

A Blockchain-Enabled Disruption Wave

Understanding this emerging technology and its impact on consumer brand manufacturers and owners.



There's an old adage that it's glamorous to say you're in law school, but nobody wants to admit they're a lawyer. As Bitcoin has slumped from heartthrob to depressed asset, it could similarly be said that everyone likes to talk about blockchain, but nobody wants to admit they're into cryptocurrency.

The reality, however, is that cryptocurrencies are enabling compelling business cases across several industries (regardless of what happens to the price of Bitcoin). And that blockchain is indeed starting to deliver on its outsized potential.

In this point-of-view, we will provide a brief summary of the technology behind blockchain and, more importantly, talk about how it's being used today with consumer brand manufacturers and owners, retailers and logistics organizations. We will also explore what organizations can do to both survive and flourish in the ledger-based environment of the future.

The resulting patchwork of integrations has been helpful for businesses that rely on IT complexity as a barrier to entry. But at a system-wide level, it drives up transaction costs and impedes innovation.

Additionally, each of the methods of data exchange listed above has two things in common: they introduce a meaningful amount of transactional friction and they rely on the sender / receiver to secure and validate the data.

Blockchain is revolutionary precisely because it turns both of these on their head.

Blockchain: The Opposite of Its Predecessors

Historically, ledgers (i.e., stores of organized data) were held by a single entity who controlled all entries. Blockchain takes the opposite approach, establishing an open ledger system where information is shared equally among the participants within the chain. In other words, ledgers go from being held by a single entity to being held by everyone.

Some of the guiding principles of blockchain include:

No Central Authority: Information is stored across a network of computers (nodes) making the chain decentralized and distributed or a "shared ledger". The information held within a given blockchain is contained in all locations providing redundancy. As a result, no one person owns the system, and there is no single point of failure.

Consensus Driven: Like the traditional general or financial ledger, past data is not permitted to be altered or changed. Instead, blocks are added to the end of the chain in chronological order. Each block is typically linked to the previous block through a hash pointer (for Proof of Work blockchains such as Bitcoin and Ethereum, although Ethereum is on the brink of transitioning to Proof of Stake). Consensus among the nodes (connections to the blockchain) is used to verify each new block within the chain. Transactions held within a blockchain are repeatedly checked against the various nodes. If a discrepancy is recorded against a verified block the entire blockchain is called into question. Disputes are resolved based on consensus of the information held by all of the participating entities. As a result, no one party has the power to alter the blockchain without gaining access to 51%+ of all nodes within the chain.

Trust Enabler: The distributed and consensus nature of blockchain ensures the integrity of that data eliminating the need to find a "trusted 3rd party" to facilitate and validate the transaction.



Blockchain is a decentralized ledger that uses distributed peer-to-peer consensus to verify and authenticate all information recorded within the ledger. All persons participating in the blockchain have access to the ledger to transact with each other which helps ensure security, transparency, and auditability of the underlying ledger information.

Introduction to Blockchain: A World Driven by Data

For centuries, the world was encumbered by the slow exchange of data: a letter in 1820 took 35 days to travel between England and India, a duration that could easily render the information in the letter obsolete before its arrival.

Communication speeds were increased later in the century via the telegraph and telephone. But it wasn't until the 1980s that mainstream methods of moving large amounts of structured data gained meaningful traction in the form of the fax machine, EDI, XML and email. These mediums were quickly joined by more sophisticated techniques such as SOAP and REST web services.

Before we knew it, our quest for ever improved data exchange had yielded an amalgamation of fragmented technologies and protocols to govern the flow of information between enterprises.

Blockchains can be implemented in three different ways that determine (A) who can view the information held within the network and (B) who can participate in the network.

1. Public

Public blockchains are open to all and all information held within the chain can be viewed by the public. Participation in the blockchain is encouraged and relatively painless for individuals to join. No specific permissions must be granted. Bitcoin is the largest public blockchain.

2. Private

Private blockchains are open to only those invited to participate in that specific blockchain. Invitations are validated either by the network starter or by a set of predefined rules held within the network (digital identification). Information held within the chain can only be viewed by those individuals. Private blockchains are gaining momentum with most supply chain proof of concepts built on private blockchains. However, these types of networks limit full scale adoption by all potential participants within a required supply chain network.

