

USING DISTRIBUTED LEDGERS: BLOCKCHAIN MOVES TO EARLY ADOPTION

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LAST YEAR, WE OUTLINED A LIKELY PATH FORWARD FOR DISTRIBUTED LEDGER TECHNOLOGY ADOPTION, WITH EXPLORATION AND INVESTMENT IN 2015, EARLY ADOPTION IN 2016 AND 2017, AND GROWTH IN 2018.

Over the past year, there have been notable advances in blockchain use across the capital markets industry supporting this scenario further.

NASDAQ launched Linq,¹ a blockchain solution for the issuance, ownership tracking and trading of private equity assets. The Australian Securities Exchange is working to evaluate the possibility of using blockchain technology to replace its current clearing and settlement system.² The Depository Trust and Clearing Corporation, having successfully tested blockchain technology on trading swaps with four banks earlier this year, is now focused on other asset classes.³

As the industry moves into the next phase of adoption, it is a good time to ask yourself: What business processes will be impacted by an industry shift to blockchain? What are the operating model opportunities and implications? What about regulation?

A SHIFT IN THE OPERATING MODEL

At the heart of the long term opportunity is the ability for banks to repoint key operational, risk, and finance systems to distributed ledger technology based shared data platforms and decommission large portions of their process and data infrastructure. It will take time and multiple iterations of the platforms to get to that end-state. The potential for material cost and efficiency gains are what is driving the industry's focus and investment.

A recent study by Accenture and McLagan, a business unit of Aon plc, estimates that the average operational cost saving potential of full-scale blockchain adoption across eight of the largest global investment banks could be in the range of up to 30 percent or more per institution.

This estimate does not yet include the savings that could result from lower transaction fees paid to exchanges and clearing houses. It also does not include the potential savings associated with lower capital requirements. As settlement times are shortened, security deliveries and payments are optimized, and settlement finality risks are reduced, capital that is currently "trapped" on the balance sheet will be unlocked.

But to be clear—blockchain is not a panacea. It will improve some processes, but not all. Banks need to examine their existing operational systems to determine where blockchain can add value in the long run, taking into account the likelihood/concrete examples of adoption by the broader ecosystem, and the demands and role of regulators in the process. Let's look at those two points in more detail.

A NEW OPERATING ENVIRONMENT

Today's operating environment is being impacted by forces both within and outside the four walls of investment banks. If our, and many in the industry's, assumptions are correct, blockchain will be a key element in the operating environment that is beginning to unfold. This technology has the potential to not only reduce costs as outlined above, but could also create a framework for new products and services, and help optimize distinct operational processes.

QUICK FACTS

UP TO **30%**

and more operational cost saving potential by blockchain adoption*

2018

is supposed to be the "year of growth" in blockchain

*Source: Accenture/McLagan

As industry players lay out their plans to leverage blockchain, there are some practical and important aspects to be considered on an individual company basis:

- **A clear plan of action:** There is likely to be a long transition period where legacy infrastructure and distributed ledger models co-exist. What plans need to be in place to retire redundant systems earlier? Where will the biggest cost/benefit ratios be found?
- **Human capital impacts:** Blockchain will require new expertise and skillsets. What hiring and training mechanisms need to be in place to attract or re-tool talent to effectively leverage this new technology?
- **Middle and back offices:** Changes to middle- and back-office functions could be profound and could include significant changes to data centers. One question to ask is what steps need to be taken to address computing power needs for blockchain and how can potential gaps be filled?

LAYING THE OPERATIONAL FOUNDATION

In addition, there are a number of considerations that need to be addressed before banks can tackle some of the more complex challenges associated with blockchain-enabled distributed ledger technology:

- The financial services industry is constantly faced with privacy versus transparency issues as it pertains to client information and proprietary trading/market positioning. In addition, some of these concerns can be at odds with one another when considering the myriad of regulations across asset classes. There are a number of potential solutions to this particular challenge such as consensus algorithms known as zero knowledge proof. It will be important to determine the right balance between privacy and transparency without creating bottlenecks due to latency of transaction and data throughput.
- Considerations around which pieces of data require being stored on- versus off-chain and/or segregated by applicable stakeholders is a key design challenge. For example, will the entire database of the underlying data be stored on chain or only specific fields? This will have a number of implications across storage, network capacity and scalability.
- What will the governance structure look like in terms of granting and maintaining access to the ledger and how will participation or revocation of privileges be decided? How will validation be shared in a fair, balanced manner so as to not overburden one subset of participants?

The right technology architecture could not only address the issues cited above, but could also create an environment that allows for interoperability among blockchain-enabled solutions for data mutualization and clearing and settlement.

