Blockchain reinvents the consumer experience

Building better supply chains and customer relationships

IBM Institute for Business Value
survey conducted by
The Economist Intelligence Unit

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A new standard

Imagine if organizations could earn and keep consumer loyalty, not because they asked to be trusted, but because they could prove they delivered on promises. Quality, reliability, authenticity and product safety could be better assured. Supply chain partners could know for certain if an ordered item were on its way. An always-up-to-date performance history of a supply chain partner would be the basis for reputation. As each member in a retail network became instantaneously accountable, blockchain would make possible entirely new ways to create value.

Executive summary

The IBM Institute for Business Value surveyed executives from 203 organizations in the consumer industry – which includes both retail and consumer packaged goods (CPG) organizations – from 16 countries. We found that 7 percent expect to have a commercial blockchain solution at scale in 2018. Even more are working with and investing in blockchain now – a total of 18 percent.

These "First Movers" expect blockchains to take down the frictions that hold them back. Three-quarters of them have their eyes on new markets, while 69 percent expect to strip away information risks and 64 percent to better navigate the regulatory environment.

First Movers see broad benefits from blockchains across six areas: product safety and authenticity, supply chain optimization, finance, operational processes, promotional strategy management, and customer engagement and co-creation. In each case, they don't just expect targeted business benefits, such as time and cost savings or risk reduction, but the opportunity to create new business models or disrupt the industry. Ultimately, no matter where they start, they aim to expand new blockchain solutions to cover virtually every aspect of their value chains.

First Movers recognize that the opportunity introduced by blockchain covers both the supply side of their businesses and customer-facing interactions. They can use blockchain to dynamically reconfigure networks for real-time optimization or, in collaboration with other institutions, to gain deeper insights into their consumers. They can better assure the safety and quality of goods and also establish new markets, enabling them to transform the way they see and do business.

18 percent

of consumer industry executives surveyed – the First Movers – are working with and investing in blockchain today

7 in 10

consumer industry executives surveyed expect to have a blockchain production network in three years

6 in 10

consumer industry executives surveyed view insufficient skills as a barrier to blockchain adoption

Beyond loyalty: A new system for accountability

On a blockchain, data associated with each event or transaction is time-stamped, appended to the record before it and available to authorized participants in real time. Individuals can't tamper with records after the fact; records can be amended only by the agreement of all. In this way, data becomes part of an unbreakable chain of trust.

Blockchains quickly become singular sources of truth that can be shared across organizations. Organizations can instantaneously establish the accuracy of promises made between business partners and verify events as they occur. They no longer need to rely on intermediaries to facilitate trust.

Instead, because blockchains introduce transparency and consensus, network participants are fully accountable for their actions and contracts with each other and with their consumers. As accountability is locked into relationships, it becomes the basis for robust business networks – platforms that span the full value chain and may even include competitors.

A more pervasive system of accountability reconfigures who can participate in an ecosystem and what their roles might be. Smaller niche players and entrepreneurs can more easily join established networks. A sudden shortage caused by one supplier can more easily be fulfilled by another, for example. Networks that aren't locked into rigid hierarchies in the hopes of keeping out bad actors become more flexible and dynamic.

First moves together

Predictably, the percentage of consumer industry organizations – 7 percent – that expect to move to commercial blockchain production in 2018 is smaller than that of the first-wave industries IBM surveyed. Those first-wave industries – banking, financial markets, healthcare, electronics and government – on average counted 15 percent of their organizations as likely to implement commercial blockchains in 2017.[1]

The relatively slower path to production of consumer industry enterprises could reflect the lessons they learned from organizations that implemented blockchains in 2017. Many of those organizations found that establishing networks, governance processes and economic models was a complex endeavor that shouldn't be rushed.[2] However, the consumer industry expects to surge ahead of its first-wave counterparts in the future: 69 percent of respondents say they will have blockchains in production in three years compared to 66 percent in the first-wave industries (see Figure 1).