3. Hybrid

Hybrid blockchains combine the features of both public and private blockchains. Underlying a hybrid blockchain is a public blockchain which allows public view of information held within the network (or sub-components of information). However, participation and in some cases full view of all information held within the network is limited to those users with permission. Hybrid blockchains provide control over what information is kept private and what information is open to the public. This should be considered when consumer interaction with the network is required, such as sharing raw materials sourcing information.

The last important concept to understand within blockchain is the concept of tokens and why some blockchains have an intrinsic token and others do not.



Token Blockchain:

An intrinsic token (also called native or built-in) in blockchain is a digital resource that is generated and controlled by the blockchain. The token establishes the underlying cryptocurrency. You never possess the token, only the key that lets you access, create new ledger entries, and potentially re-assign the token to someone else. Tokens are usually part of an incentive scheme to encourage people to help validate nodes and create blocks. In some cases, their purpose is to create a small cost per transaction to prevent spam activity.



Tokenless Blockchain:

Private blockchains tend to be tokenless. An incentive for participation is not established nor required. The parties participate for other reasons such as contractual obligations, trading partnership agreements and so on. A tokenless blockchain does not imply no value is associated with the blockchain. Assets still may be traded including goods, merchandise and an exchange of funds. However, these assets exist outside the blockchain and their ownership, value and transfer is recorded within the ledger.



Public



Private



Hybrid



Cross Industry Benefits of Blockchain

The promise of blockchain is large and surrounded by much hype. However, if successfully deployed, there are benefits that could apply to all industries. The following is a brief discussion on just a few of those benefits.



Data Visibility and Reconciliation

As mentioned above, blockchain turns the traditional model of data stored by single entities on its head. To do this, it places the data in what's called a "shared ledger", which in simple terms means every participant gets a copy of the data (i.e. the blockchain).

To manage this democratization of data, two functions are necessary:

Synchronization: Data is simultaneously and securely shared as nodes within the blockchain to verify and "memorialize" transactions (i.e., everyone's copy is kept up to date)

Validation: New nodes are only added when consensus on the validity of the information (transaction) is verified by the majority of the participants. In other words, when a new node fails to follow the necessary protocols of the blockchain, it is rejected. Through this function, disparate systems with incomplete, conflicting or unreliable information is eliminated for all participants.



Traceability

As we'll further explore, traceability is one of the big wins for blockchain. Blockchain enables organizations to track products from raw material sourcing through production to delivery and post-sale support, making it possible for every touch to be recorded and for verifiable records to be attached and stored allowing the item's pedigree to be securely recorded.



Dispute Resolution

Even the most productive and collaborative business relationships experience disputes. Settling disputes can be costly and time consuming. Blockchain, through its ability to provide distributed delivery records and consensus driven transaction verification, can not only simplify the dispute resolution process but identify misalignment of information in real-time during the verification process. In theory, this could move beyond the simplification of the dispute resolution process and eliminate the occurrence of disputes in the first place.

How Blockchain Applies to CPG, Retail and Logistics

As mentioned in the introduction, blockchain has reached its early adolescence phase, moving beyond wonky computer science departments and gaining early, meaningful traction. This dynamic is being powered not only by start-ups, but also by global corporations and institutions.

Blockchain's early disruption of traditional industry value chains has been particularly salient in the consumer packaged goods, retail and logistics industries. In Infosys Consulting's recent work with a number of companies, we have encountered blockchain solutions affecting the full end-to-end value chain, impacting the way goods are sourced, chosen by customers, secured, paid for, shipped and even rewarded.

Below we explore several of the concepts gaining meaningful traction and analyze what your organization can do to ensure you're prepared to thrive in this dynamic environment.

Tracing How Goods Are Made

Supply chains are global and growing ever more complex. Raw materials and products are transported across multiple geographies before they reach the hands of the consumer. While at the same time, governments and consumers are demanding greater visibility into the source of the materials used to manufacture a product. Certification that materials have been Fairtrade Sourced, Ethically Sourced, or Conflict-Free along with Organic and Non-GMO are all now highly sought by consumer brand owners. Failure to provide such information can lead to penalties as well as lost consumer confidence.

50 years ago, brands would make broad claims about quality or origin, put it on their label, and move on. As time has passed, however, more stringent industry standards have been introduced, such as 'certified organic' or 'non-GMO'. And today's consumers – a group that's been trained to read labels and in search of rogue inputs – are showing a desire to make buying decisions on the end-to-end journey of goods from field to shelf.

To enable this, data needs to be both captured and aggregated.