REGULATION

To date, central banks and regulators willing to comment on blockchain-enabled distributed ledger technology have expressed some optimism.⁴ Federal Reserve Governor Lael Brainard, speaking at the Institute of International Finance in Washington, D.C. in October 2016, said the Fed sees the technology as “the most significant development in many years.”⁵ That’s because blockchain solutions have the potential to improve data quality, lineage and auditability. From a bank’s perspective, blockchain’s use of analytics and visualization tools could make regulatory reporting more efficient and reliable. For regulators, blockchain could—where appropriate or necessary—provide direct access to data for regular monitoring.

All of this is very positive, but the questions around a broader adoption that need to be addressed from a regulatory angle include:

- **How will standards be created, and by whom?** As the technology matures over time, how will new standards be changed and adopted to keep pace with the technology?
- **How will governance models be structured?** How will expectations around these functions shift in an environment where group consensus is key to success?
- **What regulations will apply to assets that are transacted both on and off chain?** Will regulators accept a bifurcated market?
- **Will rules need to be amended or created to balance privacy and transparency in a way that is acceptable to regulators?**

While there is uncertainty around the regulatory response to blockchain, one thing is certain: Regulators are more likely to respond to banks and industry blockchain initiatives than to provide best practice guidance, at least in the near term. Banks should ensure that their blockchain-enabled solutions comply with all current regulatory mandates, even if certain rules seem unnecessary or redundant. That means taking account of all current regulatory mandates supported via existing front-to-back office processes and they will continue to stand up to regulatory scrutiny. This is where another question comes into play: Will the absolute immutability of blockchain be an obstacle for regulatory purposes?

IMMUTABILITY: FRIEND OR FOE?

One of the most notable features of blockchain is immutability. Yet, this fixed and indelible structure may limit blockchain’s ability to meet certain regulations. The fact that data can be entered into but not removed from the ledger has profound implications for data lineage, auditing and tracking.

By creating a full front-to-back view, banks can better understand the lifecycle of a financial asset and/or contract

in a recording-keeping construct that cannot be altered. This full history certainly intrigues regulatory authorities, as it provides full transparency in areas such as “know your customer”, anti-money laundering and transactional data.

Like any technology, particularly a nascent one, blockchain is not infallible. Mistakes will be made that require adjustments that can't be addressed through the normal process of a "reversing" or "updating" transaction. Already there have been instances where human error has necessitated a “hard fork” in a blockchain solution. There are also examples of both inadvertent and malicious data leakage. What if highly confidential business, employee or customer account data or stolen intellectual property were embedded in a blockchain solution?

To mitigate risk, enterprises must have the ability to address fraud, comply with regulatory mandates, and correct errors and omissions, all while maintaining an immutable audit trail—especially in permissioned systems. It is a careful balance between preserving the benefits of blockchain and providing a safety valve for authorized administrators.

The Accenture-Ateniese redaction capability offers a way to “edit” standard blockchains, while maintaining the fundamental value of the technology’s immutability. Developed in collaboration with Dr. Giuseppe Ateniese from the Stevens Institute of Technology, this new capability was designed specifically for enterprise and permissioned systems. It addresses a range of immutability challenges, including the legal right to be forgotten, human error and illegal action (see figure 1).

With this solution, the blockchain operates as normal for participants as it pertains to the vast majority of experience, value, and expectations. Any editing by designated administrators is subject to strict pre-agreed governance rules. In the rare instance where it is used, any edit to a block leaves an immutable “scar”—a clear sign to everyone that the block has been altered and a critical element in preserving full auditability and transparency. The digital keys required to edit the blockchain are split pieces and divided among the designated governance authorities. It can only be used when there is unanimous agreement and all the keys are joined. Through the combination of a fully auditable process and strict controls, there is now an option to achieve "pragmatic immutability" (see figure 2).

Blockchain redaction is only applicable for permissioned environments and only meant to be used in rare circumstances where there is no other reasonable alternative. For enterprises, having blockchain redaction capabilities in a permissioned environment is akin to having a fire extinguisher: You won't need it 99.9 percent of the time, but you'll be grateful you have it for that 0.1 percent.

Blockchain has the potential to improve processes across an investment bank's operating model. Staying focused on a few key areas may help you navigate a rapidly-changing and complex ecosystem. For example:

- **Replacing existing infrastructure** may require significant time and investment: Do you have a clear vision in place for where you see blockchain and distributed ledger technologies improving processes over the short- and long-term?