Figure 1

Ready to roll: Consumer industry adoption rate compared to first wave of industries (banking, financial markets, healthcare, government, electronics)

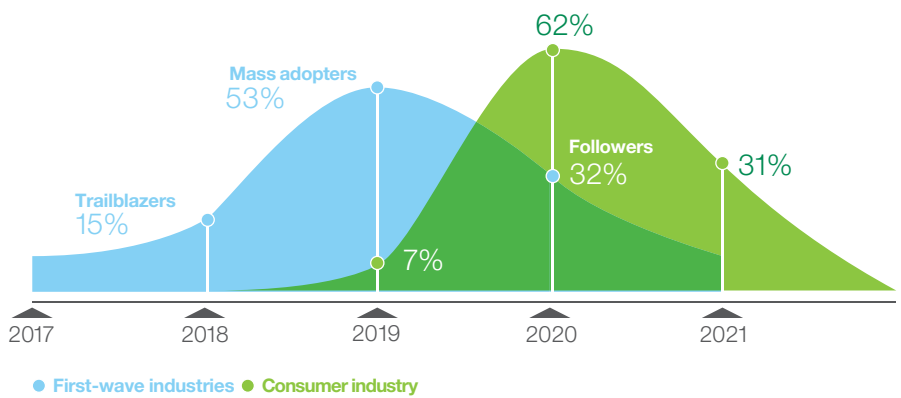
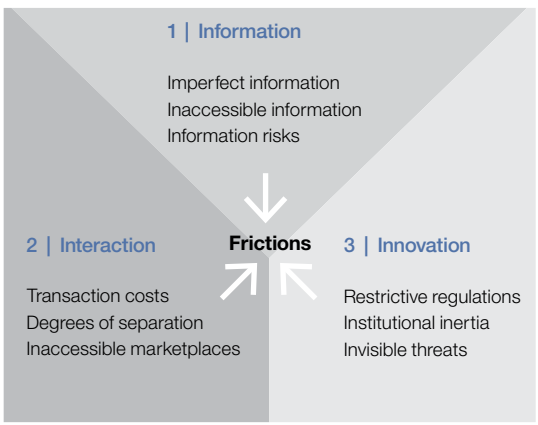


Figure 2

Frictions framework: Blockchains are expected to greatly reduce nine frictions



In the first-wave industry studies, we compared those organizations that were set to enter production by 2018, the "Trailblazers," with all others to better understand which business areas were likely to be blockchain-enabled first. For the consumer industry, we broadened our scope to those that are currently investing in or exploring blockchain, the First Movers.

Traditionally, First Mover organizations have borne the risks as well as the costs of investment in blockchain. Because most blockchain efforts are being taken up by business networks, investment and risk are shared across a group of organizations. The wait-and-see disadvantage is considerable: the collaboration inherent in blockchain networks is not quickly imitated by those who enter late. It requires significant alterations to an organization's culture, along with entirely new ways of working which involve business process changes, data sharing practices, and the like.

First Movers aren't just the first to understand what's newly possible; they also get to influence what happens next. They are able to shape the development of blockchain operations – how networks evolve as well as the conditions for success.

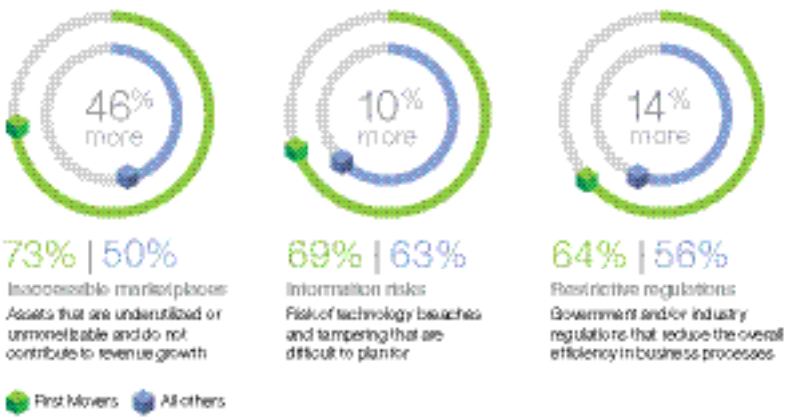
We compared the expectations of First Movers to those of other consumer organizations to better understand which business areas were likely to gain momentum first. In many instances, the interests, expectations and concerns of First Movers and all others were fairly closely aligned. They diverged significantly, however, in some fundamental ways.

