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# Blockchain

Inspiring an evolution in commerce

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# Introduction

**Blockchain is changing the face of business today.** It is pushing the boundaries of what is possible, allowing dynamics between businesses and consumers that were previously unimaginable because of the immutability of shared data transacted broadly across an ecosystem of multiple parties. Right now, someone, somewhere, is creating a blockchain solution to drive innovation and disruption of traditional business models. This is occurring in virtually every industry and in most jurisdictions globally. Indeed, we are now witnessing an evolution in commerce.

Last year, Deloitte conducted its 2018 Global Blockchain Survey, which focused on blockchain adoption among enterprise organizations looking to transform legacy-constrained business solutions to remain—or become—more competitive in global markets. More than 41 percent of respondents said they expected their organizations to bring blockchain into production within the next year. Our 2019 Survey cast a wider net to capture the opinions of "emerging disruptors," the new entrants who build their businesses around blockchain from the start. Our findings suggest that these entrepreneurial innovators play a critical role in shaping the larger blockchain ecosystem.

According to our 2019 survey, 45 percent of emerging disruptors have already brought blockchain to production, while slightly less than one quarter of enterprise respondents say they have. In a similar regard, 90 percent of emerging disruptors are actively hiring blockchain talent, in contrast to less than half of enterprise respondents. What these and other data points from our survey suggest is that the focused energy of emerging disruptors is a key factor driving innovation within the blockchain community.

In the blockchain ecosystem, there are new characteristics of innovators and founders. Deloitte sees an increasing number of entrepreneurs, frequently paired up with industry veterans, starting new organizations with bold ideas who leverage their experience to execute. These "emerging disruptors" are approaching blockchain differently than their legacy competitors. Emerging disruptors are not thinking incrementally about change, rather they are fundamentally changing how business is being conducted across industry sectors around the world.

# Commerce is evolving

## Everything evolves to fit a constantly changing environment.

**In nature, plants and animals that can't adapt eventually wither away and become extinct.** The same is true in business, where companies that can't adapt get pushed aside in favor of new organizations with fresh ideas, approaches, and solutions. The companies that adapt and thrive are known as emerging disruptors. These companies are drivers of change when it comes to the adoption—and advocacy—of disruptive technologies, such as blockchain. As expected, many of these organizations are startups, but possess the potential for rapid growth. Others that are further along the curve in evolving their concepts have already recorded demonstrable results disrupting the legacy companies in their markets.

In either case, these organizations and the executives behind them share similar traits: the ability to recognize, and then ignore, the longstanding norms of legacy business models. While legacy enterprise organizations, by their very nature, may be slow to change, emerging disruptors are fast, agile, and willing to fail fast to devise and implement game-changing business solutions.

Often well-funded and managed by seasoned executives, well connected to key stakeholders, and well versed in the potential value offered by commerce re-imagined by blockchain, many of these organizations operate with few boundaries and possess a vision without gravity, unconstrained by legacy challenges, with a realistic view of a different future.

In comparison, many legacy organizations approach blockchain from the opposing direction, trying to redefine legacy business models by implementing new technology into their existing operations. While these organizations look at operational efficiencies or some revenue generating use cases, many fail to grasp the fundamental tenets of blockchain's potential. Blockchain-enabled business model change is a seismic shift in how business will be conducted in the future—especially given that the global economy is becoming more digital, and the decentralization of business models and stakeholders allowed by blockchain allows for a new dimension of innovation.

# Driving change with blockchain

**On the surface, blockchain technology seems rudimentary since it shares similar attributes to familiar things like databases.** However, blockchain can simplify how organizations transact broadly with one another, and retain privacy and security for their data. Blockchain may change the way in which users interact with data, enabling transactions to be handled differently than they have in the past. Blockchain may also reduce the number of people required to process and verify the information being passed between individuals and organizations.

The benefits of blockchain adoption:

**disintermediation**
**immutability**
**transparency**
**near-real time**
**frictionless transactions**

—may be realized when organizations build their solutions around blockchain's potential.

# Smart contracts at work

**Using blockchain, entrepreneurs are disrupting how online transactions are processed through the use of tokens and smart contracts.** These mechanisms are designed to ensure that content creators are properly paid for their work, no matter how many times it is resold or reused. A smart contract can identify the parties to a contract, along with any third parties that may have rights to a transaction involving services or intellectual property, like a song or movie.

**When it comes to online advertising, for example:** Brave is building a blockchain-based validation protocol to authenticate and compensate real humans who engage with online advertisements, instead of bots, which are pretending to be viewers.