1) Data capture: all industries have realized, in their own way, there are compelling advantages to software-driven analysis of data. This has led to the proliferation of data-capturing sensors on everything from John Deere tractors that track field-level data on crops to machine-level fingerprinting of manufactured goods as they move through the production floor and, more broadly, through the supply chain.

2) Data aggregation: prior to blockchain, the data captured from field to shelf was trapped inside disparate enterprise systems, making it incredibly difficult to string together in an actionable way. Today, however, several companies are recording blockchain-powered, end-to-end product journeys that are forming the basis for overall brand messaging.

One company using blockchain to enable this granular research is UK-based startup [Provenance](#). Guided by the tag-line “Every product has a story”, Provenance works with food manufacturers to track and trace every step of the supply chain, enabling companies to track the journey products take from field, slaughterhouse and boat / sea to the package.

To instill trust and minimize friction, the Provenance data set is built on blockchain technology that includes a traceability system to confirm identities and product attributes in tracking items through supply chains.

with unique identifiers so that they can be tracked and validated. Blockchain could provide full visibility into “first mile” and “last mile” of the product lifecycle.

An example of this is [BLOCKVERIFY](#), a blockchain start-up with a focus on the pharmaceuticals, luxury items, diamonds and electronics markets that has developed a suite of technologies designed to effectively address these technology hurdles.

Leveraging blockchain's ability to seamlessly and securely store and distribute data, BLOCKVERIFY uniquely labels products, verifying supply, consumers and retail locations. This allows the firm to identify situations where counterfeit products enter the value chain at any step of the process.



Paying for Goods

Once products have been successfully vetted and a shopper decides to make a purchase, a financial transaction needs to take place. Such payments have traditionally involved credit cards, but this approach has two important weaknesses:

- Transaction fees for credit card purchases – typically in the 2% range – are rather high, drawing ire from retailers.
- Not all addressable shoppers have credit cards.

Blockchain-based cryptocurrencies counteract these challenges by offering lower transaction fees (sometimes closer to ~0.25% instead of 2%) and removing the requirement for individuals to possess credit cards. These advancements both expand the universe of buyers and reduce the financial cost (i.e. friction) for doing so.

Helping drive adoption in the market are companies such as [BitPay](#), a start-up that offers a Bitcoin payment integration to Point-of-Sale Systems, enabling retailers to directly accept cryptocurrency as payment. Retailers are implementing these solutions, supplying their POS platforms with cryptocurrency integrations. Examples include Reeds Jewelers, an American fine jeweler with a large brick-and-mortar presence, and Burger King in Russia.

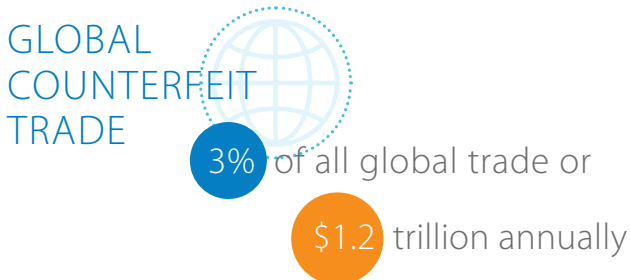
For shoppers who do have a Visa card, [TenX](#), a startup based in Singapore, has developed a way to connect a Visa wallet to digital currencies, allowing customers to spend their cryptocurrencies (Bitcoin, Ethereum and Litecoin) anytime, anywhere, vastly streamlining adoption.

A light blue rectangular box with a white double arrow pointing right on the left side. Inside the box is a quote in blue text.

“We envision a future where every physical product has a digital history, allowing you to trace and verify its origins, attributes and ownership.”

Ensuring the Authenticity of Goods

According to the 2018 Global Brand Counterfeiting Report, the global counterfeit trade is estimated at roughly \$1.2 trillion annually or 3% of all global trade. International trade organizations also agree that the problem of counterfeit products is growing rapidly with some estimating recent year-over-year growth in counterfeit products is in excess of 80% annually. Counterfeiting now impacts almost all product categories across all product price points. As a brand owner, this poses significant risk including consumer product safety concerns.



Blockchain offers a solution by enabling product authentication at the unit level. Blockchain allows individual items to be tagged

Streamlining Cross-Border Traction

Blockchain is also playing an expanded role in global commerce. Twenty-eight banks from around the world – including heavyweights such as Deutsche Bank, JPMorgan Chase and Société Générale – are currently participating in a proof of concept to “validate whether blockchain can help banks reconcile their international nostro accounts in real time”.