In our first blockchain study, "Fast forward: Rethinking enterprises, ecosystems and economies with blockchains," we examined the potential for blockchains to eradicate the frictions that are a drag on organizations.[3] We identified nine frictions that challenge enterprises today and analyzed the impact blockchains might have (see Figure 2).

In the consumer industry survey, we asked for the views of consumer industry executives on these same frictions. The top three frictions where First Movers expect blockchains to have the greatest impact are: inaccessible marketplaces, information risks and restrictive regulations. The First Movers' focus on the capacity for blockchains to ease entry into once unattainable markets and to relieve restrictive regulations is significantly higher than that of their counterparts (see Figure 3).

Figure 3

Freefall: Top three frictions First Movers expect to diminish using blockchain



First Movers are determined to overcome the frictions that most directly curb innovation and growth. For CPG organizations, doing so can help boost the potential to market directly to consumers; for retail organizations, it can facilitate development of new online services and apps. In some areas, particularly food and product components, a complex web of processes and regulatory requirements can erode profitability and may even keep companies from participating in some markets.

Likewise, information risk – the mere possibility that personal data could be exposed – is a drag on innovation. Consumers aware of cyber risks may be reluctant to share personal data. Without that data, the personalization of product recommendations and shopping experiences is limited.

Suddenly visible: A new supply chain emerges

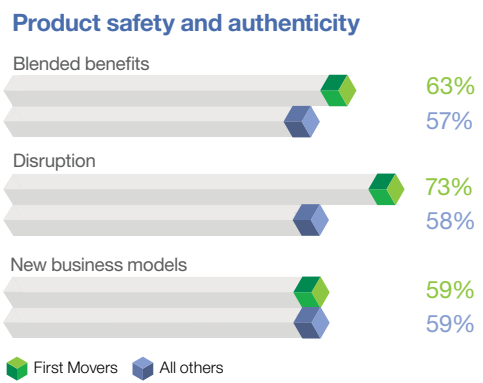
For this study, we asked respondents to consider the impact of blockchain on nine core business areas in the consumer industry. We defined impact along three dimensions: 1) blended business benefits, calculated as the average of time, cost and risk benefits, 2) the potential for disruption and 3) the introduction of new business models. Six of the nine business areas rose to one of the top three spots in at least one of the three dimensions (see Figure 4).

Figure 4

Broad benefit: First Movers assess blockchain impact across three dimensions

Figure 5

Provenance first: Product safety and authenticity prove popular



Some of the first blockchain solutions to reach production started at the point of origin – in a farm or fishery or diamond mine. Blockchains have been used to trace non-GMO wheat in fields, sushi-grade tuna in Indonesia and pork in China.[4] These blockchains prove provenance: they provide assurance that an item is genuine, safe to use or consume, or produced in accordance with any number of standards – from environmental impact to the use of labor.

Blockchains are particularly useful in preventing counterfeit goods from reaching the market. One sneaker manufacturer, Greats, is using blockchain and embedding smart tags in its footwear to thwart counterfeiting, a practice that costs the fashion industry USD 600 billion annually. With the swipe of a mobile app, consumers can scan the smart tag and verify the product is genuine. Retailers can track each sneaker back to the factory in which it was made.[5] Blockchain solutions like this are easily extended to other uses, such as tracking items at customs ports or providing early warnings of delivery delays.

Having proven their worth in early trials, three-quarters of First Movers expect that provenance-enabled product safety and authenticity solutions will positively disrupt their industry. As we saw in our earlier report, a cross-industry study of blockchain, "Forward Together: Three ways blockchain Explorers chart a new direction," disruption for those who apply blockchain is likely to be viewed as more headwind than tailwind.[6] It encourages organizations to act fast (see Figure 5).