**Why is this important?** Because today, online advertisers rely on data provided by individual site publishers to determine the success of their advertisements. This data is used to determine how much to pay publishers for the online exposure. The current model may be error prone and unreliable, given that much of the data being provided to publishers is fraudulent. The use of bots to view ads instead of real people can be a significant business challenge.

Using its blockchain-based technology, Brave is working to mitigate this challenge by linking the advertising contract, in a smart contract fashion, validating the data, and helping ensure the advertiser is paying the proper amount for the actual viewership the ad is receiving. This system can also provide the advertiser with additional data that delivers further insight into the person who viewed the ad, as well as additional data for analytics.

**For example:** A person who clicks on an ad for a Black Friday sale on furniture may provide the advertiser with some information on her history—a snapshot of where she has been online, and what other items interested her. At the same time, by clicking on the ad, the viewer may receive a Basic Attention Token for her time and "attention."

**By following the token and querying the databases where it appears, the issuing agent can develop a better understanding of where it is being used and, in turn, determine potential new sectors in which to advertise in the future.**

In a similar vein, we can look at the development of digital asset-focused protocols, such as Tari, which enable digital asset issuers to program rules related to the management, use, and transfer of such assets. The project's backers are contributing to the development of Big Neon, an open source mobile ticketing application that aims to enable the resale markets of tickets for concerts and sporting events, to demonstrate the protocol's capabilities.

Currently, when someone buys a ticket to a popular show or the latest concert world tour, the stakeholders—artists, promoters and venues—get paid when the original ticket is sold for, let's say, $200. If the buyer then turns around and resells that same ticket on the secondary market for $500, the buyer-turned-reseller receives a $300 profit while these stakeholders don't see any additional funds.

**The programmable rules attached to Big Neon's Tari-enabled tickets will follow the tickets through the sales chain.**

When such tickets are re-sold, the resale rules agreed-upon among the event stakeholders will be enforced by the Tari blockchain, including any applicable revenue share terms. Similarly, the application plans to leverage the Tari-protocol to verify the legitimacy of the tickets being sold and resold in primary and secondary markets, reducing the sale of fraudulent and counterfeit tickets.

# Protecting and accessing intellectual property

**Much like how tokens can help ensure that musical artists are paid for their concert performances, these tokens can also help other content creators receive the proper compensation for their work.** Rights to intellectual property are protected by contract law, formalized agreements, and a lot of legal references. Tracking these rights is labor intensive and frequently the subject of debate, especially as rights to property evolve or the parties change. With blockchain and tokens, a legal owner can lock down rights and restrict access to intangibles (songs, movies, etc.) embedding all contractual terms into a smart contract. While most attorneys agree that a smart contract does not replace the need for a formal legal agreement, smart contracts can provide an effective means to track current terms and interact with real-time transactions. Smart contracts allow the right parties to get paid on a timely basis.

When enabled via a smart contract, and paid using a native token, the revenue attributed to a specific transaction can be split among multiple people, ensuring that each person with the rights to be paid for a piece of work is properly compensated, no matter how that work is used or repurposed. This happens because of rules coded into smart contracts that require little need for human intervention.

**Let's look at OTOY's RNDR Network as an example.** Holograms are quite complex and take massive amounts of computing power to produce and host. Because holograms are digital, they are importable, which means the intellectual property (IP) is susceptible to being copied and even modified without permission.

By attaching the IP to a blockchain, RNDR can protect access and specify, on a real-time basis, who has the rights to use the IP. Native tokens to the RNDR platform are required to access IP, which is otherwise locked down. If one person is granted access and then modifies the hologram, the rights to that IP are now shared between the original creator and the one who modified. If a third party emerges and wants to use the new IP, the tokens used for access are then split among those individuals who have rights, providing an appropriate revenue share on a near real-time basis to the correct parties. As content is added and enhanced, these rights are further tracked, adding parties and stipulations in the smart contract and remunerating the modified group on a prospective basis.

