related: Network roles and blockchain value

To the extent that Joiners, Builders, and Expanders participate in a blockchain-enabled marketplace, they perceive different sources of value. Builders and Expanders see the greatest value in incentivizing consumer behaviors in small but incremental ways, as well as tokenizing assets exchanged on the marketplace. For example, precious metals, carbon credits, and mortgages are already being tokenized on blockchain marketplaces.¹⁷

—

Figure 4

Perceptions on the role of data vary by type of organization



Q. To what extent do you agree with the above statements about trusted data?

Organizations are evaluating metrics portfolios that extend beyond their own profitability.

One Builder, Honeywell, an American multinational, created a blockchain-based marketplace for used aerospace parts. This USD 4 billion industry deals with expensive equipment and adheres to stringent safety requirements. Honeywell developed a GoDirect Trade platform that compiles lifecycle data about aircraft parts and makes this data available to potential buyers. In its initial year, GoDirect Trade handled more than USD 5 million in transactions.¹⁸ While Joiners also acknowledge the marketplace role in incentivizing consumer behavior, they see greater value in buying and selling digital services and the greater shared value possible on a marketplace (see Figure 5). Accordingly, in this GoDirect Trade platform scenario, Joiners would be potential buyers of aircraft parts.

Growth benefits many members of a marketplace. For example, over 50 percent of organizations interacting in a blockchain marketplace expect profit pools driven by blockchain to grow as a result of increased market reach and transaction volume.

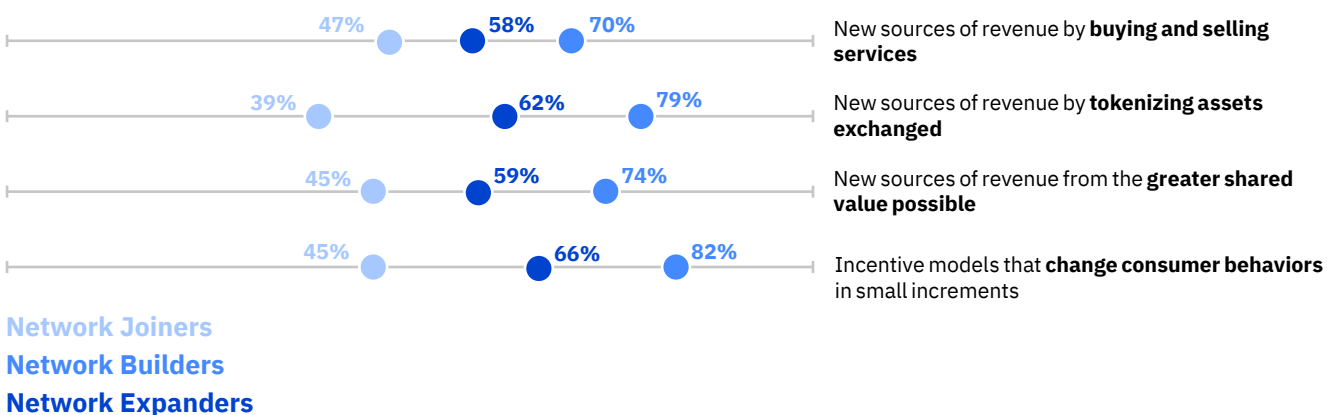
Almost half of all Builders and Expanders also anticipate this increase to arise from new types of transactions with existing partners. They are already planning to collaborate with their current networks to offer new services and innovation to the marketplace. Some of these changes to existing profit pools are expected to increase as blockchain solutions pair more effectively with other emerging technologies. And 67 percent of surveyed organizations expect AI and IoT to be the top accelerators of blockchain-enabled marketplaces in the future.

Beyond profits: A holistic blockchain-driven metrics portfolio

By the very nature of blockchain networks, members are already part of designing and creating the marketplace and have a stake in its success. There is a collective optimism, rather than just the Builders' belief that their new product, service, network, or marketplace will succeed. And as many networks interconnect across marketplaces, organizations are evaluating metrics portfolios that extend beyond their own profitability.

Figure 5

Organizations see different sources of value through participating in a blockchain-enabled marketplace



Q. To what extent do you agree with the above statements about organizations interacting in a blockchain-enabled marketplace?

