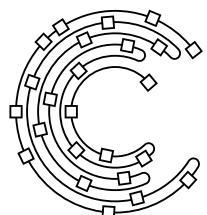


# Forward Together

Three ways  
blockchain Explorers  
chart a new direction

Global C-suite Study  
19th Edition

IBM Institute for  
Business Value



## How IBM can help

This report draws on input from 2,965 conversations with C-suite executives (CxOs) from January through March 2017. It is the nineteenth in our ongoing series of CxO studies from the IBM Institute for Business Value (IBV), and we have now had conversations with more than 31,000 CxOs stretching back to 2003. Here, we focus on executive perspectives about blockchain as a technology enabler for Digital Reinvention.

See [ibm.com/globalcsuitestudy](http://ibm.com/globalcsuitestudy)

IBM provides clients the consulting and systems integration capabilities to design and rapidly adopt distributed ledgers, digital identity and blockchain solutions. Learn more at [ibm.com/blockchain](http://ibm.com/blockchain)

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## The point of departure

Successive waves of technology and the decades of transformative change that come in their wake are sure to shake something free. For the leaders taking up blockchain technology, that might be a mindset best characterized as open. The unknown, instead of inducing discomfort, inspires their strategy. The capacity to learn fast is as valued as the capability to move fast. As the boundaries among industries continue to blur, they stand ready to rip them open. Innovating in tandem with peers and partners, they are poised to break away.

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## An unexpected evolution

Sometimes what is old can become radically new again. Trust is one of those concepts. The need for the codification of trust arose centuries ago as the first global trade routes were established. Today, intermediaries take on the role of trustkeepers. We pay them to monitor, certify and inspect. Notaries stamp physical papers, keeping many of the transactions associated with trade offline and inefficient.

On a blockchain, data can be shared in real time across a scalable group of individuals and institutions. Every event or transaction is time-stamped and becomes part of a long chain, or permanent record, that can't be tampered with after the fact. On permissioned blockchains, privacy can be maintained by agreement about which parties can view which transactions—and where desired, by masking the identity of the party.

“At its core, blockchain is a shared ledger that allows participants in a business network to transact assets where everyone has control, but no one person is in control.”

Leanne Kemp,  
Chief Executive Officer and Founder,  
Everledger, United Kingdom

Figure 1

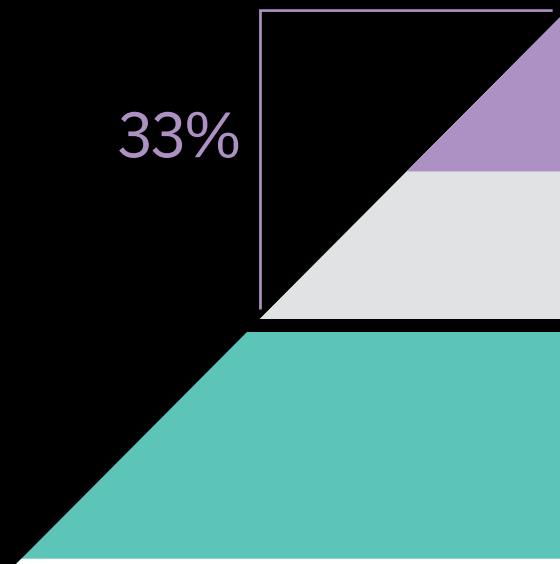
**Explorers:**  
Already active  
in blockchain