In China, new regulations mandating better recordkeeping have been implemented to improve food safety. Walmart has responded by piloting a blockchain solution that traces pork from the farm to the factory and spans the supply chain, capturing data such as storage temperatures and expiration dates. More recently, the company tested blockchains on mangoes in Mexico, demonstrating it can track items like the day of harvest, the use of pesticides and a shipment's passage from importer to customs to processing plant. Investigations into foodborne outbreaks that once took weeks can now be done in a matter of seconds.[7]

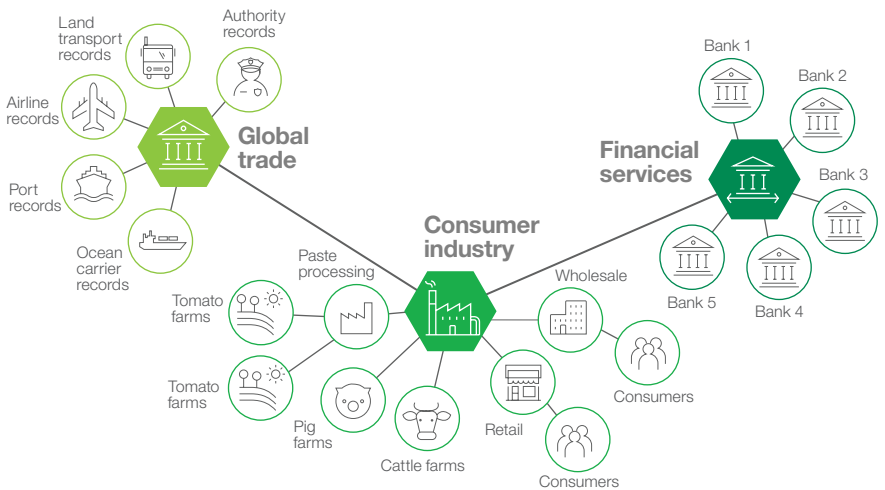
Retailers and CPGs, including Walmart, Dole, Driscoll's, Golden State Foods, Kroger, McCormick and Company, McLane Company, Nestlé, Tyson Foods and Unilever, will partner with IBM to test blockchains in a number of areas that support food traceability.[8] On a network that spans farms, processing plants, brokers and distributors, these organizations have a chance not just to detect foodborne illness, but to prevent it. As they collaborate to streamline data management on the supply chain, new applications and use cases could emerge.

Tracking the provenance of goods on the blockchain reduces risk and raises the bar on real-time quality management in production and distribution. Wastage, spoilage and defects are diminished; so too is fraud, theft and counterfeiting.

Once provenance-based blockchains are in place, organizations can extend visibility with solutions that audit regulatory compliance or manage later stages in the lifecycle of a product through warranties. The most significant and far-reaching business-model changes are possible as multiple blockchains begin to interoperate. These networks of networks could be the basis for an entirely new approach to supply chain transformation (see Figure 6).

Figure 6

Networks of networks: Exceptional value is realized when multiple blockchain networks interoperate