For example, customer satisfaction ranked first across all three groups as a key performance indicator (KPI) of an organization's operational success across blockchain networks. Joiners highly valued community engagement, which speaks to their participatory status. Partner profitability ranked high among Builders, perhaps a result of their more insular industry focus. Expanders prioritized shareholder value higher than the other groups.

In a blockchain-empowered marketplace, the three types of organizations come together to dynamically satisfy customer requirements in close to real time, inherently helping them achieve their profitability, as well as their newly prioritized KPIs.

Significantly, beyond benefiting their organization or network across KPIs, most organizations expect blockchain to move the overall global economic needle. Almost 90 percent of organizations surveyed expect a one to ten percent boost in global GDP from blockchain-enabled marketplaces over the next ten years.

In both the short- and long-term, blockchain's role in infusing systems and processes with enhanced security, stability, and flexibility still points to a positive impact on the overall global GDP—even in the midst of current uncertainties. One example of the technology's influence: The US Department of Homeland Security cited blockchain managers in agricultural and food distribution as "critical infrastructure workers" during the COVID-19 crisis.¹⁹

Organizations across all groups report that a majority of their business operations are *within their own country*. For large and small companies alike, taking their goods and services across borders could seem daunting, given the nonvisible frictions that persist such as paperwork, procedures, administrative formalities, and more. But as blockchain adoption grows, that wariness may ease.

Action guide

Trusted marketplaces: Toward a data-driven blockchain economy

Data is gold, but that doesn't mean you hoard it. Reap the benefits of sharing data when appropriate, but also hold back when warranted. Here are concrete steps to creating a robust blockchain data strategy:

- 1. Consider what portfolio assets can be digitized and traded in a trusted environment.** Sharing data on a blockchain marketplace can create competitive advantage—as long as proprietary information remains strictly off limits. Assets that are otherwise difficult to trade lend themselves well to being tokenized and offered on a blockchain marketplace. Design a nuanced approach that protects data when needed and gleans value from data when warranted.
- 2. Evaluate which markets you could access through participation and data sharing in a global blockchain network.** Whether offering new services, digitizing assets, or influencing consumer behavior, determine the best path to value from a trusted marketplace. Model alternate revenue streams based on increased market reach and transaction volumes. Identify new ways to collaborate and explore accelerating blockchain solutions with emerging technologies like AI and IoT.
- 3. Transcend profitability metrics.** Investigate how information exchanged on a blockchain marketplace can drive greater customer satisfaction and more. For example, customers can have confidence in their food source and the authenticity of consumer goods. Additionally, investigate how blockchain can help you drive partner profitability, shareholder value, and community engagement—all priorities for Builders, Expanders, and Joiners respectively.

“Post crisis, it is going to be critical for governments, companies, and industry actors to connect ‘digital islands’ and enable the digital trade system. Blockchain is going to play a hugely important role in making this a reality.”

Michael Vrontamitis, Head of Trade, Europe and Americas at Standard Chartered Bank, UK

A neutral entity: The global, interconnected blockchain

Doing business globally requires trust—an abundance of it. For blockchain-enabled marketplaces to gain widespread, diverse participation, they’ll need trusted, equitable, neutral governance. Here’s the good news: blockchain actually *becomes* that custodian of trust—no intermediaries required. Michael Vrontamitis, Head of Trade, Europe and Americas at Standard Chartered Bank in the UK, observes, “In our pursuit of trade digitization, we never imagined that the inability to connect ‘digital islands’ would be a concern for the millions of people who need to process the billions of physical pieces of paper in trade. While we have seen digital ‘hacks’ to get us through, this comes with increased risk. Post crisis, it is going to be critical for governments, companies, and industry actors to enable the system to be natively digital. Blockchain is going to play a hugely important role in making this a reality.”