Figure 1: Blockchain redaction at work

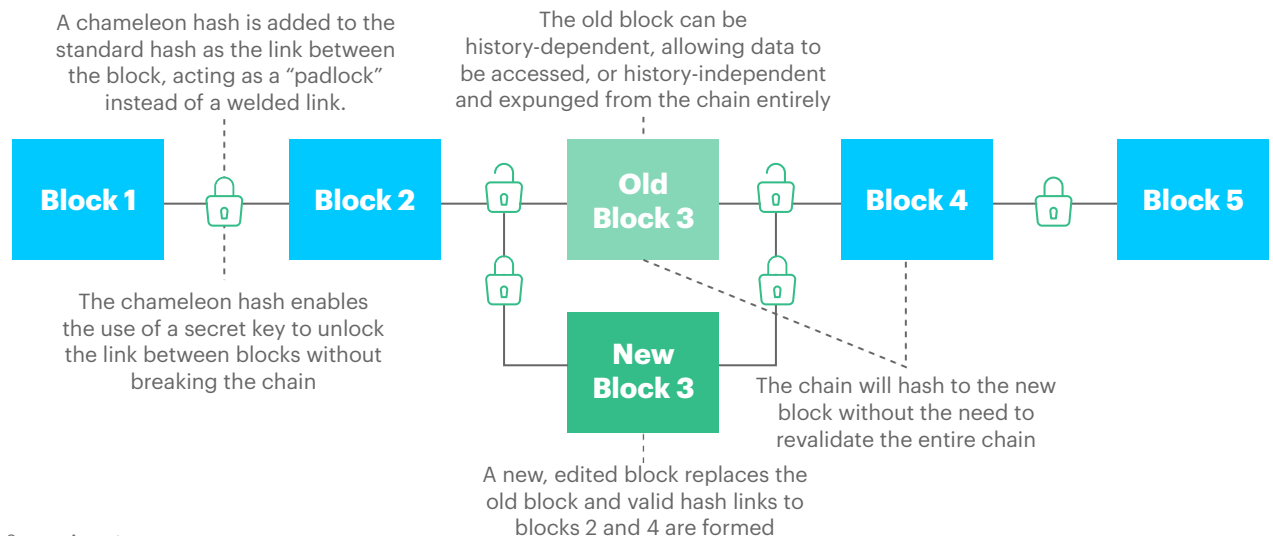
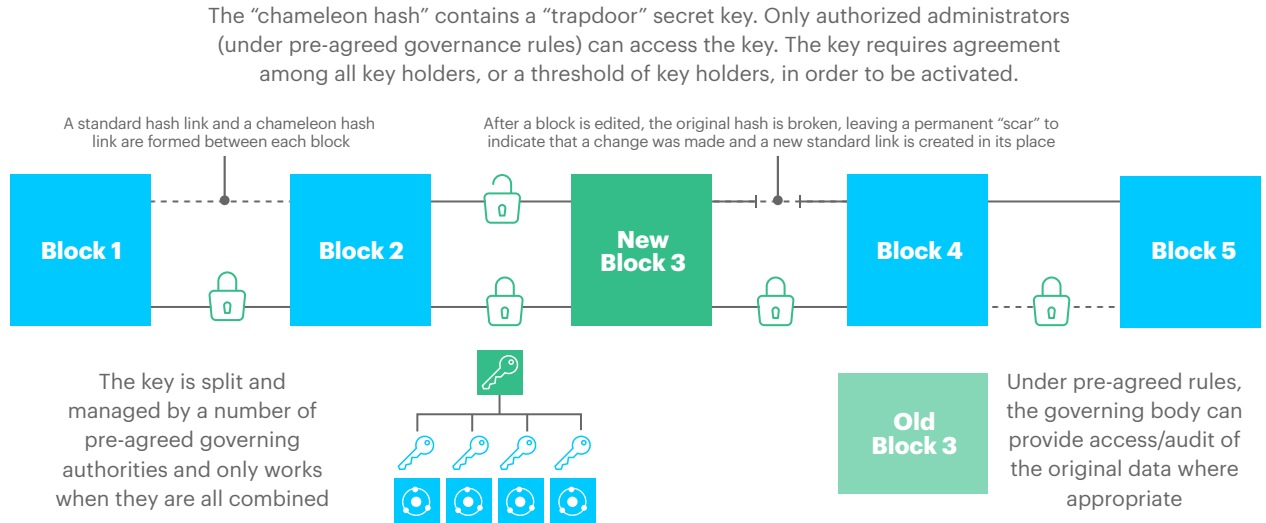


Figure 2: Governing blockchain redaction



Source: Accenture

- **Do you have a working group in place** to stay abreast of new technologies, understand their possibilities and the benefits of their implementation?
- **What are your highest priority processes**, the biggest pain points, or the most logical places to explore feasibility and readiness?
- **What are the processes for developing and testing prototypes?** How will your successful prototypes be scaled with minimal disruption to clients and operations?
- **How will you stay across the regulatory and legislative environment?** Does it make sense for your organization to help shape these discussions?

The benefits that blockchain technology may provide could be significant. While many areas across the investment banking ecosystem need to align for distributed ledger technology to reach its fullest potential, we are already seeing some industry players illustrating what is possible.

Putting the right pieces in place for your blockchain initiatives, aligned to a clear vision, could help you capture short-term opportunities while building a more efficient, secure and cost-effective operating model for the future.

Figure 3: Potential benefits of distributed ledger technologies



Source: Accenture

“ BLOCKCHAIN HAS THE POTENTIAL TO DRIVE SIGNIFICANT OPERATIONAL COST TAKE OUT IN INVESTMENT BANKING.”

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