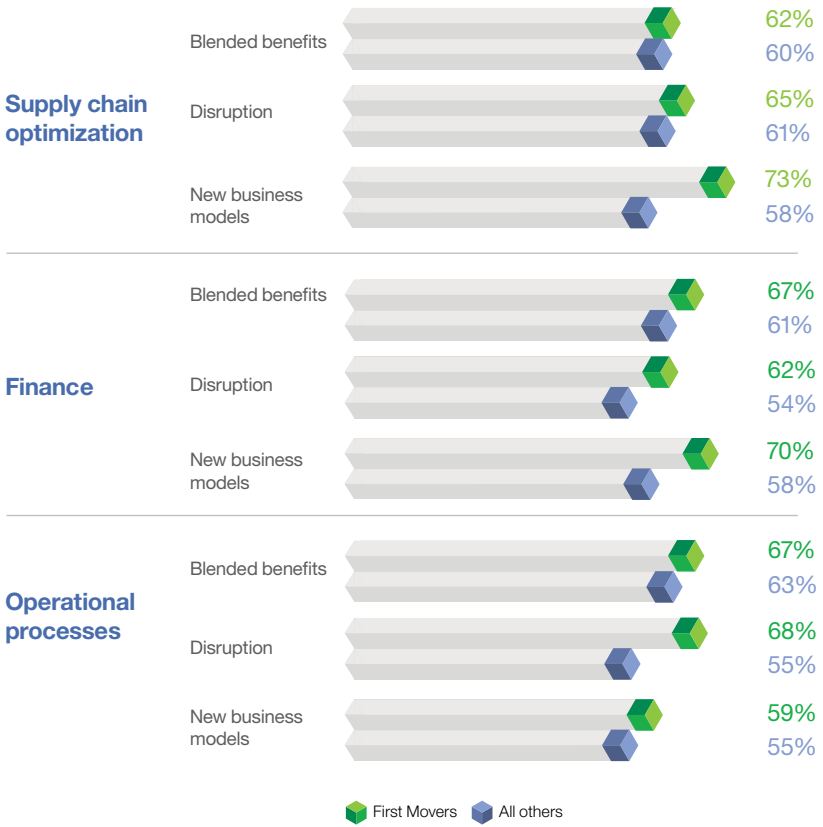


Optimization approaches real time

First Movers ranked supply chain optimization, which includes inventory visibility, the use of IoT sensor data, and shipment and order tracking, second in terms of new business models and third in its potential for disruption. Related activities in finance (including dispute management and credit approvals) and operational processes (including optimization and automation) ranked second and third in blended business benefits (see Figure 7).

Figure 7

All together now: First Movers and others expect supply chain optimization, finance and operational processes to benefit from blockchain



It has been estimated that lack of supply chain visibility costs organizations approximately USD 300 billion annually.[9] A decade of research on the digital transformation of the supply chain has demonstrated one fact: ambition has consistently outpaced progress. The modern supply chain remains replete with blind spots due to information that organizations either don't have or don't fully trust.

More than any other function, supply chains operate efficiently – or not – based on confidence in shared data. As blockchains make trusted data available in real time, they strip uncertainty out of each step of the process. Up and down the supply chain, sudden interruptions or bottlenecks – such as the shipment of a partial order, goods delayed at customs or parts that don't pass certifications and quality tests – can be detected.

One area for blockchain application is extremely promising: the "cold chain" or temperature-controlled supply chain. Here, raw goods and products that require special storage – items from cosmetics to food – can be distributed more safely.

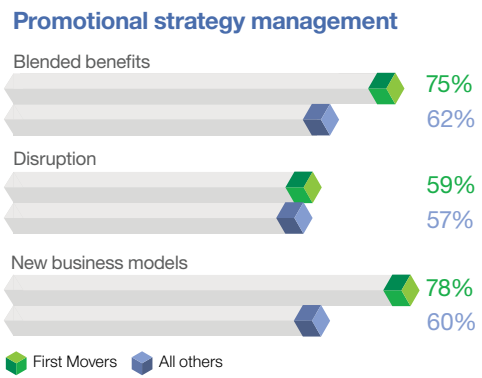
A blockchain operating the cold chain can double as an early warning system. It can trigger actions and automatic adjustments in response to unforeseen changes in any number of conditions. This includes changing "use by" dates, rerouting goods for express delivery, pulling goods from distribution and applying penalties.

In the future, a supply chain with continuous, instantaneous access to a chain of events could optimize its business network dynamically. For example, it could switch partners midstream if necessary and tap into a wider array of options for last-minute delivery. Organizations could reroute shipments on the fly and coordinate shared manufacturing facilities, equipment and infrastructure to optimize supply chain capacity. Blockchain traceability and transparency could make it easier to operate at a different scale, efficiently selling smaller lot sizes and working with smaller partners.

Much of the future opportunity of blockchain is linked to a wider use of IoT sensors to stream data that signals the location and conditions of raw materials and finished goods. On a truly decentralized IoT, devices could be configured to cooperate to match supply and demand, optimize production and distribution, and reduce latency to zero. As blockchains integrate IoT data, the next big industry disruption could be of a far greater order, yielding outsized efficiencies and more collaborative ways of working in a dynamic world.