The next iteration: An interconnected future

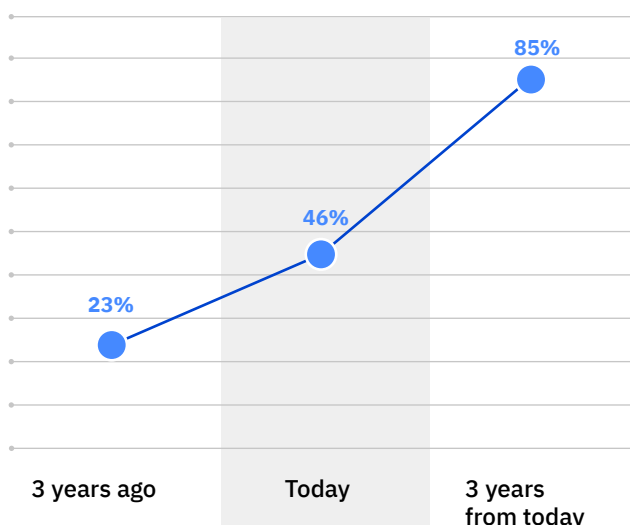
Consider this: launching an online business once involved planning the technical aspects of website hosting and data transfers. These are now standardized globally through domain name registries, freeing companies to focus on demographics and other marketing strategies.

A similar parallel is happening with blockchain. While less than half of all surveyed organizations (46 percent) are working with multiple blockchain technologies today, the vast majority (85 percent) plan to do so over the next three years. Organizations are gearing up to conduct more business across a marketplace of blockchain networks that, ideally, will have the appropriate technical infrastructure to span multiple ecosystems. In preparation, Chief Technology Officers (CTOs) and Chief Information Officers (CIOs) in all three respondent groups are prioritizing scalability, interoperability, and integration over the next one to three years (see Figure 6).

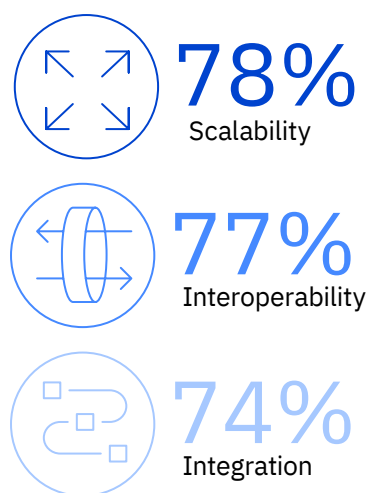
Figure 6

Organizations are aligning priorities to support the adoption of multiple blockchain technologies

Working with more than one blockchain technology



CTOs and CIOs prioritize blockchain features for implementation



Q. How many blockchain technologies is your organization actively working with? (n=917)

Q. How important are the above features for a blockchain environment’s implementation at your organization in the next 1–3 years? (n=182)

While 63 percent of Joiners, Builders, and Expanders alike are on single public or private blockchain networks today, they plan to increasingly work on multiple interconnected blockchain networks in the next three years. As organizations navigate this complex framework, they expect some synergy in the form of common services. For example, organizations report that basic services such as inventory management, asset management, and supplier certification are important criteria for joining a blockchain network, because they contribute to operational and cost efficiencies.

Other services like Know Your Customer (KYC) and digital identity are typically seen as part of the onboarding package and need to be accounted for as well. For instance, blockchain-enabled marketplaces could help bridge some of the USD 1.5 trillion trade finance gap resulting from KYC issues by providing detailed transaction histories to help assess risk.²⁰

What’s more, as cloud adoption continues to rise, over the next three years organizations anticipate their blockchain environment will comprise a hybrid mix of on- and off-premise cloud services—and will do so at more than 3.5 times their rate today. These are all developments that bode well for adapting and scaling to global marketplaces and their complexities.

Overall, blockchain networks are better positioned for success in global trade if they can accommodate future interconnectedness and interoperability—and Builders and Expanders need to plan accordingly.

**Growing the blockchain marketplace:
Influencing new membership**

Overall, market leaders, regulators, and industry bodies such as trade groups are expected to play an important role in establishing trusted blockchain-enabled marketplaces (see Figure 7).

Builders and Expanders are more optimistic than Joiners about a prominent role for regulators in setting up these cross-border, cross-industry marketplaces. One factor could be anticipating regulatory modifications. For

example, Builders and Expanders could seek potential modification of the United Nations Commission on International Trade Law (UNCITRAL).²¹ From a network perspective, this would help ensure digital contracts have the same legal veracity as paper contracts. Governments can also promote GDP growth by modifying law that relates to digital contracts. These automated contracts and other blockchain-based improvements can facilitate 50 to 80 percent in operating cost savings associated with trade finance and can stimulate new business partnerships.²²

By virtue of the “constructor” nature of their roles, Builders and Expanders report prioritizing increasing membership and supporting new applications and services on their blockchain networks. And as with any marketplace, influencers impact membership of blockchain forums, too. Organizations surveyed agree that blockchain academia is most critical to inspiring diverse membership on the marketplace.

