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How Blockchain Can Help Retailers Fight Fraud, Boost Margins and Build Brands

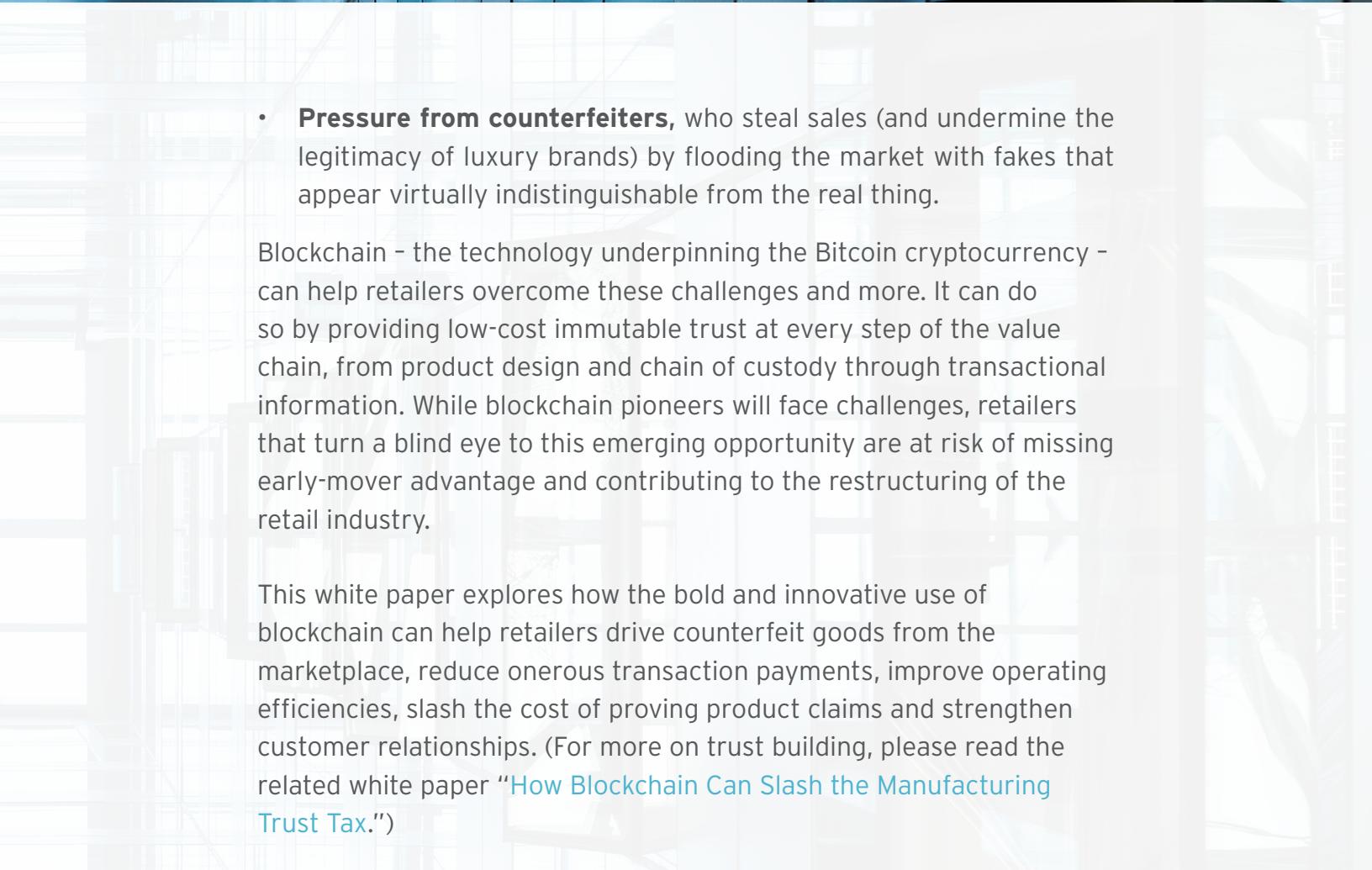
Using blockchain's distributed ledger, synchronized database and powerful encryption capabilities, along with its ability to generate smart contracts, retailers can gain early-mover advantage to more effectively collaborate and enhance trust across the value chain.