Figure 8

Trade up: First Movers expect blockchains to transform promotional strategy management



Engagement by blockchain: Reinventing the consumer experience

As blockchains transform the supply chain, CPG and retail organizations gain new trust. For consumers, the authenticity and safety of goods can be verified. Organizations can more efficiently serve new markets, tapping into preferences for ethically sourced goods or buying local. CPGs and retailers can promote products and brands, earn loyalty and gain insights into consumer needs in entirely new ways.

First Mover organizations ranked trade promotional management first in both blended business benefits and new business models (see Figure 8). This is one area where visibility, confidence in the data and timeliness promise to significantly boost the bottom-line return. It is estimated that CPG companies spend over USD 500 billion per year on trade promotions, and that 85 percent of CPGs are highly dissatisfied with their capacity to manage this process. Forrester reports that about one-third of trade promotion spend yields a negative return on investment.[10]

Today, trade promotion remains a highly manual endeavor, dominated by a profusion of siloed spreadsheets that are often out of synch and prone to error. Approximately 25-40 percent of trade promotion contracts may be incorrect or out of date.[11] Promotional compliance typically varies store by store, making calculating the performance of each promotion at the SKU level incredibly complex. Proof-of-performance data is gathered manually from third-party point-of-sale data providers. Internal data, such as bill-of-lading and warehouse shipping details, must be manually requested from suppliers. Disputes and reconciliations are handled by email.

On a blockchain, smart contracts between suppliers and retailers can automatically reconcile settlement claims against contracts and proofs of performance. This could reduce human involvement in the settlement process. With better access to and confidence in performance data, including data in real time, CPG organizations could dramatically increase efficiencies – including optimizing inventory – and derive new insights. Retailers reluctant to share data in a timely fashion could face new pressures to collaborate more closely.

In an era of mobile apps and smart displays, shopper promotions have yet to be meaningfully transformed. As organizations optimize ROI for trade promotions, they can begin rethinking how those promotions are experienced in-store.

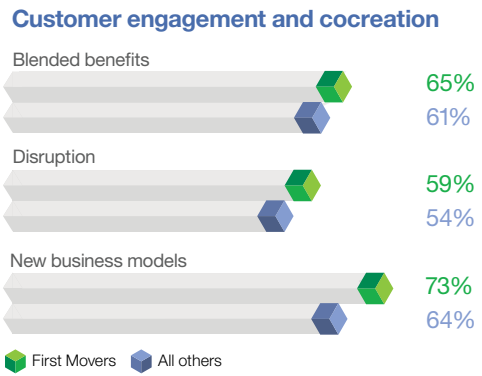
Buy-now promotional offers could be sent digitally to a consumer's phone as the consumer walks through the door or roams an aisle. Well-executed CPG direct-to-consumer promotions on a mobile app raise the possibility of reverse slotting fees. In-store and online promotions could be integrated with other brand and retail loyalty programs.

Three-quarters of First Movers expect blockchain to create significant opportunities to introduce new business models that transform customer engagement (see Figure 9). Many look to start with loyalty programs. Loyalty cards in their current incarnation reveal a narrow slice of a consumer's life. Grocers might know their consumers' brand preferences but little else. Collaborative loyalty programs, where multiple organizations share purchase data about individual consumers, could create a more well-rounded "market view" of the consumer.

Aeon Financial Service, a financial services entity of conglomerate retailer Aeon Group, that serves retailers and consumers in Asia, is testing blockchains to create loyalty programs based on digital currency, or tokens. Its expectation is that tokens that could be redeemed at retail institutions would be highly attractive to consumers and a boon to data collection.[12]

Figure 9

Demand driven: Blockchains take aim at customer engagement and co-creation



As data from promotions and loyalty programs is shared across institutions, context becomes richer, making possible new personalized products, services and experiences. Consumers with mobile devices in hand could walk the aisles retrieving information tailored to their individual preferences – data about the origin of an item, sustainability issues or health-related information.