—

Figure 7

Organizations look to different entities to take the lead for blockchain-enabled marketplaces to thrive



Q. How important are the above organizations toward enabling a trusted blockchain-enabled marketplace?

To nurture a growing marketplace, it's critical to drive interoperability across the various systems that allow transactions to flow.

Joiners, Builders, and Expanders alike agree that to thrive and facilitate creative exchange, these marketplaces need open governance and standards in addition to common services. So it's no surprise that they're all looking to regulators and governments, as well as standards bodies, for this purpose.

To nurture a growing marketplace, it's critical to drive interoperability across the various systems that allow transactions to flow, whether on or off blockchain. Organizations we surveyed are counting on blockchain consortia, blockchain academia, and market leaders to come up with the answers. Builders, in particular, are also looking to international trade organizations to drive interoperability. These organizations are already skilled at finding common ground with their members.

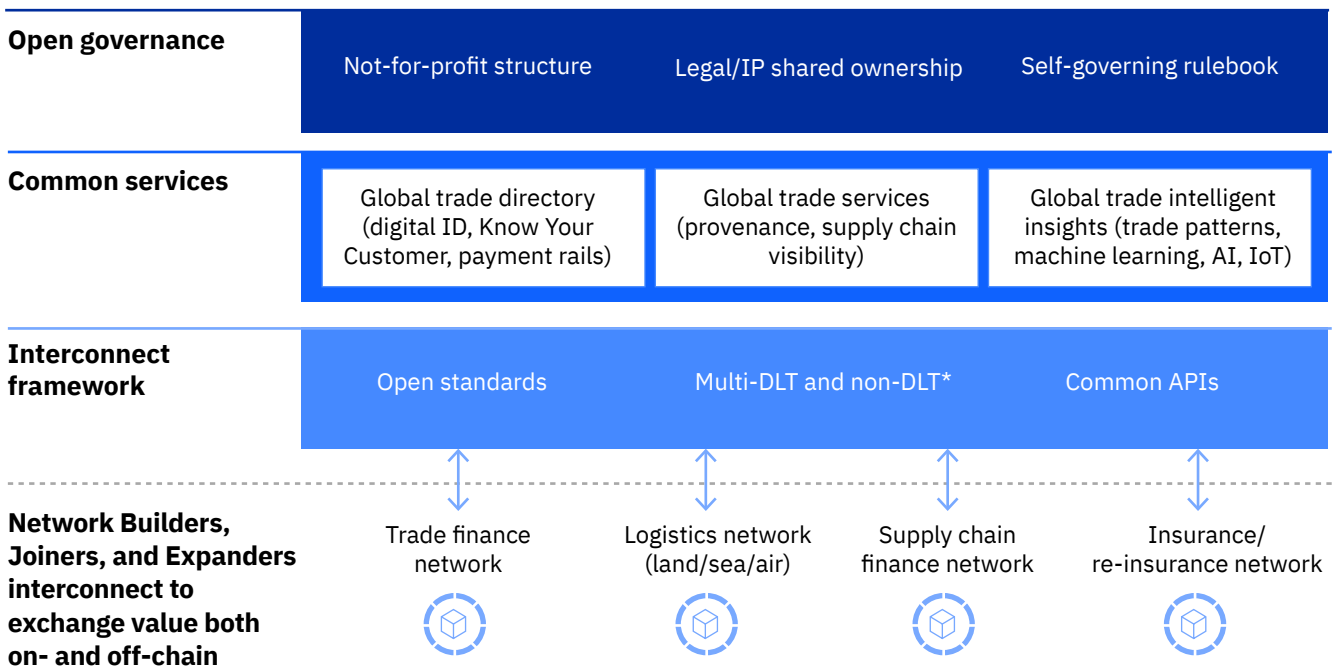
Earning trust in global trade

By its very nature, blockchain promotes decentralization. However, organizations still expect some oversight to help promote equitability and build trust. Especially as marketplaces expand to new geographies and industries, blockchain networks need to accommodate many more regulatory and cross-border challenges. For example, the IBM Food Trust blockchain network had to meet local privacy requirements when it expanded to European countries.