KEEP CHALLENGING™

Executive Summary

Retailers face a myriad of steep macroeconomic challenges, from global competition and the growth of online shopping, to margin pressure – and that's just the beginning. On a micro level, retailers contend with:

- **Limited supply visibility**, which causes order volatility and “the bullwhip effect.”¹
- **Empowered consumers**, who simultaneously demand both lower prices and higher quality.
- **Heightened demand for product authenticity**. Discerning customers increasingly want proof that their diamonds are conflict-free and their vegetables were grown on an organic farm, not just slapped with an organic label.
- **Higher costs from third-party payment processors**, many of which demand ever-higher transaction fees.

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- **Pressure from counterfeiters**, who steal sales (and undermine the legitimacy of luxury brands) by flooding the market with fakes that appear virtually indistinguishable from the real thing.

Blockchain – the technology underpinning the Bitcoin cryptocurrency – can help retailers overcome these challenges and more. It can do so by providing low-cost immutable trust at every step of the value chain, from product design and chain of custody through transactional information. While blockchain pioneers will face challenges, retailers that turn a blind eye to this emerging opportunity are at risk of missing early-mover advantage and contributing to the restructuring of the retail industry.

This white paper explores how the bold and innovative use of blockchain can help retailers drive counterfeit goods from the marketplace, reduce onerous transaction payments, improve operating efficiencies, slash the cost of proving product claims and strengthen customer relationships. (For more on trust building, please read the related white paper “[How Blockchain Can Slash the Manufacturing Trust Tax](#).”)

Blockchain Basics

Simply put, a blockchain is a distributed ledger secured by encryption that provides an immutable, trustworthy record of information without the need for verification by a centralized authority such as a bank or government. It does this by building a database of entries (each built from a preceding block of information and stored as a copy) that is secured by a complex mathematical algorithm. This approach makes it difficult for anyone to create fraudulent transactions or alter existing transactions.

Blockchains also enable organizations to employ “smart contracts” that automatically execute terms and take action to fulfill business obligations without intervention. (For more on smart contracts, see our white paper [“Blockchain’s Smart Contracts: Driving the Next Wave of Innovation Across Manufacturing Value Chains.”](#)) While the technical details are complex, the value for retailers is simple: Blockchain delivers trust (in a product, a transaction or the integrity of data) far more quickly and effectively than ever before.

Value Drivers for Blockchain in Retail

Here are four ways blockchain could remake the retail space, and the actions your organization must consider to gain crucial early-mover advantage. (While blockchain technology has been around since 2008, it remains in a nascent stage outside of cryptocurrencies. Today there are multiple variations, such as public, private and hybrid. What makes sense for one industry may not be practical for another.)

1 VALUE DRIVER: Provenance/Authenticity

Blockchain's initial impact will be focused on enabling retailers to provide more reliable information to customers, who - particularly for some product categories - increasingly base their purchase decisions on product content, origins, purity and authenticity. Currently, counterfeit or contaminated products exact a huge toll in the form of lost sales and brand damage, caused in part by the difficulty consumers have in differentiating fakes from the real thing. Consider the following roles blockchain can play in verifying product authenticity:

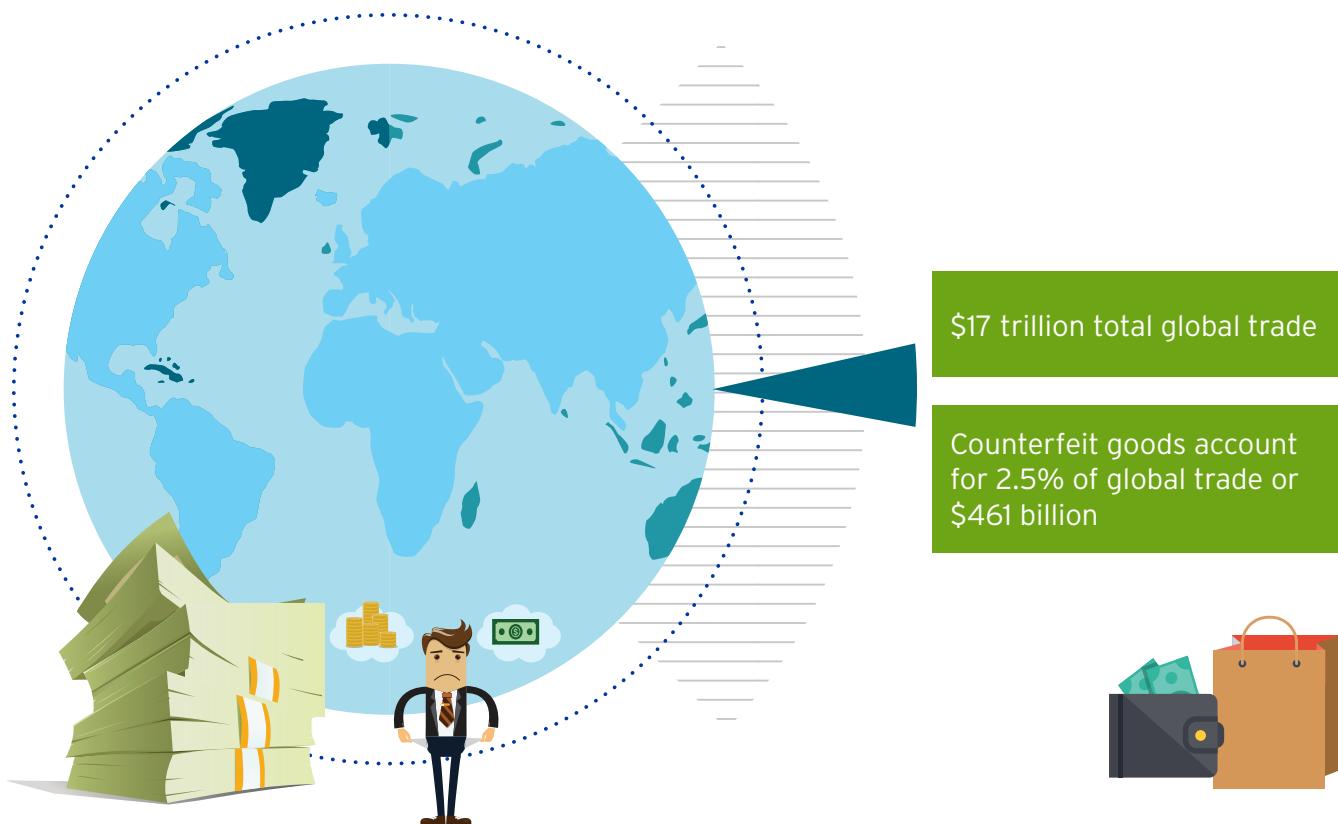
- **Fighting the scourge of counterfeiting.** The total value of imported counterfeit products is estimated to be as high as \$461 billion across the globe, annually (see Figure 1).² This translates into considerable lost sales for retailers. In just one recent example, the maker of UGG® footwear discovered more than 3,660 pairs of fake UGG products worth more than an estimated \$700,000. Since 2009, the company says, it has seized more than 2.2 million counterfeit products.³

Perhaps even more damaging is the erosion of brand trust, particularly with luxury products. As such, proving and continuously reinforcing product authenticity exacts significant recurring costs on retailers, manufacturers and law enforcement.

Recently, retailers have recognized the gravity of this issue. In fact, Amazon has begun taking counterfeit resellers to court.⁴ Using blockchain technology, retailers can provide customers with indisputable proof of the provenance and authenticity of their products at every step in the supply chain. One sneaker manufacturer, for example, is using blockchain and 3-D-printed smart tags, scannable by a smartphone, to prove product authenticity.⁵

- **Reinforcing the value of premium products.** Consumers are increasingly aware of and willing to pay a premium for organic, gluten-free food that has not been

The Cost of Counterfeiting



Source: OECD, European Union Intellectual Property Office
Figure 1

genetically modified. At the same time, they are losing faith that these labels mean anything beyond a higher price. A recent industry study showed that 40% of shoppers under the age of 49 believe organic is "purely a marketing term with no real value or definition."⁶

Blockchain can help change consumer attitudes toward these higher quality or specialized food sources by providing assured proof of product purity and origin, as well as the accuracy of ingredient listings. This will be accomplished by recording product information in a blockchain that persists throughout the entire food supply chain (i.e., from farm to fork). This data could include soil reports, sensor readouts and even animal DNA records.