**Investigators:**  
Considering blockchain

**Passives:**  
Not considering  
blockchain

## Out of the gate

Organizations across  
regions and industries  
take up blockchain



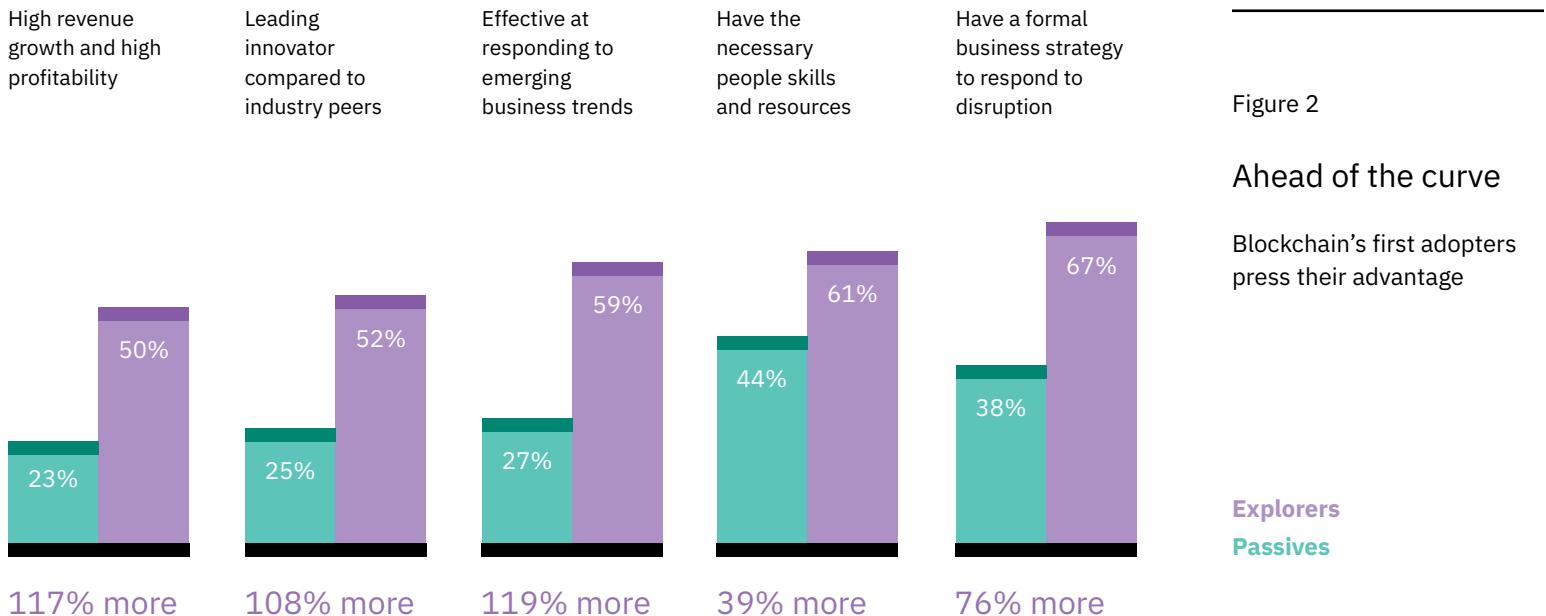
Trust can be embedded into blockchain transactions.  
As it does, new transformative possibilities emerge.

In our survey of almost 3,000 global C-suite executives, we found that a significant 33 percent of organizations, on average, across all industries and regions are already considering or actively engaged with blockchains (see Figure 1). Of particular interest in this study are those organizations that are already experimenting with, piloting or implementing blockchains—we call them the Explorers.

Their numbers, of course, vary by industry. As in earlier IBV industry perspectives on blockchain, we see high activity in several industries.<sup>1</sup> In banking and financial markets for example, the Explorers alone already make up one-third of those considering or actively engaged with blockchains. This suggests a steady growth in blockchain activity in industries early out of the gate.

Across all 20 surveyed industries, the Explorers make up an average of 8 percent. No matter what the industry, the Explorers are remarkably alike. They share similar plans and attitudes, including a confidence in technology. “Technology innovation,” as one Explorer CHRO from New Zealand in the IT and Professional Services industry said, “has the potential to future-proof the company to deliver on new market demands and create new offerings established via an ecosystem.” These and other characteristics are starkly different for those organizations not yet considering blockchain—the Passives.

The Explorers identified in this study turned out to be the most distinct group of organizations we've seen in 15 years of C-suite primary research. That distinction starts with their competitive position. They are more often leaders in their industries, as measured by revenue and profit growth, as well as by innovation. These venturesome organizations also report that they're more adept at responding to emerging business trends. They are confident they have the right strategy and resources in place to reinvent themselves—and their industries (see Figure 2).



One challenge Explorers face is that blockchains aren't just new; they're likely to radically change how organizations operate, generate revenues and respond to customers, partners and competitors alike. The new business models that result can evolve in unexpected ways.

For a time, organizations are expected to experiment and test different aspects of new business models to see what works best. For some, a wait-and-see approach to blockchains might be a reason to hang back. The Explorers don't appear to be hesitating. They're poised to press their current advantages to create meaningful distance now.

What can we learn from the Explorers? Our findings are detailed in three chapters:

**Head for the horizon:  
Navigate toward the unknown**

**Build a springboard:  
Aim for new platform business models**

**Raise the tide:  
Shore up your partners and competitors.**

**"Blockchain could help us create new business models with a huge potential to shift profits in a positive direction."**

Chief Marketing Officer,  
Retail, Brazil

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## Head for the horizon: Navigate toward the unknown

Blockchain's early adopters —the Explorers— are turning the uncertainty that comes with digital disruption into their unique advantage. Twice as many Explorers are experiencing disruption in their industries than Passives (see Figure 3). That disruption is also different in kind.