A neutral entity can help drive fair, open governance and, in the absence of "absolute" standards, begin the journey to standardization—a critical foundation to unleashing the value from blockchain-driven marketplaces in global trade (see Figure 8).

Figure 8

A neutral entity can help drive fair, open governance and standards in a blockchain-enabled marketplace



*Distributed ledger technology

Source: IBM Institute for Business Value analysis.

An effective way to define a neutral entity is by illustrating potential services that it could offer:

- A *global trade directory service* could be the trusted authority for buyers or sellers—or importers or exporters—seeking trade counterparties that are onboarded and receive a verified digital identity.
- A *global trade services platform* could provide common trade services that cost-effectively enable the exchange and provenance verification of goods and services, which are tracked while being transported among parties.
- A marketplace offering *global trade intelligent insights* could provide trusted “smart services” that yield insights into global trade patterns, perhaps as a pure “search and discover” platform through a Trusted Data Repository Service.

Far from exhaustive, these examples show how a trusted neutral entity levels the playing field. The very processes that created nonvisible frictions now become common services *required* by blockchain stakeholders. Think asset management, claims and customs processing, supplier certification, inventory management, and digitization and automation of trade finance processes. Invisible trade-busting frictions are no longer an option. And, as trade processes are digitized, organizations also see their assets being digitized, tokenized, and traded with equal fervor as their original goods.

Blockchain-enabled marketplaces empower. An organization no longer needs to be a multinational conglomerate with a sophisticated infrastructure of international contacts and services to compete in the global market. As Emmanuelle Ganne of the WTO observes, “Blockchain could well become the future of trade infrastructure and the biggest disruptor to the shipping industry and international trade since the invention of the container.”²³

Action guide

A neutral entity: The global, interconnected blockchain

You may begin by joining one siloed blockchain, but that’s not the way of the future. Eventually, you’ll want to plug and play across multiple networks, and you’ll need astute governance and standards to do so. Here is some advice to take you forward:

- 1. Remember the “three I’s”: integrate, interconnect, interoperate.** Think broadly and develop strategies that can eventually scale to a wider set of blockchain technologies. Without governance and standards, you risk multiple blockchain networks that duplicate one another, fail to span industry and global boundaries, and are limited to a single technology.
- 2. Envision networks and value chains that are matrixed, not linear.** Designing for the “three I’s” means that no matter what your network role, you can connect to a neutral “network of networks”—or help build it. Determine realms of expertise that you can benefit from, contribute to, or create. In what domain are you the trusted authority, or could be, with access to the right data? Be alert to common services that you can develop or transactions that you can track. Investigate what insights you can deliver—and monetize.
- 3. To achieve the greatest impact on global trade, aggregate activities at a cross-industry level.** Yes, industry-specific activities have their benefits. But as you connect across multiple blockchains, determine what synergies matter most. Incorporate them into your network as common, easily adaptable services. Engage with regulators, government bodies, academia, industry working groups, and trade organizations to drive interoperability across networks and facilitate cross-industry adoption, thus increasing chances of marketplace success.

Research methodology

In December 2019, the IBV, in cooperation with Oxford Economics, interviewed more than 1,000 executives from 34 countries and 22 industries. The IBV conducted in-depth telephone surveys to examine the value gained from interconnected blockchain marketplaces and their role in facilitating global trade. Respondents in our study include a mix of C-suite executives, business unit leaders, and executives responsible for strategic alliances and partnerships. All survey respondents represent organizations with annual revenue greater than USD 250 million and are currently working with or planning to invest in blockchain over the next three years. Additionally, all respondents are involved in their organizations' blockchain strategies and investments.

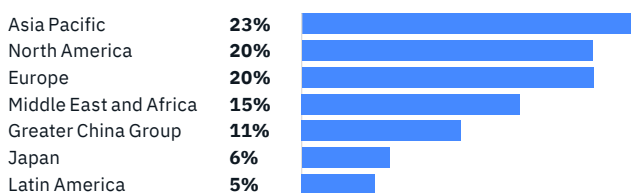
We used a two-step cluster analysis to classify participating organizations into one of four distinct groups. These groups were determined by utilizing a base variable set comprised of three questions: an organization's role in a blockchain network, an organization's governance priorities in a blockchain network, and an organization's motivation for a blockchain-enabled marketplace.