Providing this information to customers will improve trust and increase product margins. The same benefits would apply to consumers looking for clothing, electronics or other products whose origins they care about, such as whether they were made in certified factories with proper safety protocols and humane treatment of employees.

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Blockchains & Smart Contracts

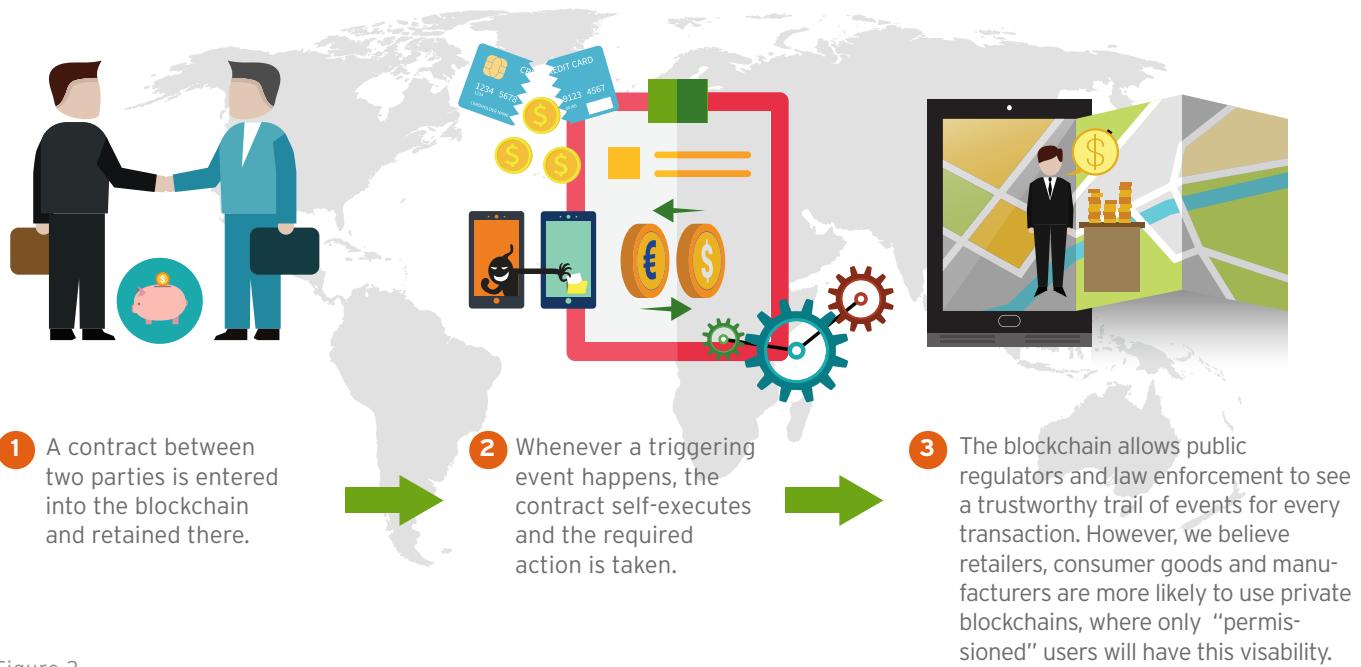


Figure 2

2 VALUE DRIVER: More Secure Transactions, Faster Settlement

A second promising application lies in transaction settlements. Today, every player in the retail value chain pays a steep price to ensure the validity of the exchange of goods, money and data. They must compensate third parties for their services and wait for each to finish its work before receiving payment or a transaction confirmation. Blockchain-based secure transactions can reduce the need for such third parties, resulting in the following benefits:

- **Reduced time and cost required to complete and ensure transaction integrity.** Using blockchain could, for example, speed the settlement process and/or reduce the fees retailers and other supply chain partners pay to banks and other third parties.
- **Reduced risk of fraud.** The use of blockchain could reduce the need for independent auditors and in-house accountants and lawyers to identify fraud and recover damages resulting from it.
- **More efficient business relationships through self-executing smart contracts** (see Figure 2). Here, blockchain could reduce the need for and cost of third parties such as brokers and purchasing agents by automatically finding the

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best price and terms for products and completing their purchase without human intervention.

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3

VALUE DRIVER:

Supply Chain Visibility

Blockchain can also dramatically improve visibility into complex retail supply chains, such as information on product status and location. Retailers and distributors today must reconcile information from multiple systems and use this data to optimize inventory levels.

In many supply chains, this lack of visibility causes over-ordering upstream, which results in the bullwhip effect: demand-supply variability that

can inflate costs considerably for upstream supply chain partners. The visibility provided by the ubiquitous information available on a blockchain can greatly reduce these costs. (For more on the bullwhip effect, read our white paper "[Reducing the Bullwhip Effect Via Market Research-Gleaned Insights](#)."

Blockchain-enabled user access control can ensure proprietary information is protected by restricting permission to view or modify data to the appropriate parties.

Suppliers, shippers and retailers can improve their forecasting and tracking capabilities by consolidating digital information into a single blockchain-based version of the truth. The combination of blockchain and smart contracts can reduce lag times, helping retailers meet demand more effectively while minimizing lost sales due to stock-outs.

Smart contracts provide a level of automation that enables unprecedented efficiency and cost reductions throughout the supply chain. Blockchain's improved data integrity and fraud resistance enables retailers to reduce headcount, streamline processes and take advantage of automation efficiencies.

For food-based value chains, a blockchain can expedite the process of recalls by providing the critical, immutable granularity needed to identify the issue and contain it. In this way, blockchain could save a food retailer millions of dollars by only recalling what is actually contaminated, preventing lawsuits, shortening investigations and maintaining accountability throughout the value chain. This will go a long way toward addressing the frequent food safety incidents in the industry. Applications like this can unlock unprecedented value for retailers, especially those with complex supply chains.

Blockchain-enabled user access control can ensure proprietary information is protected by restricting permission to view or modify data to the appropriate parties. The level of blockchain's granular control through permissions is similar to what is provided by legacy systems today but at a much lower cost.

Blockchain-based Collaboration Drives Supply Chain Visibility, Transparency & Trust

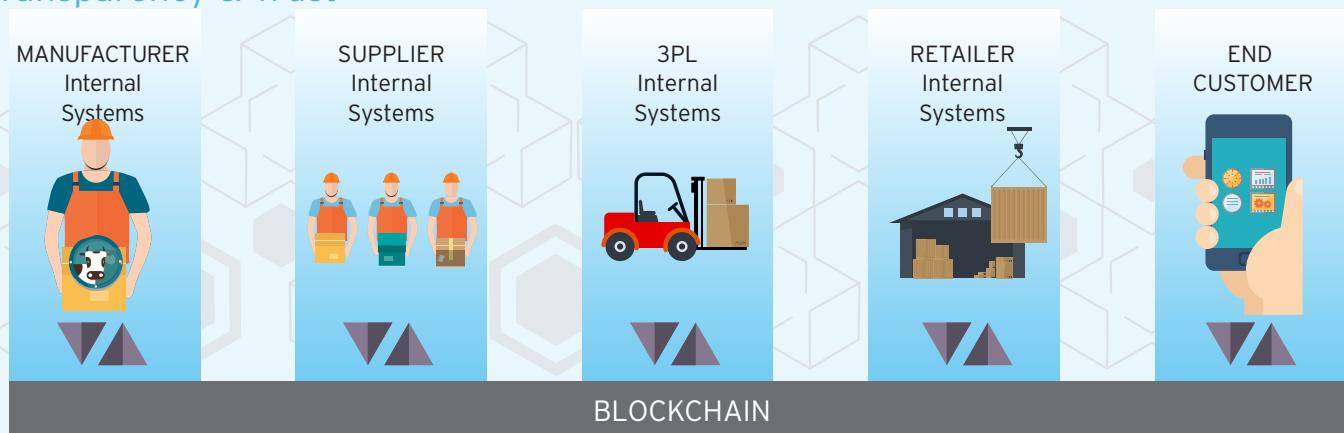


Figure 3

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VALUE DRIVER: Networked Loyalty Programs