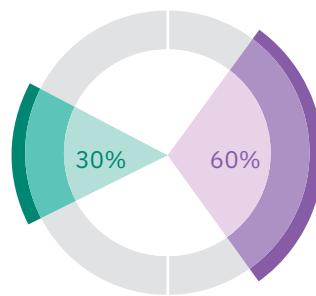
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Figure 3

**Explorers**  
**Passives**

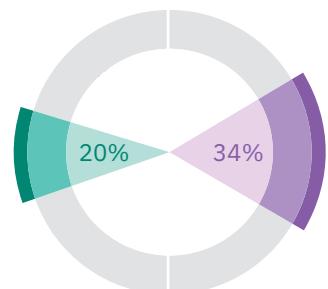
In motion

Explorers confront  
significant disruption



**100% more**

Disruption from within  
their industry



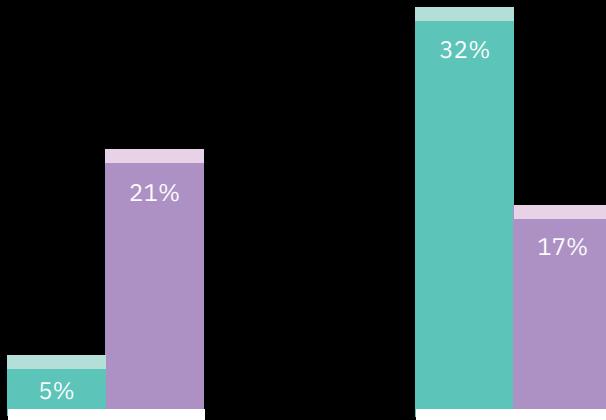
**70% more**

Disruption from  
other industries

Figure 4

**Explorers**  
**Passives**

Plan to disrupt a new market or industry by completely changing the rules of the game



320% more

## Get up and go

Explorers are more likely to disrupt than defend

Significantly more Explorers than Passives anticipate facing competitors from outside their industry. They expect that more of those boundary-jumping organizations will soon be heading their way. Competitors new to an industry, they know, don't often enter a market just to nibble at the margins. More likely, they intend to topple incumbents.

Despite the threats from new competitors, Explorers view disruption as more of a tailwind than a whirlwind. It propels them forward. They told us, in fact, they are far more likely to disrupt than defend. One in five Explorers intends to disrupt a new market or industry by completely changing the rules of the game, compared to just 5 percent of those who aren't yet considering blockchains (see Figure 4). Moreover, 64 percent of Explorers versus 30 percent of Passives stated that they can't afford to wait. They need to begin reinventing their organizations now.

47% less

## The trust accelerator

Data, the Explorers told us, has been their guide. They're twice as likely as Passives to look to data and analytics to inform their strategy. They also turn to technology to transform how they interact and transact with customers much more than the Passives, 74 percent versus 45 percent respectively.

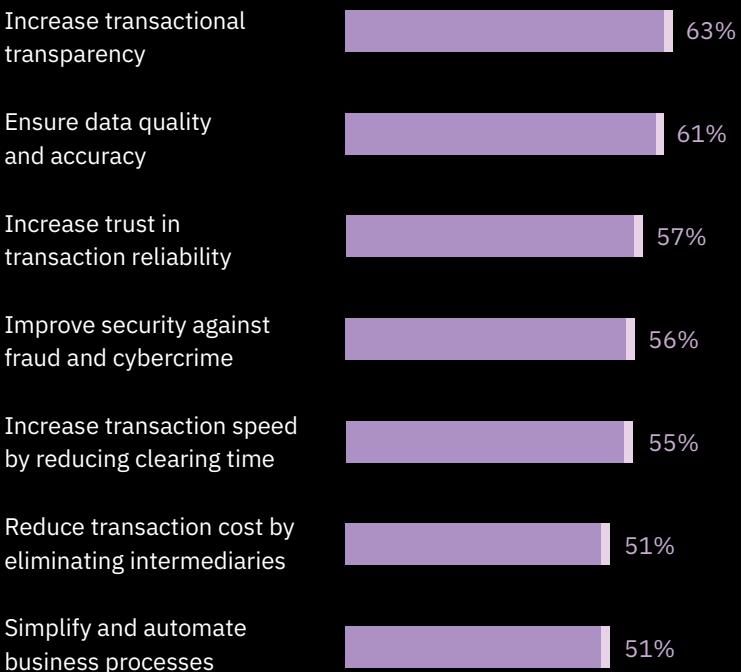
Every single one of the Explorers expects blockchain to support their enterprise strategy in some way. Six in ten Explorers said that blockchain technology best does so by creating more trust and transparency in both data and transactions (see Figure 5).