Two of the four types were not remarkably distinct in their responses to the base variables and were therefore treated as a single group for analytic comparison purposes. The result: three types of organizations that were both homogeneous within their groups and sufficiently heterogeneous compared to other groups.

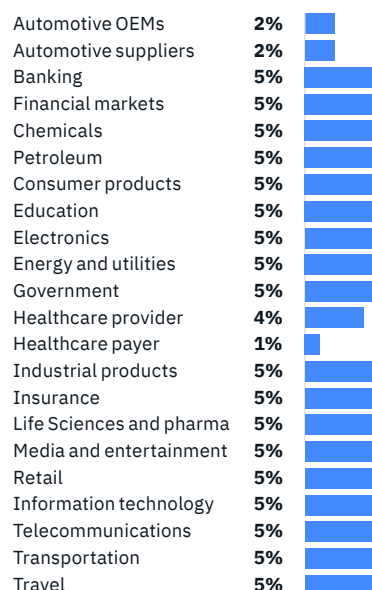
Within our research, we explicitly defined the following terms:

- *Integration*: How blockchain networks connect to other applications or systems, both internal and external, that an organization uses.
- *Interconnectivity*: How one blockchain network connects to another blockchain network at the application layer via APIs.
- *Interoperability*: How blockchain networks connect at the DLT layer.
- *Blockchain-enabled marketplace*: A trusted heterogeneous environment where buyers and sellers can exchange value (goods, services, and payment) via common and interoperable business services and applications governed for privacy and security.

Respondents by country



Respondents by industry



About the authors



Parm Sangha

[linkedin.com/in/parm-sangha-65a3464](https://www.linkedin.com/in/parm-sangha-65a3464)
parm.sangha@uk.ibm.com

As the Global Blockchain Leader for Trade and Trade Finance, Parm is responsible for blockchain strategy and execution with IBM Global Business Services. He works with clients to facilitate low-friction trade and trade finance networks using blockchain capabilities. Parm has also partnered with Europe's leading banks to enable we.trade, the world's first blockchain-enabled trade finance platform. He is a member of the International Chamber of Commerce's Digital Working Group for Trade Digitization, as well as an active participant and speaker at industry events.



Veena Pureswaran

[linkedin.com/in/veenapureswaran/](https://www.linkedin.com/in/veenapureswaran/)
vpures@us.ibm.com

Veena is an Associate Partner and Global Research Leader for blockchain and emerging technologies with the IBM Institute for Business Value. She is among the first to publish business research in blockchain and leads a global research program on reinventing enterprises, ecosystems, and economies with this technology. Veena holds six patents and was named among the top 200 thought leaders in crypto and blockchain in 2018. Veena has presented at over 40 major conferences in Asia, Europe, and North America.



Smitha Soman

[linkedin.com/in/smithasoman/ssoman@us.ibm.com](https://www.linkedin.com/in/smithasoman/ssoman@us.ibm.com)

Smitha is a blockchain strategy consultant with the IBM Institute for Business Value. She has created more than twenty pieces of business research and thought leadership charting the evolution of blockchain and its strategic application. She is a passionate advocate for blockchain's potential to transform business as usual and uses every opportunity to share her expertise at various IBM and external business conferences. Smitha is a computer engineer, a trained IBM Design Thinking practitioner, and a Lean Six Sigma Black Belt.

Contributors

For their in-depth insights and collaboration, our special thanks go out to IBM blockchain experts Ram Viswanathan, Pramod Achanta, Hyman Chantz, Andrew Martin, and Andrew Graham, as well as to IBV associate research fellow Lauren Huber.