# A token approach toward privacy

**While the use of blockchain-based technologies like Tari Tokens offer several advantages for the issuers, they do raise privacy questions and concerns among some consumers, who are concerned with what personal data is being collected and how it may be used.**

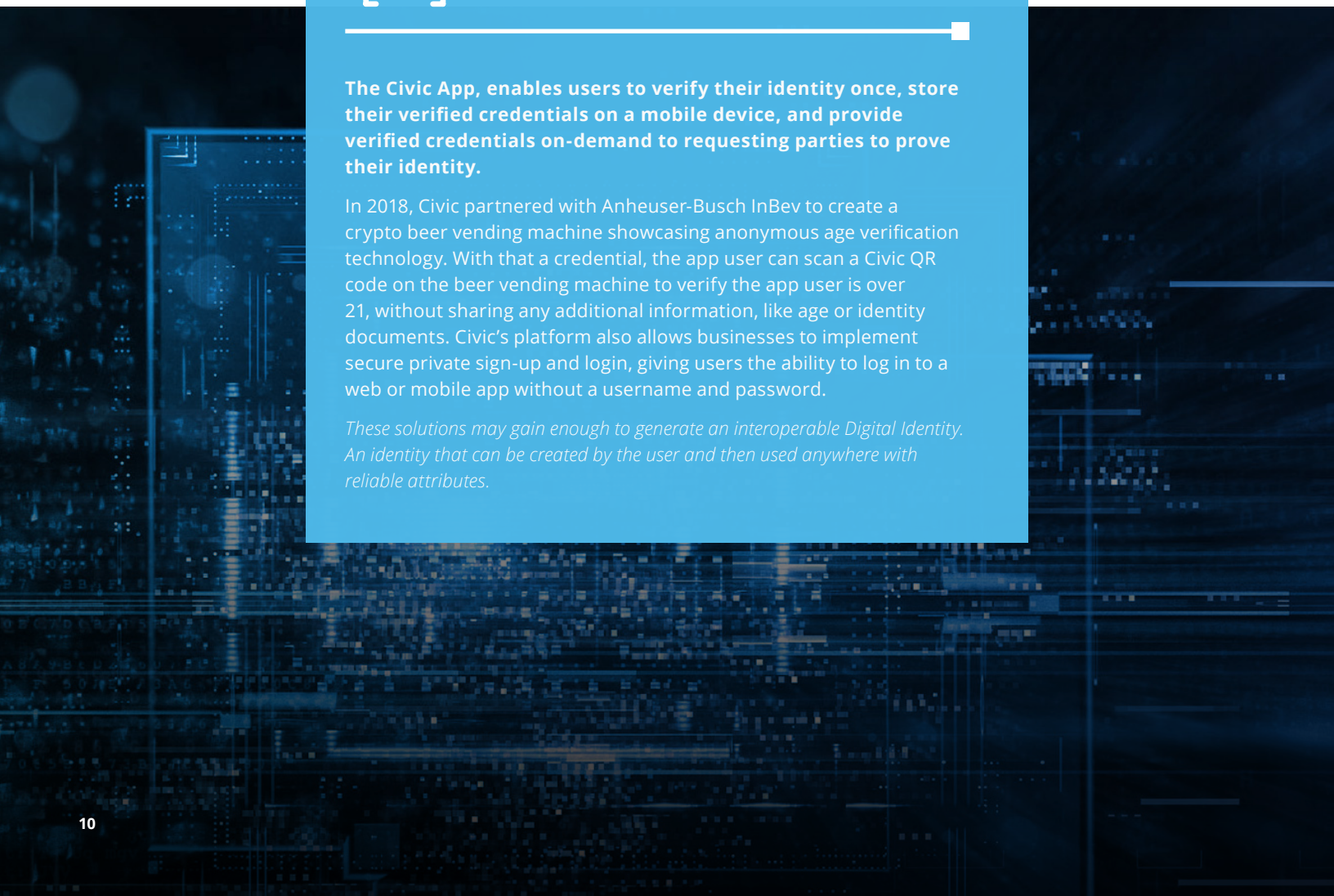
Consumers expect full transparency associated with personal data and are disturbed when businesses monetize the use of personal data without explicit permission. However, attitudes quickly change when consumers are paid for the use of this same information.

**The question then becomes, why has it taken until now for companies to take this approach?** For one thing, many companies didn't think they needed to consider their customers' privacy concerns until recently; they simply assumed that if the data was available, it was theirs to use. That attitude changed, however, as customers became more savvy and began to understand the true value of their data.

**We are also seeing an evolution in the regulatory environment** with the introduction of new laws and regulations like the General Data Protection Regulation (GDPR), which applies to personal data stored or transmitted on blockchain. However, it is unclear how data subjects would be able to exercise their rights under GDPR to delete or rectify their personal data on a blockchain network. Additional challenges in applying the law to blockchain include determining who would be considered data controllers and processors, and who would be liable for data breaches.