Blockchains help build trust in several ways. The transparency of transactions establishes a traceable audit trail. "Blockchains will help pharmaceuticals keep up with regulatory requirements," one Life Sciences CEO in India noted. Others expect traceability to improve processes and partner hand-offs. Smart contracts can encode the commitments between parties and help ensure they're kept. Those smart contracts, a Government CIO from the U.S. said, could give them "the power to not only record property rights, but enforce them."

Figure 5

### Explorers

**100% of Explorers expect blockchain to support enterprise strategy in some way**



## Systems of trust

Reputations can be deduced from past behaviors. Does an auto supplier regularly deliver parts on time? Is a start-up truly creditworthy? Blockchain has the potential to democratize ecosystems—making it easier for smaller companies to prove they can be trusted. The reasons to trust can be more easily and exhaustively verified. Data recorded to a blockchain can verify that wine has been shipped and maintained in transit at the proper temperature. As goods in transit clear customs and ports, organizations aware of their location in real time can dynamically optimize their supply chains.

Proving provenance on blockchains is useful for preventing everything from counterfeit semiconductors flooding the market to outbreaks of illness from contaminated foods. In China, where new regulations that include better recordkeeping have been implemented to ensure food safety, Walmart is piloting a program that traces pork from its origins on the farm to the factory and across the supply chain, capturing data like storage temperatures and expiration dates on a blockchain.<sup>2</sup>

**“Blockchain has the potential to build a huge and versatile trust network.”**

Chief Human Resources Officer,  
Electronics, Japan

As we saw in the IBV's industry reports on blockchain, healthcare is setting a fast pace for blockchain adoption in 2017—and for good reason.<sup>3</sup> In what industry could trust matter more? The opportunity is outsized: access to the lifetime history of data associated with a patient is life-changing and something blockchains do exceedingly well.

If every vital sign from a doctor's visit or wearable health device, and records of all medicines taken, illnesses and operations could be securely shared on blockchain, then the quality and coordination of care would be expected to rise and costs to fall. Healthcare CxOs could finally achieve the promise of personalized medicine. More so than Passives, those considering or already active on blockchains told us they expect to introduce patient-centric healthcare and personalized patient services.

**"Blockchain can bring transparency to the supply chain and make our image more trustworthy and reliable."**

Chief Marketing Officer,  
Electronics, Italy

## Ready to pivot

As blockchain increases trust and transparency across value chains, organizations will collaborate and compete in ways that can't yet be foreseen. "The need for trusted intermediaries could become obsolete," said one CFO in Industrial Products from China, a belief echoed by many. As blockchain-supported value chains evolve, many intermediaries will inevitably fall away. However, asset-light start-ups could also flood markets they were once shut out of. Profits may flow to new places or even become quite shallow as lower-cost services proliferate. The boundaries between industries could blur or fall away completely as ecosystems evolve.

Traditionally, first movers expect to gain advantage primarily by locking others out through the control of resources. Early adopters on blockchain are learning that the value to be gained is something more: *being the first to understand what happens next*. As they learn what's newly possible, these first adopters can begin to influence the future direction for blockchain applications and new business models. By being first, the Explorers aren't just jumpstarting the evolution of new business models, they're shaping how they will evolve and the conditions for success.

Explorers appear well-prepared to move fast and as new possibilities emerge, to be ready to pivot again and again. They recognize the need, as one Explorer, Peter Crombecq, a Government CIO from Belgium put it, "to be agile enough to anticipate digital disruption, even without knowing what that disruption may be in the future."

Explorers have a well-defined approach to learning and experimentation. Nearly two-thirds reward fast failure, as well as successful innovation. Over one-half of the Explorers excel at iterating their strategy through rapid prototyping (see Figure 6). They are quintessential design thinkers. Strategic design thinking, says author Steven Johnson, is a method that “starts with humility—the humility of ‘I have approaches but I don’t have the answer.’”<sup>4</sup> The answers are to be found in the doing.

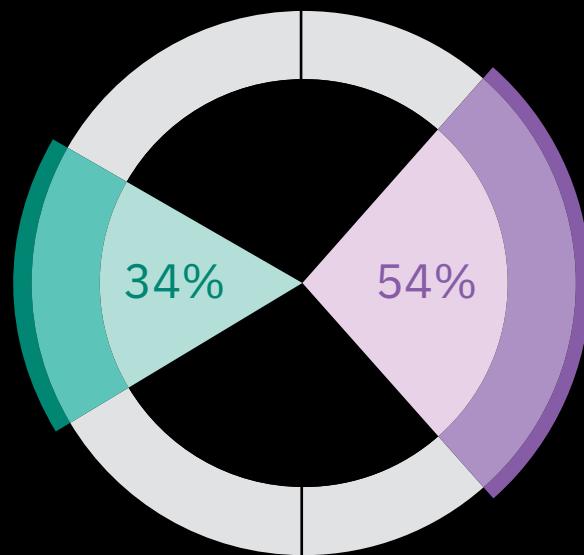
Our C-suite Studies sometimes reveal troubling gaps between business and IT executives. In this instance, it doesn’t. Explorer organizations approach strategy from the perspective of design thinking, with one-half of CIO Explorers saying they’re effective at applying design thinking to their organizations’ IT functions, versus just 29 percent of Passives. Business and IT are beautifully aligned. Or more precisely, at least the half that are looking at blockchain are.