Related reports

Ramamurthy, Shanker, Veena Pureswaran, et al. **“Fast forward: Rethinking enterprises, ecosystems and economies with blockchains.”** IBM Institute for Business Value. June 2016. <https://www.ibm.com/thought-leadership/institute-business-value/report/blockchain>

Martin, Andrew, Shyam Nagarajan, Veena Pureswaran, and Smitha Soman. **“Building your blockchain advantage: Fresh insights on how to create value, scale fast and open new markets.”** IBM Institute for Business Value. November 2018. <http://ibm.biz/blockchainbizmodel>

Wieck, Marie and Jerry Cuomo. **“Blockchain as a force for good: Five principles to build trust and real value.”** IBM Institute for Business Value. September 2019. <https://ibm.co/blockchain-principles>

The right partner for a changing world

At IBM, we collaborate with our clients, bringing together business insight, advanced research, and technology to give them a distinct advantage in today’s rapidly changing environment.

IBM Institute for Business Value

The IBM Institute for Business Value, part of IBM Services, develops fact-based, strategic insights for senior business executives on critical public and private sector issues.

For more information

To learn more about this study or the IBM Institute for Business Value, please contact us at iibv@us.ibm.com. Follow @IBMI BV on Twitter, and, for a full catalog of our research or to subscribe to our monthly newsletter, visit: ibm.com/ibv.

Notes and sources

- 1 “Another lacklustre year of economic growth lies ahead.” *The Economist*. January 1, 2020. <https://www.economist.com/graphic-detail/2020/01/01/another-lacklustre-year-of-economic-growth-lies-ahead>
- 2 Ganne, Emmanuelle. “Can Blockchain revolutionize international trade?” World Trade Organization. 2018. https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf
- 3 “Trade facilitation.” World Trade Organization. Accessed April 20, 2020. https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm
- 4 Ramamurthy, Shanker, Veena Pureswaran, et al. “Fast forward: Rethinking enterprises, ecosystems and economies with blockchains.” IBM Institute for Business Value. June 2016. <https://www.ibm.com/thought-leadership/institute-business-value/report/blockchain>
- 5 Martin, Andrew, Shyam Nagarajan, Veena Pureswaran, and Smitha Soman. “Building your blockchain advantage: Fresh insights on how to create value, scale fast, and open new markets.” IBM Institute for Business Value. November 2018. <https://www.ibm.com/thought-leadership/institute-business-value/report/blockchainbizmodel>
- 6 “General Data Protection Regulation (GDPR).” GDPR.EU. Accessed April 15, 2020. <https://gdpr.eu/tag/gdpr/>
- 7 “Digital Trade Standards Initiative launches under the umbrella of ICC.” International Chamber of Commerce. March 3, 2020. <https://iccwbo.org/media-wall/news-speeches/digital-trade-standards-initiative-launches-under-the-umbrella-of-icc/>
- 8 “What is a J curve?” Corporate Finance Institute. Accessed on April 14, 2020. <https://corporatefinanceinstitute.com/resources/knowledge/economics/j-curve/>
- 9 Liu, Shanhong. “Worldwide spending on blockchain solutions from 2017 to 2023.” Statista. November 28, 2019. <https://www.statista.com/statistics/800426/worldwide-blockchain-solutions-spending/>
- 10 “IDC Expects Worldwide IT Spending to Decline by 2.7% in 2020 as COVID-19 Drives Down Forecasts.” IDC Media Center. April 2, 2020. <https://www.idc.com/getdoc.jsp?containerId=prUS46186120>
- 11 Anzalone, Robert. “IBM’s Growing Blockchain Networks Could Strengthen Our Supply Chain In Response To COVID-19.” Forbes.com. April 8, 2020. <https://www.forbes.com/sites/robertanzalone/2020/04/08/ibms-growing-blockchain-networks-could-strengthen-our-supply-chain-in-response-to-covid-19/#1119cc567be1>
- 12 “IBM Food Trust Expands Blockchain Network to Foster a Safer, More Transparent and Efficient Global Food System.” IBM News Room. October 8, 2018. <https://newsroom.ibm.com/2018-10-08-IBM-Food-Trust-Expands-Blockchain-Network-to-Foster-a-Safer-More-Transparent-and-Efficient-Global-Food-System-1; “IBM Food Trust. A new era for the world’s food supply.” IBM Blockchain. Accessed April 10, 2020. https://www.ibm.com/blockchain/solutions/>

food-trust; “How Walmart brought unprecedented transparency to the food supply chain with Hyperledger Fabric.” Hyperledger. Case study. Accessed April 10, 2020. <https://www.hyperledger.org/resources/publications/walmart-case-study>; “Farmer Connect Uses IBM Blockchain to Bridge the Gap Between Consumers and Smallholder Coffee Farmers.” IBM News Room. January 6, 2020. <https://newsroom.ibm.com/2020-01-06-Farmer-Connect-Uses-IBM-Blockchain-to-Bridge-the-Gap-Between-Consumers-and-Smallholder-Coffee-Farmers>