Many companies are broadening their consumer loyalty programs to cover multiple brands.⁷ For instance, airlines offer passengers an opportunity to earn extra points for renting a car from a preferred vendor, or shoppers at a grocery chain get discounts on gasoline at affiliated stations. The easy use of points at a variety of merchants reduces the liability of the originating retailer (which according to a 2013 study amounts to nearly \$117 billion⁸). It also generates considerable incremental business for retail partners and increases consumer satisfaction with the loyalty program.

However, the outdated technology that tracks loyalty points imposes high costs and delays on participating merchants and consumers. Legacy mainframes can take days to process transactions, forcing customers to wait for points to post to their account. The use of blockchain can make tracking these points faster, cheaper, more secure and much more visible to both the owners of the points and the companies issuing them.⁹

Eventually, the impact of real-time data on consumer choices could enable the development of hyper-personalized and perhaps even customer-controlled loyalty programs in which consumers could easily buy and sell points to meet their ever-changing needs. This would further increase customer satisfaction and loyalty while strengthening relationships among merchants by giving them a common, real-time, in-depth view of their customers' joint purchasing activity.

The use of blockchain can make tracking points faster, cheaper, more secure and much more visible to both the owners of the points and the companies issuing them.

The Looming Challenges

As with any emerging technology, there are many visible and hidden obstacles that could thwart blockchain adoption. Many are typical of the challenges retailers face when adopting any new technology. These include excessive costs, organizational resistance to change and conflict management among business partners. Staying abreast of blockchain adoption challenges will help minimize the risks.

Initial blockchain implementation costs are driven by integration with existing legacy systems, such as ERP, CRM and supply chain management. Remember, however, that this effort will introduce unprecedented data visibility to the entire organization. The integration effort will be made easier as well-documented application program interfaces (APIs) emerge.

Convincing a risk-averse organization to adopt a novel technology like blockchain can be a difficult sell. Many established companies shy away from large software changes, especially those that involve important business processes such as supply

Quick Take

Early Proofs of Concept

As blockchain champions get comfortable with the technology's ways and means, we suggest they learn from numerous early-day trials. These include:

- **Everledger:** This UK-based startup uses "a permanent ledger for diamond certification and related transaction history ... (for) insurance companies, owners, claimants and law enforcement."¹⁰
- **Block Verify:** This company provides a "blockchain-based anti-counterfeit solution" for pharmaceuticals, luxury items, diamonds and electronics.¹¹
- **Provenance:** This UK-based company is using blockchain to "build trust with transparency and traceability" of information about products and materials.¹²

Agreeing on what information to share within an organization and with business partners is not a new challenge. Retailers have faced this tradeoff in transparency vs. customer confidence whenever they collaborate to reduce costs, deliver innovative solutions and better meet customer needs. Because secure, quick information-sharing is at the heart of the blockchain value proposition, it makes it even more important for retailers to open their minds and systems to effective and trusted collaboration.

Achieving such information-sharing also requires business partners to integrate blockchain with their legacy systems. Again, this is where proofs of concept are invaluable - putting the value of a blockchain on display in real-world conditions is an effective way to shed doubt. Using a proof of concept to demonstrate the value to business partners will help secure buy-in and accelerate the deployment timeline.

Blockchain's enterprise challenges are steep but not insurmountable. The value that it will deliver in a myriad of applications far outweighs the potential snags and necessary investment. Staying aware of the hurdles that stand between your organization and a full-blown blockchain will reduce mistakes and minimize risk.