Figure 6

**Explorers**  
**Passives**

Designed for change

Explorers excel at rapid iterative strategy



59% more

Rely to a large extent on rapid prototyping, build-as-you-design, modify-as-you-go approach to strategy

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## Build a springboard: Aim for new platform business models

Blockchains create excellent platforms for new ways of working. Another way to think of them is as springboards, capable of launching organizations in new directions. The Explorers, inclined to think boldly, already have their eyes on what those new directions could be.

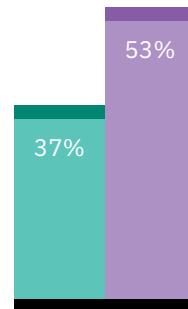
Eight in ten Explorers are investing in blockchain technology in response to profit pools shifting in their industry or the opportunity to develop new business models. They are committed to wholesale reinvention. For those whose business models are under threat, just over one-half of the Explorers expect to launch an entirely new business model in their industry or someone else's, compared to one-third of Passives (see Figure 7).

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Intend to  
launch a new  
business model

Figure 7

All in



43% more

Under threat, Explorers  
are more likely to reinvent  
their business

**Explorers**  
**Passives**

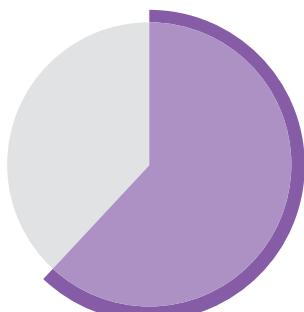
## Open to exchange

Asked which trends will reshape their business models, Explorers identified new ways to monetize and capitalize as the top drivers of change. Six in ten Explorers said alternative payment options and the sharing economy would most influence their strategic direction (see Figure 8).

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Figure 8

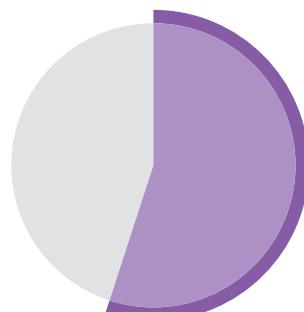
### Explorers



62%  
Alternative payment options

### Pay day

Explorers identify new opportunities to monetize and capitalize their business



55%  
The sharing economy

On blockchains, some Explorers noted, they could support micro-payments and skip the fees imposed by intermediaries. Others reckoned that they could more efficiently manage “by the sip” services. Some expected that blockchains could put all kinds of media into the direct control of its creators, solving the challenges associated with global licensing and royalty payments.

One CMO in Electronics from Indonesia observed that blockchain technology could support its efforts to monetize data itself, an asset it had as yet been unable to commercialize. A CHRO in Media and Entertainment from Germany declared that blockchain could even “boost economic development. It has the potential to enable entrepreneurs, even those in remote areas, to monetize their ideas.”

“Blockchain could kill e-commerce because it will be possible for any two people on the planet to trade with each other directly, without depending on an intermediary.”

“Blockchain,” a CEO in the Travel industry from the U.S. said, “leads our way to the sharing economy.” In the Insurance industry, a Hong Kong CEO noted, blockchain “could change the way the industry operates—rather than going straight to an insurer to get their vehicles covered, customers may now opt for a peer-to-peer style policy.” Independent fleet drivers whose driving records are tracked and analyzed on blockchains could opt to insure each other, for example.

Not all peer-to-peer platforms need to be between individuals. Blockchain, Explorers concurred, could also create value exchanges among businesses, such as shared infrastructure. Industrialists speculate that everything from factories to fleets could be widely shared, efficiently utilized and capitalized on blockchains. Hospitals are considering how expensive equipment, like a Magnetic Resonance Imaging (MRI) machine, could be shared to mutual advantage. Blockchains, an Explorer CHRO in Healthcare from the U.S. observed, could “democratize the sharing economy by making it cheaper to create and operate a platform.”

Chief Operating Officer,  
Consumer Products, Taiwan

## The power of peers on platforms

Sixty-six percent of Explorers are experimenting with a radically different business model—the platform model, which connects people, resources and organizations in an interactive ecosystem to create entirely new forms of value. Just 11 percent of the Passives are actively considering this new opportunity (see Figure 9).