- 13 Martin, Andrew, Shyam Nagarajan, Veena Pureswaran, and Smitha Soman. “Building your blockchain advantage: Fresh insights on how to create value, scale fast, and open new markets.” IBM Institute for Business Value. November 2018. <https://www.ibm.com/thought-leadership/institute-business-value/report/blockchainbizmodel>
- 14 “we.trade: Helping companies trade seamlessly with IBM Blockchain.” IBM case study. Accessed April 8, 2020. <https://www.ibm.com/case-studies/wetrade-blockchain-fintech-trade-finance>
- 15 H., Tania. “Why Should You Consider Implementing Blockchain Technology in Your Marketplace?” RubyGarage. January 27, 2020. <https://rubygarage.org/blog/how-blockchain-impacts-marketplace>
- 16 Auxier, Brooke, Lee Rainie, Monica Anderson, Andrew Perrin, Madhu Kumar, and Erica Turner. “How Americans think about privacy and the vulnerability of their personal data.” Pew Research Center: Internet and Technology. November 15, 2019. <https://www.pewresearch.org/internet/2019/11/15/how-americans-think-about-privacy-and-the-vulnerability-of-their-personal-data/>
- 17 Lund, Jesse, Shanker Ramamurthy, and Bridget von Kralingen. “Moving to a token-driven economy: Enabling the digitization of real-world assets.” IBM Institute for Business Value. May 2018. <http://ibm.biz/tokenconomy>
- 18 del Castillo, Michael and Matt Schiffrin, eds. “Forbes Blockchain 50.” *Forbes*. January 2020. <https://www.forbes.com/sites/michaeldelcastillo/2020/02/19/blockchain-50/#4f5b58567553>
- 19 “US Homeland Security lists blockchain as Covid-19 critical service.” Ledger Insights. March 20, 2020. <https://www.ledgerinsights.com/us-homeland-security-lists-blockchain-as-covid-19-critical-service/>
- 20 Fletcher, Laurence. “Forget the paper trail — blockchain set to shake up trade finance.” *Financial Times*. December 2, 2019. <https://www.ft.com/content/04a4fcde-dfb5-11e9-b8e0-026e07cbe5b4>
- 21 “United Nations Commission on International Trade Law.” United Nations. Accessed April 15, 2020. <https://unctad.un.org/>
- 22 Olsen, Thomas, Ada Di Marzo, Sen Ganesh, and Mike Baxter. “Wolf in Sheep’s Clothing: Disruption Ahead for Transaction Banking.” Bain & Company. May 16, 2018. <https://www.bain.com/insights/disruption-ahead-for-transaction-banking/>
- 23 Ganne, Emmanuelle. “Can Blockchain revolutionize international trade?” World Trade Organization. 2018. https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf

About Research Insights

Research Insights are fact-based strategic insights for business executives on critical public and private sector issues. They are based on findings from analysis of our own primary research studies. For more information, contact the IBM Institute for Business Value at iibv@us.ibm.com.

© Copyright IBM Corporation 2020

IBM Corporation
New Orchard Road
Armonk, NY 10504

Produced in the United States of America
May 2020

IBM, the IBM logo, and ibm.com are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at “Copyright and trademark information” at www.ibm.com/legal/copytrade.shtml.

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED “AS IS” WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OR CONDITION OF NON-INFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements under which they are provided.

This report is intended for general guidance only. It is not intended to be a substitute for detailed research or the exercise of professional judgment. IBM shall not be responsible for any loss whatsoever sustained by any organization or person who relies on this publication.

The data used in this report may be derived from third-party sources and IBM does not independently verify, validate or audit such data. The results from the use of such data are provided on an “as is” basis and IBM makes no representations or warranties, express or implied.

33032033USEN-00