Brooklyn-based startup Loomia is extending the possibilities for data collection and context to the textiles they manufacture. Sensors embedded into fabric could stream data to a blockchain to capture how consumers use products, like a cold weather jacket or boots, after purchase. Micropayments could be transmitted anytime the data is accessed or used.[13]

The traceability of items on blockchains coupled with new consumer payment methods could render check-out aisles – and long lines – obsolete. Outside of the store environment, personalized replenishment systems could foster new, more profitable revenue streams for CPGs and retailers alike.

Ultimately, blockchain could give new meaning to the consumer-driven marketplace. With blockchain-based identity management systems, consumers could determine who they share personal data with – and even demand a reward for such data.

Blockchains could create new markets by revealing to consumers the actual production cost of a sale item. Already, some are considering how “pay-per-use” applications of blockchain could transform the market for luxury goods. In theory, a consumer could purchase an item and after a period of time, efficiently transfer it back to the producer or a resale market, with each party capturing its share of the sale.

Recommendations

To extract the most value from blockchains, consumer industry executives should answer the following three questions:

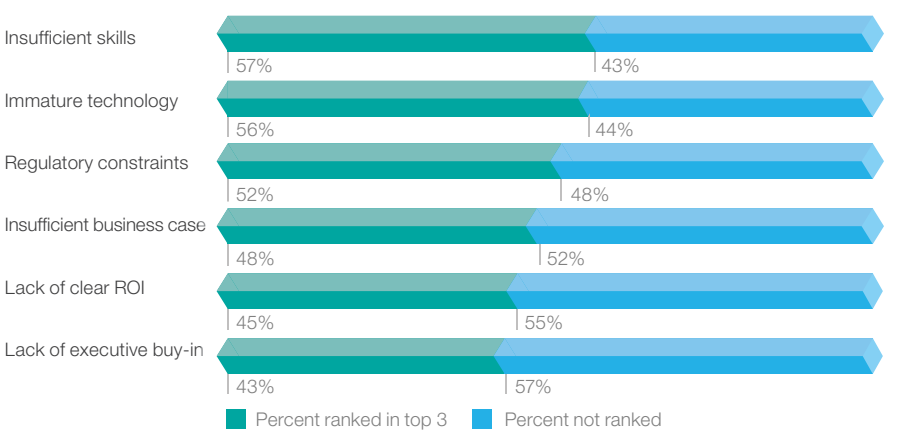
How fast should we move?

Eighteen percent of consumer industry organizations surveyed have already started. Almost 70 percent expect to have a production network in three years. Organizations not investing now in blockchain should prepare to join the industry in exploring blockchain use cases and potential network partnerships as soon as possible.

The demand for blockchain skills is fast outpacing supply.[14] Almost six in ten organizations surveyed view insufficient skills as a barrier to blockchain adoption (see Figure 10).

Figure 10

Blockchain barriers: Lack of skills outweighs executive buy-in



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Organizations investing in blockchain need more than additional software developers; successful blockchain commercialization requires skilled business and technical consultants, cybersecurity strategists, marketers and many others. To bridge the talent gap, consumer industry executives should explore cultivating the required skills through coding camps, community colleges, apprenticeships and other new-collar alternatives.

Can we achieve network-wide standards?

First Movers and the rest of the consumer industry are closely aligned on the barriers to blockchain adoption with one exception: just 8 percent of First Movers cite regulatory constraints as a significant obstacle to blockchain implementation. A full 24 percent of all others say they are stymied by regulatory constraints.

Blockchain, however, is viewed in many industries as a way to break through regulatory challenges. Today, regulators depend on visibility but achieve it only through spot inspections. However, blockchains can provide up-to-the-minute, trusted audit trails. Regulators have reason to welcome a technology that makes widespread accountability the new standard.

Can we scale with new revenue models?

Our survey shows that over half of the consumer industry executives surveyed have a clear ROI strategy and executive buy-in. Consumer industry organizations that have not achieved this clarity should make it a priority.

Consortia lay the groundwork for a better understanding of blockchain benefits, but many consumer industry organizations already recognize that strategic partnerships are necessary to create new business models across the value chain. However the retail blockchain networks evolve, the potential for new blockchain-enabled marketplaces and new forms of consumer engagement looms large. Consumer industry executives should factor this into their thinking from the outset.

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