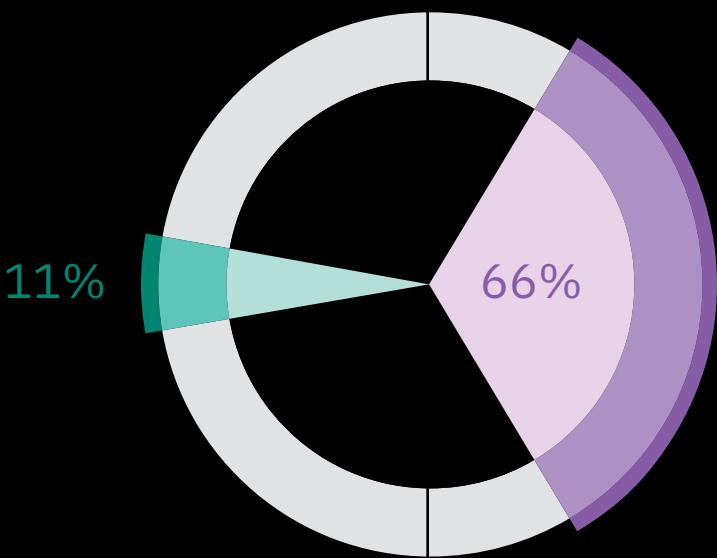
The difference between old and new business models has been described as the difference between pipes and platforms. Traditional business models are like pipes. Organizations collaborate to push goods or services out to customers. The value chain is linear. Business platforms are not linear. On platforms, producers and consumers in an ecosystem are connected to create new value. The founder, or owner of the platform, typically manages the platform in order to scale as quickly as possible and achieve network effects.

Figure 9

**Explorers**  
**Passives**

## Jumpstart

Explorers rush to new platform business models



**500% more**

Intend to adopt a platform business model

“With blockchain, we could connect across industries to provide a diversified platform to our customers, enabling them to buy different products.”

Chief Information Officer,  
Telecommunications, Brazil

Blockchains, strategist John Hagel recognizes, are particularly well-suited to leveraging the flow of data for those participating in platform-based ecosystems. Over time, access to shared data from blockchains enables platform participants to create new personalized services.<sup>5</sup>

Six of the leading banks in Canada came together to create a digital identity service that their customers can use to open accounts with other businesses, such as a cellular phone operator or a utility. The Know Your Customer (KYC) data that banks established to comply with regulations became the foundation for the customer's identity key. The banks worked with the governing authorities to allow others to use the identity key. They no longer have to repeat the KYC process if their new customer has been verified elsewhere. When customers use their digital identity at institutions outside the industry, the banks collect a fee.

The platform generates benefits for all parties: ease of use for individuals, a revenue stream for the participating banks, and a way to quickly verify the identity and history of new customers for other organizations on the platform. The service is currently in the testing phase in Canada, and once it goes live later in 2017, Canadian consumers will be able to opt-in to the new blockchain-based identity network using a mobile app.<sup>6</sup>

The Mahindra Group, one of the largest and most diversified multinationals in India, is working with IBM on a blockchain solution led by Mahindra's finance arm. The blockchain enables Mahindra to improve invoice discounting for suppliers that work with original equipment manufacturers (OEMs). The practice of bundling and selling unpaid bills or invoices at a discount is common in India, and a major source of working capital for suppliers. Historically, the process has been both slow and error-prone, which can delay payments and access to credit. On a shared ledger, timeliness and accuracy are greatly improved.

Mahindra's objective, over time, is to scale the number of participating OEMs and suppliers—and also include other financial institutions. Because smart contracts on a blockchain can ensure that competitive information is protected and masked, an open ecosystem platform for supply chain financing is now possible. Speaking of their blockchain efforts, Anish Shah, Group President of Strategy, Mahindra & Mahindra Ltd, says, "Our thought was, if there is something that can disrupt us, then we need to be in it."<sup>7</sup>

## Caution: Disruption ahead

Creating platform business models is not for the faint of heart. Six in ten Explorer CIOs admit they aren't yet good at building platforms that connect customers and partners across an ecosystem. For those on the business side of the house, the move to platforms might require some difficult choices—none more daunting than the prospect of disrupting an enterprise's own revenue streams. Explorer CEOs admit that in the past, they "blinked" when they faced the prospect of cannibalizing their business. Do they have the fortitude to follow through now?