**As solutions involving tokens become more common, companies can now address concerns about privacy and unauthorized data sharing by explicitly offering their users a payment in exchange for their data.** Consumers may readily agree to allow their data to be shared so long as they believe the company they are dealing with is being transparent about its intentions, and is compensating them appropriately.

Digital identity solutions have also been developed to give people confidence about who they are interacting with online. Civic is a digital identity company that offers to help businesses and individuals control and protect personal information with blockchain-based identity verification solutions. Through their platform, Civic offers an identity verification API, as well as assistance with login credentials, age verification, and know your customer (KYC) compliance.



**The Civic App, enables users to verify their identity once, store their verified credentials on a mobile device, and provide verified credentials on-demand to requesting parties to prove their identity.**

In 2018, Civic partnered with Anheuser-Busch InBev to create a crypto beer vending machine showcasing anonymous age verification technology. With that a credential, the app user can scan a Civic QR code on the beer vending machine to verify the app user is over 21, without sharing any additional information, like age or identity documents. Civic's platform also allows businesses to implement secure private sign-up and login, giving users the ability to log in to a web or mobile app without a username and password.

*These solutions may gain enough to generate an interoperable Digital Identity. An identity that can be created by the user and then used anywhere with reliable attributes.*

# Linkage to the evolved physical world

**With this evolution in digital commerce, we are seeing linkage and greater emphasis on a subset of physical assets.** Companies such as Rivetz Corp. are using blockchain to provide a store of value for devices to pay for, and control, cyber security services. Steven Sprague, Rivetz's co-founder and CEO, says the blockchain provides a new model to deploy and manage global key management and device integrity. Rivetz' vision is to extend the software-defined network to include the endpoint device, and provide provable cybersecurity controls. A vision where only known devices in a known condition are connected to sensitive data.

**Assets like real estate, in many cases held by private equity funds, are illiquid.**

Tokenization of fund ownership interests is looming on the horizon. This will allow added fractionalization, tradability, and thus added value for owners of the tokens. Issuers of tokens, supported by blockchain platforms, will gain administrative efficiencies and transparency in many categories, including KYC/AML compliance and even financial and tax reporting. Moreover, some believe tokens will become the preferred expression of fractional ownership very broadly, given the precision and transparency features.

# Stablecoins as a means of exchange

## Another important trend is the emergence of *reserve-backed stablecoins*[1]

**Stablecoins are meant to address an effective means of exchange without the worries of volatility of traditional cryptocurrencies.** Much like paper money used to be linked to the gold standard, a stablecoin is a cryptocurrency that is pegged to the value of an underlying asset, such as USD or Euro.

**The issuer maintains the underlying asset, and the coin stability generally requires users to trust that the issuer is properly managing the underlying assets.** Issuers of stablecoins use blockchain to track and confirm the balance of a user, lock down KYC requirements, and track the data associated with historical usage.

Stablecoins tied to fiat allow traders on exchanges the ability to quickly move in and out of cryptocurrency positions, instead of waiting days for fiat movement to or from a bank. Enterprises that accept stablecoins may incentivize users by offering an enhanced experience, better access, or additional benefits. Users can also move money across borders to a relative in need or to put a deposit on a rental property without the time and expense of a wire transfer or the value fluctuations of cryptocurrency. Residents and businesses in countries with hyperinflationary currencies can now protect their assets and conduct business in a normal fashion. By being pegged to traditional currency, stablecoins may prove to be the bridge to mainstream adoption of blockchain technology in insurance, lending, and other industries. Issuers like Circle, Gemini and Paxos are attempting to reduce friction for businesses and consumers around the globe.

[1] *"Stablecoin" in this article refers to reserve-backed stablecoins. This article does not address less proven types such as "algorithmic" stablecoins that are not backed by reserves but are controlled by an algorithm that adjusts the number of stablecoins available in tandem with consumer demand.*

# Emerging disruptors entering the mainstream

**As blockchain continues its evolution** (and especially its move into the corporate mainstream), it may only be a matter of time before the tenured entrepreneurs and enterprise digital executives begin working with the emerging disruptors to further redefine traditional business models and create new blockchain-centric solutions.

**One of the key reasons for this eventual convergence is related to inspiration and the differing outlooks that each party brings to the worktable.** For legacy organizations, the freedom of thought and "anything's possible" attitude of emerging disruptors are key drivers behind their motivations. The ability of emerging disruptors to approach problems and opportunities in a new, gravity- and boundary-free manner may simply be too tempting to ignore.