Failing to explore and exploit an industry-shifting technology like blockchain could inflict penalties beyond missed operational efficiency and emerging ecosystem participation. Here, the laggard penalty may be harsh on those that fail to recognize the potential for blockchain solutions. (For more on digital adoption and the laggard penalty, see our white paper "[The Work Ahead: Mastering the Digital Economy](#)."

Quick Take

Blockchain Self-Assessment: Five Must-Ask Questions

Not sure where or how blockchain might help your business? Here are five questions to ask.

- 1 In what areas would assured, cost-efficient authenticity most increase sales or reduce costs?
- 2 How much could our organization benefit from improved visibility in our supply chain? What areas in particular would benefit the most?
- 3 How much would a tamper-proof digital transaction history drive value to our customers and our supply chain?

4 How much could substantial automation of business decisions drive value to our company? (For example, if transactions A and B happen, then transaction C automatically happens.)

5 How do we improve our current technological capabilities to take the earliest, and greatest, advantage of blockchain?



A blockchain champion would also be well-served by identifying the low-hanging fruit where the use of blockchain can provide easy wins.

chain management, loyalty management or payment systems. Here, a well-designed blockchain proof of concept can be deployed at minimal cost, and can function as a low-risk way to turn people into believers (see QuickTake, page 9).

To accelerate adoption, organizations need internal expertise well-versed in blockchain thinking and technology. A blockchain champion would also be well-served by identifying the low-hanging fruit where the use of blockchain can provide easy wins. Describing how improved technology and processes will further ensure blockchain's role in the future can also help build the support needed to drive proofs of concept.

Getting Started with Blockchain

At the dawn of digital commerce, too many retailers took a "wait-and-see" attitude. As a result, many found their business models gutted by online competitors before they realized the power of the Internet. Meanwhile, the first movers that understood the Internet's unique interactional and transactional capabilities acted quickly and blossomed into successful and powerful retailers.

Retailers face another such inflection point with blockchain. Its ability to deliver low-cost, secure sharing of information and value will drive game-changing benefits as discussed above. Early movers could gain the lion's share of the advantage by not only availing themselves of these benefits, but also mitigating blockchain limitations and identifying key building blocks for additional value creation.

To begin exploring blockchain's potential, retailers should take the following actions:

- **Match business pain points to blockchain capabilities.** Understand where blockchain can alleviate business shortcomings and deliver the greatest potential return on investment. Conduct a self-assessment (see Quick Take, above) to help match blockchain capabilities with your organization's greatest business challenges.

A new technology like blockchain needs a team of respected employees advocating for it, along with a successful proof of concept.

- **Identify a potential proof of concept.** A proof of concept is a powerful tool for shedding doubt about the value of blockchain. To achieve the most learning with the least risk, identify small-scale proofs of concept that are focused on areas where blockchain-based technologies are most mature and aligned with your critical business needs.
- **Find allies in your organization.** A new technology like blockchain needs a team of respected employees advocating for it, along with a successful proof of concept. Identify like-minded colleagues and build a coalition to help promote the proof of concept within your organization.
- **Establish a roadmap.** Once you have popular opinion on your side, encourage continued momentum by establishing a clear way forward for exploring blockchain's value for other areas of the business.

Throughout this process, blockchain champions should think big to understand the potential, start small to minimize the risk, fail fast to learn fast, and scale quickly when they find what works.

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Footnotes

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About Cognizant

Cognizant (NASDAQ: CTSH) is a leading provider of information technology, consulting, and business process services, dedicated to helping the world's leading companies build stronger businesses. Headquartered in Teaneck, New Jersey (U.S.), Cognizant combines a passion for client satisfaction, technology innovation, deep industry and business process expertise, and a global, collaborative workforce that embodies the future of work. With over 100 development and delivery centers worldwide and approximately 255,800 employees as of September 30, 2016, Cognizant is a member of the NASDAQ-100, the S&P 500, the Forbes Global 2000, and the Fortune 500 and is ranked among the top performing and fastest growing companies in the world. Visit us online at www.cognizant.com or follow us on Twitter: Cognizant.

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