“The potential business benefits ensuing from the PoC are clear. If banks could manage their nostro account liquidity in real time, it would allow them to accurately gauge how much money is required in each account at any given point, ultimately enabling them to free up significant funds for other investments.”

Damien Vanderveken,
Head of R&D, SWIFTLab and UX at SWIFT

Shipping Purchased Goods

As goods move through the supply chain, either from manufacturer to retailer or from retailer to end-customer, they rely on logistics operators to transport goods between parties.

In addition to leveraging sophisticated enterprise software platforms to efficiently route and track shipments, hand-offs of goods between parties need to be recorded in the form of Bills of Lading. This process has historically been done with a combination of written forms and disparate IT systems, introducing a tax on participating companies and impeding the sharing of data for things like point-in-time tracking and fraud prevention.

[Wave](#), a startup still in testing mode, has hopes to modernize the import Bills of Lading with blockchain.

“Wave has created a peer-to-peer and completely decentralized network that connects all carriers, banks, forwarders, traders and other parties of the international trading supply chain. Using decentralized technologies, all communication between these parties will be direct and will not pass through a specific central entity. Due to its decentralized nature, the Wave network will not have any single point of failure and will not rely on any single entity.”



Connecting all members of a supply chain to the decentralized blockchain allows for a direct exchange of documents between them, solving one of the shipping industry’s largest problems.

In addition to enabling a smoother exchange of goods, blockchain can additionally help logistics businesses manage their service providers. These service contracts are often loaded with various performance objectives and service-level agreements that tie back to compensation. Poor visibility into the core data needed to effectively measure performance along with siloed systems between parties has traditionally been a problem resulting in both parties coming to the table with different answers.

Blockchain provides transparency into the data needed to effectively and objectively measure performance such as on-time delivery. Further, the system forces collaboration in order to create the chain, this allows each party to hold the other mutually accountable. In addition, it can provide insights into reoccurring delays and enable better collaboration between parties.

Rewarding Customers for Purchases

After goods have been purchased and successfully delivered, retailers often want to reward shoppers with promotions such as warranties and loyalty points.

Approximately 75% of US adults participate in one or more loyalty programs with more than \$50 billion worth of perceived value issued annually through these programs. But historically, more loyalty programs fail than succeed.



This can largely be attributed to scale: shoppers’ points are spread across several programs and accruing enough points to translate them into something valuable rarely happens. Compounding this challenge, each program has its own rules and management system, something that imposes an important tax on consumers. The result is that most programs struggle with user adoption and high breakage. Rakuten, Japan’s largest retailer, has leveraged blockchain to develop an elegant, simple, effective solution.

The company has developed a program that awards loyalty points in the form of Rakuten Coin, an alt-coin built on blockchain technology. In a recent article, [CoinDesk](#) reported that Rakuten has migrated an impressive \$9b USD worth of existing

“Super Points” onto the Rakuten Coin blockchain. These Rakuten Coins can then be spent on Rakuten or converted to other forms of crypto-currency using publicly accessible exchanges.

This is incredibly meaningful as it directly addresses the challenge of points getting “stuck” in one retailer’s program, therefore depressing the perceived value of the reward. This new level of liquidity provides a massive incentive for shoppers to continue bringing their business to Rakuten.

Managing Warranties

Retailers are not the only ones who want to continue to engage with consumers post sale. Consumer brand manufacturers have a high interest in long-term engagement through warranty and product support. The challenges with warranties, however, are very similar to loyalty points: they’re hard to keep track of and not easy to redeem.

Taking a similar approach to Rakuten, startup [Warranteer](#) has built a blockchain ledger designed to enable shoppers to easily load and digitally manage all of their warranties. Shoppers simply download their app, load basic product / warranty information at time of purchase and the blockchain does the heavy lifting of securely keeping track of the information.



Simplicity Often Wins

The attribute that most of these blockchain-based concepts have in common is simplicity. Because they circumvent organization’s byzantine IT systems and securely provide data to the businesses and individuals who need it, they make it simple to apply technology solutions to real-world problems. And if there’s anything history has taught us about technology, it’s that simple often wins.

How to Get Started

Given the uncertainty in the future technological landscape for blockchain, we recommend exploring and experimenting with various platforms both public and private. Early adopters will be given the power to set standards and drive the blockchain ecosystem. Therefore, we do not recommend sitting on the sidelines.