Because these newer players are experimenting and building new business models without the constraints of legacy processes, they are innovating at a rapid pace by focusing on what is possible using blockchain, and then dealing with challenges as they arise. In many cases, these companies are using blockchain to change the very nature of what "transactions" represent, and are changing how consumers and enterprises perceive a transaction or a company's value proposition.

For the emerging disruptors, on the other hand, the inspiration is about scale. While their ideas and approaches may be unconstrained, many of the companies currently exploring the limits of blockchain are challenged by the complexities involved in scaling their solution. Their big ideas have not yet translated into "big business" in the same way as achievements for digital enterprise organizations. For these organizations, the ability to scale and build a reliable infrastructure could allow their becoming a global brand and enough of a draw to lead to future partnerships with the organizations they are currently trying to disrupt.

The flipside of inspiration is fear, which is also impacting new partnerships between legacy organizations and emerging disruptors. For the legacy organizations, business transactions, ecosystem structure and customer engagement models will change. Some of the newer, more agile players will be instrumental in redefining the playing field, and those who do not grasp the new realities of a blockchain-driven enterprise could be left behind.

For the disruptors, the fear may lie in being too late to the table. As legacy organizations begin to recognize and accept the new realities they face, they may look to partner with – or acquire – those emerging companies they believe will help them remain competitive. The emerging disruptors who hesitate to plan for a more consolidated future could struggle, no matter how innovative their solutions.

# Navigating the Complexities

**With innovative business models comes the need to engage thoughtfully on the regulatory environment, best practices and strategy. Professional advisors are left with dated rules and age-old playbooks, as they evaluate the application to this new age of innovative commerce.**

## Tax

Tax advisors in this space are asking questions like "What's the thing?" referring to the technical analysis required to determine what a token or cryptocurrency represents under a tax lens. Determination of cryptocurrency as a security, commodity, debt, inventory or cash equivalent bears significant consequence to income tax, indirect tax, and payroll tax analysis.

This varies by state and by country, with a constantly evolving point of view by regulators and little authoritative guidance. Commerce enabled by tokens and cryptocurrency brings us into a world of barter transactions requiring determinations of character (capital vs. ordinary) and basis tracking of fungible assets. It may be necessary to chart out new transaction flows among stakeholders and question what each transaction represents, the application of sales tax or VAT, informational reporting requirements (e.g., 1099s), and how to report on a tax return.

## Technology

Technology consultants are now in the business of debunking the blogs, and educating and debating what blockchain does and doesn't do. We see new vernacular in the debates as to what is "on-chain versus off-chain," or how "tokenomics" need to encourage good behavior. The advent of new protocols and platforms requires re-imagining an appropriate technology stack – one which continues to evolve at both the core and the edge, as innovative solutions emerge across developer communities to help bridge the technology from its current nascent form to an enterprise-grade future. Scalability, accessibility, and ease of operation continue to pose challenges to wider-scale adoption and ecosystem-wide implementation. Orchestrating a simple and intuitive user experience that abstracts the technical aspects – wallet, addresses, certificates, gas, etc. – making blockchain invisible to the user and focusing instead on the business process and terminology may be key to wider acceptance and success.

While building a scalable blockchain solution is complex, processes deserve ongoing consideration. Blockchain has inspired many legacy businesses to re-evaluate their technology platforms and processes, and while they may not end up with blockchain, it has inspired creative thinking and questioning apparent barriers. With emerging commerce, it is important to think strategically about where the business is likely to go and how it is different rather than merely being the same business on an upgraded technology platform.

## KYC/AML

It is widely acknowledged that financial services is among those industries facing the most significant disruption by blockchain technology. As an early enabler for virtual currencies, such as bitcoin, and early associations with illicit actors, such as Silk Road and the dark web, blockchain was initially viewed by regulators with considerable skepticism. Among other things, its inherent qualities, such as speed, cross-border functionality, irreversibility, and pseudonimity caused concern that they would likely be deemed attractive to money launderers and sanctions evaders. Regulatory uncertainty with respect to the applicability of AML requirements such as Know Your Customer (KYC), have been blamed for stifling innovation among the players in the ecosystem. Ironically, blockchain may prove to be an effective tool for satisfying regulatory requirements as a trusted repository of information, a mechanism for verification of identity, and a record of transactions.