**"Blockchain could replace the centralized business model that most companies follow today."**

Chief Marketing Officer,  
Retail, United Kingdom

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## Raise the tide: Shore up your partners and competitors

In robust ecosystems, new rules emerge. Because the whole is greater than the sum of its parts, each peer in a distributed ecosystem has the potential to either elevate or drag down the success of the network. Weak links in a rich ecosystem can be weeded out, but there will also be times when it makes more sense to support them so that they—and the whole—grow stronger.

On platform-based business models, strength begets strength. Organizations typically look for ways to leverage their competitors' strengths to their own advantage. For this reason, many organizations may choose to shift their mindset from locking out competitors to shoring them up.

Peers on blockchains start at the same level of security, transactional transparency, control and understanding of the underlying blockchain technology. Their interactions then determine the strength and success of the resulting blockchain network.

## Getting to open

The “rising tide” theory of economics is one of those concepts that sounds reasonable in the abstract—until you’re a CFO trying to convince a financial analyst that your organization has constructed moats that can’t be breached. Most organizations don’t look after the welfare of their business partners, let alone their competitors.

The Explorers report that they excel at creating compelling customer experiences and getting input from their customers to design their organizations’ processes. Significantly more Explorers than Passives describe their interactions with customers as stellar. They’re not quite as confident about their collaboration with partners, but do consider that they are better than average. Importantly, they recognize one area where they fall short. Just over one-half admit that they don’t yet have the right network of partners in place to achieve their vision.

To date, the Explorers’ experience with competitors is no different than any organization in our study. Eight in ten admit they aren’t accustomed to collaborating, even selectively, with their competitors. Lack of experience working with competitors is at present a handicap shared by all. The Explorers will be the first to be challenged to change, but this new capacity for co-opetition could also help them sustain advantage over others in the long run.

On blockchain, data can be shared and transactions can be transparent without compromising security. Permissioned blockchains enforce identity-based policies that can constrain both access to data and network participation. This enables participating organizations to comply with data protection regulations. Permissioned blockchains are also more effective at controlling the consistency of the data that gets appended to the blockchain, allowing for more granular decision processes to be built on top of them.

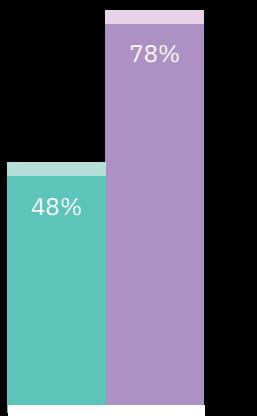
With permissions and trust, utilities can be built and used that fundamentally change business models.

As more organizations move to platform business models, the need for open collaboration will only intensify. Blockchains can support it. Algorithms and bots can automate it. But only live human beings ready to discard entrenched beliefs can make it happen.

Figure 10

## Explorers Passives

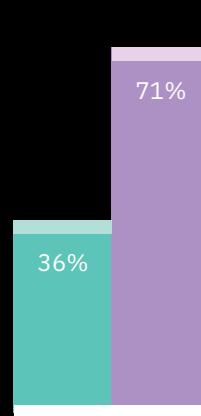
Customers  
are important



## Testing grounds

Explorers recognize the value of customers and consortia to advance blockchain efforts

Industry consortia  
are important



63% more

97% more

Explorers do recognize that something more than chance encounters with competitors will be required to advance blockchains across industries. Seven in ten Explorers selected industry consortia as important to their blockchain projects (see Figure 10). Industry consortia, of course, are the “safe zones” for competitor meet-ups. According to one estimate, more than 100 blockchain consortia exist today. Many are a testing ground to understand what’s possible, but their most important function may be to come to agreement on standards. Absent standards, blockchains could remain stalled at the gate.

“Since blockchain is based on a network approach, it’s important to have some minimum number of participants to offset the costs of setting up the infrastructure.”

Chief Operating Officer,  
Government, Australia

## Global trade routes

On platform business models, strategy shifts from controlling unique internal resources and erecting competitive barriers to orchestrating external resources and engaging vibrant communities. IBM together with Maersk, a global leader in transport and logistics, is already orchestrating such a community. Maersk will soon launch a blockchain platform that connects a supply chain ecosystem made up of shippers, freight forwarders, ocean carriers, ports and customs authorities.

In a trial in 2014, Maersk found that a single shipment of refrigerated goods from East Africa to Europe could go through nearly 30 people and organizations, and result in more than 200 different interactions and communications among them. Most of those communications have until recently remained paper-based due to concerns about authenticity and fraud.<sup>8</sup>

The costs associated with trade documentation processing and administration has been estimated to be up to one-fifth of the actual physical transportation costs.<sup>9</sup> Lost, misplaced or delayed paperwork can hold up shipments, undercut efforts to optimize transport and even result in spoilage of fresh goods.