At Infosys Consulting, we have a core team of supply chain talent focused on blockchain strategy and enablement. Through numerous client engagements and the building of some of the first live blockchain networks, we have developed the following approach to launch a successful blockchain program.

An Approach to Blockchain

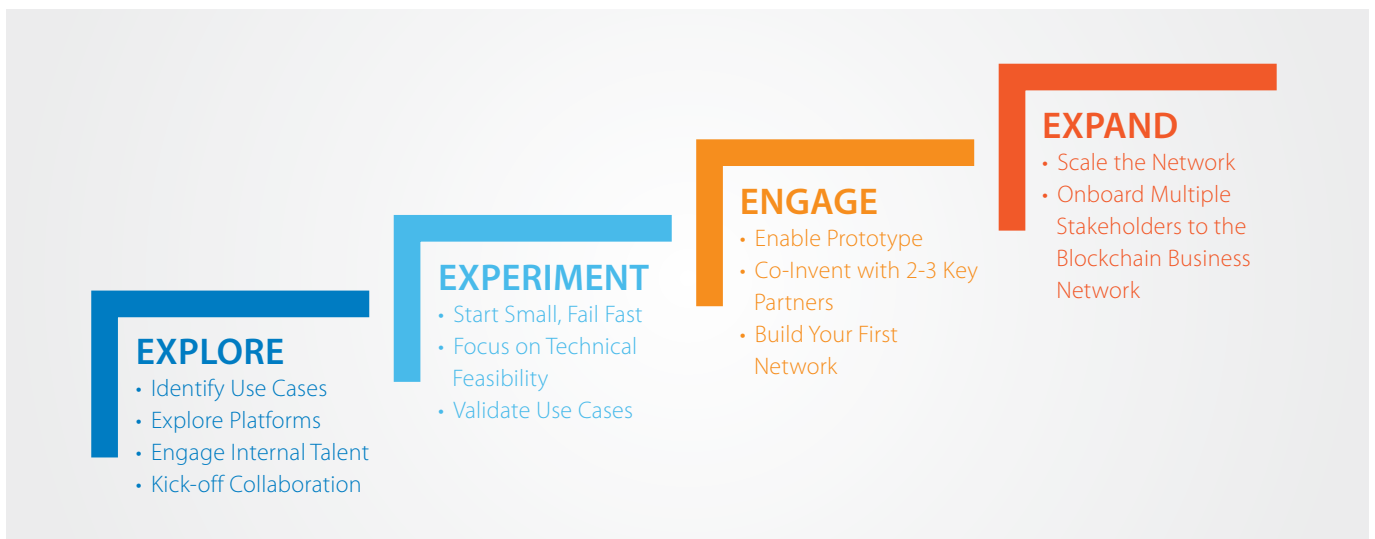


Figure 1: Infosys Blockchain Approach

About the Experts



Dan Albright – Partner, Leadership Team Member, & Digital Supply Chain Management Practice Head (U.S.)

Dan has 25 years of management consulting experience across the retail, CPG and distribution industries. He currently manages the supply chain group for Infosys Consulting in the U.S., overseeing some of our top clients such as XPO Logistics, TKE, Sprint and Microsoft. He is also a member of the U.S. leadership team and leads a number of corporate initiatives to support our firm's growth strategy. Dan has worked across all components of business and technical transformations during his career. Prior to joining Infosys Consulting, he led the consumer packaged goods, retail, and distribution service practice at Capgemini Consulting. Dan resides with his family in Atlanta, Georgia.



Sylvie Thompson – Associate Partner, Supply Chain Management (U.S.)

Sylvie is a passionate and results-oriented supply chain leader. Her experience with supply chain start-ups has demonstrated to her that supply chain professionals must question the status quo in order to deliver next-generation solutions. She is a believer in hands-on experimentation in order to deliver maximum results. Sylvie has developed and implemented numerous supply chain transformation initiatives for her clients and has extensive experience working with leading retailers and consumer brand owners.

About Infosys Consulting

Infosys Consulting is a global management consulting firm helping some of the world's most recognizable brands transform and innovate. Our consultants are industry experts that lead complex change agendas driven by disruptive technology. With offices in 20 countries and backed by the power of the global Infosys brand, our teams help the C-suite navigate today's digital landscape to win market share and create shareholder value for lasting competitive advantage. To see our ideas in action, or to join a new type of consulting firm, visit us at www.InfosysConsultingInsights.com.

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