Traditional solutions for KYC and transaction monitoring cannot effectively address the risks presented by market forces driven by blockchain. To fill the void, emerging disruptors in the AML compliance space have developed blockchain solutions challenging the dominance of legacy verifiers of identity, such as of credit bureaus and sanctions/watch list providers.

## Controls

Regardless of how organizations may work with blockchain or cryptocurrencies, they will need to have certain internal controls in place to ensure the reliable and secure operation of the technology. One of the most critical areas centers on the granting, reviewing, and removal of access controls to encryption keys or other system settings. Access controls are also dependent on appropriate delegation of authority and segregation of incompatible duties. Another important area of internal control to ensuring the maintenance of adequate books and records is timely reconciliations between transactions recorded on the blockchain and transactions recorded in the entity's financial and tax records. The exact nature of the blockchain technology, and the financial and tax policies will determine what reconciliations are necessary. Other areas of internal control to be considered include change management, business continuity, and processing integrity of transactions.

An entity's knowledge of the individuals or organizations they are transacting with can be important to ensuring the appropriate accounting for transactions and to ensuring that the entity is not unknowingly facilitating unlawful transactions. This should be considered in the context of internal controls over customer acceptance and transaction monitoring, in addition to other regulations that apply to the business that may drive additional controls that must be implemented.

## Audit

For Certified Public Accountants (CPAs), and specifically the CPA Auditor, the nature of blockchain technology being a distributed ledger will inherently impact their profession. In collaboration with regulators and professional standard-setting bodies, the CPA Auditor must embrace the opportunities and challenges in having clients who have adopted blockchain technology in their operations and financial reporting process. There may be increased transparency and the ability to automate routine audit tasks. However, inaccuracies due to error or fraud can occur in both traditional and blockchain operations. Additionally, we have seen the introduction of new risks for blockchain adopters to maintain proper custody of the private keys that enable the owner to perform transactions.

In the future, blockchain may provide the CPA Auditor opportunities to provide both enterprise organizations and the emerging disruptors with new service offerings, such as blockchain platform assurance, digital asset validation services, and smart contract assurance, as well as the traditional financial statement review and audits.

# Trends enabling the future

**Can anyone recall a time when there wasn't some form of common carrier, like a postal service that provided a service in the collection, transport, and delivery of goods?** The advent of a postal service served as an intermediary to move goods, and it inspired an evolution in commerce, including the launch of larger private companies to compete and offer premium services in the delivery of goods. However, up until the 1990s, the speed of commerce and communication was a function of highly manual processes and cursed by the limitations of traditional methods of transportation.

In the 1990s, the Internet, based on a vast interconnected global network and a new application called "email" that harnessed the power the Internet, enabled global commerce and communications at a velocity previously thought to be impossible. Today, the boundaries of commerce once again are being pushed, as evidenced by innovations from companies like Brave, Otoy, and others. These companies are helping to redefine business models, commerce, and the relationship between businesses and consumers. These companies may be the founding members of the next stage of evolution in commerce.

The role of the intermediary is also changing given blockchain technology. The immutability of data is being impacted by cryptography, shared open platforms to connect ecosystems, and fewer dependencies on humans to verify the transaction or record. However, while technology can't capture every edge case, old and new business models can benefit from blockchain technology. And it seems impractical that a sophisticated and dynamic smart contract will bridge all of the gaps needed to satisfy our complex legal system that governs contracts. As such, we are likely to see an emerging industry of dispute resolution services specific to smart contracts.

**We are witnessing a decreased level of utility in funds that only serve as a means of exchange across legacy financial systems lacking traceability or the ability to interact with technology.** By contrast, we see tokens which can unlock features on a platform and also provide near real-time remuneration traced to the appropriate parties with rights to intellectual property. Digital funds management has more utility than cash. Much like written notes on a dollar bill in circulation, we now witness cryptocurrency which may track the history of its users, immutably, and be available for all to see. It is an interesting time for regulators and enforcement agencies as they apply analytics in tracing and documenting nefarious activities. And the data attached to this history tells a story about the users providing value to modern enterprise.

Traditional asset classes previously thought to be illiquid are now trading in small pieces on decentralized exchanges. This is changing the world of investing, with a much broader segment of the population now having access to a fraction of real estate in New York or a fraction of a famous painting.

**Decentralized ledgers are housing data, verifying transactions, and confirming dependencies in contractual relationships with few requirements of any human touchpoints.** We are entering a world where the humans design and agree to transaction types, not individual transactions. With blockchain, we see an increasing need for strategic thinking among humans, while we leave the process to the machines.

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