“The projects we are doing with IBM aim at exploring a disruptive technology such as blockchain to solve real customer problems and create new innovative business models for the entire industry,” says Ibrahim Gokcen, Chief Digital Officer, Maersk. “We expect the solutions we are working on will not only reduce the cost of goods for consumers, but also make global trade more accessible to a much larger number of players from both emerging and developed countries.”<sup>10</sup>

Everledger, a new service built on a blockchain, has also adopted an ecosystem approach. Everledger can trace an individual diamond across the supply chain, from rough diamonds certified to be conflict-free to the same diamond as it's cut, polished and sold. Partners on Everledger's blockchain include insurers, law enforcement and diamond certification houses. Through Everledger's application programming interfaces (APIs), each partner can access and supply data that helps track a diamond over its lifetime. Police reports, insurance policy information and other sensitive information can be kept private and permissioned.

“I could see all the major players in the Auto industry using blockchain technology. It is publicly accessible but privately updatable so all the data of the owners — maintenance, insurance claims, etc. — could be stored.”

Chief Operating Officer,  
Automotive, Australia

The business model that CEO and founder of Everledger, Leanne Kemp envisions would allow all participants to reduce risk, but also to establish new revenue models and financial services. Banks could better finance the diamond supply chain; insurers could choose to cover the lifetime of a diamond, rather than its current owner. “We are not a disruptor,” says Kemp. “We are co-evolving the industry.” Everledger, she points out, demonstrates the “power of what happens when consortiums come together.” To date, more than a million diamonds are being traced on Everledger, and the system is soon to expand to fine wines.

As blockchain impacts new ways of working and networking, one constant remains. Whether you operate in a traditional market or a sharing exchange, adopt a linear value chain approach or participate in an ecosystem, trust provides the surest foundation for success. As one COO in the Retail industry from Australia said, “A customer’s trust is hard-earned and easily lost. The blockchain era should bring about an explosion of transactions, legitimized by trust.”

“Through digital transformation of the supply chain and trade finance lies one of the most exciting opportunities for smart contracts and blockchain.”

Chief Information Officer,  
Financial Services, United States

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# Charting a new direction: Three lessons learned from Explorers

## 1. Orchestrate economic advantage

New platform business models harness the interactions of ecosystems. Organizations should leverage the strengths of others. However, for the platform to thrive, all must share some level of economic advantage.

Organizations should start by identifying new opportunities to monetize data and alternative payment models. But, for those who play the founder role, keep in mind that you need to attract entities that produce and consume (and some will play both roles) to these multi-sided networks. Keeping them on the platform requires that all participants find ways to achieve advantage. If the producers find that instead, they're marginalized or commoditized, they're unlikely to stay.

## 2. Establish a circle of trust

Industry consortia are proliferating and are shaping agreement on business standards so that organizations can connect across regional boundaries.

To get started with implementations, however, many organizations look to “garage consortia” or smaller, trusted groups of industry partners that some call a “minimal viable ecosystem.”<sup>11</sup> Here, partners learn not only how to develop pilots, but often how to work together for mutual advantage. Over time, they can be proving grounds for more difficult kinds of collaboration—including how to act in concert with your competitors.

## 3. Learn fast and keep an open mind

For those who think there’s a wait-and-see advantage, think again. Early blockchain adopters are gaining muscle memory and experiences that can’t be quickly copied by those who hang back. Moreover, the first platforms being built may shape the evolution of blockchain for decades to come.

High levels of trust and transparency are a given. What’s not known is how organizations, individuals, partners and customers will respond as they gain access to data they’ve never had before. Will dynamic, just-in-time optimization quickly become the norm? Will smaller businesses join consortia to upset behemoths? Will the most successful enterprises leverage their blockchain expertise to jump from one industry to the next?

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## Our research methodology

We interviewed 2,965 C-suite executives from over 80 countries and 20 industries worldwide. Information was collected through a combination of live phone interviews and face-to-face meetings conducted from January to March 31, 2017. We performed a text analysis of participants' recorded comments using the IBM Watson Natural Language Classifier. This service deploys the cognitive power of Watson by classifying submitted sets of unstructured text responses to a training routine through which a group of themes or "classifiers" are developed.

This study draws input from:

Chief Executive Officers	504
Chief Financial Officers	475
Chief Human Resources Officers	468
Chief Information Officers	560
Chief Marketing Officers	478
Chief Operating Officers	480

## For more information

To learn more about this IBM Institute for Business Value study, please contact us at [iibv@us.ibm.com](mailto:iibv@us.ibm.com). Follow @IBMIBV on Twitter, and for a full catalog of our research or to subscribe to our monthly newsletter, visit: [ibm.com/iibv](http://ibm.com/iibv).

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## Notes and sources

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