

CUT THROUGH THE HYPE:

Assessing blockchain's potential

When Indiana Jones (“Indiana Jones and the Last Crusade”, 1989) entered the grail chamber in search of the Holy Grail, he found hundreds of cups in different shapes and sizes. The custodian Knight then reminded Indy that in order to claim the true Grail, he must choose wisely.

Often when discussing the potential benefits of blockchain technology, the story of Indiana Jones and his search for the Holy Grail seems to be the most apt analogy: his search can be likened to the pursuit of the best implementation of blockchain technology. Since the potential powers of the Grail depicted are so disruptive, the search is justified.

The same reasoning can be used in the search for the right implementation of blockchain technology. However, with such a wide variety of industries and countless possible applications to implement blockchain, the 'Holy Grail' of applications, has yet to be discovered.

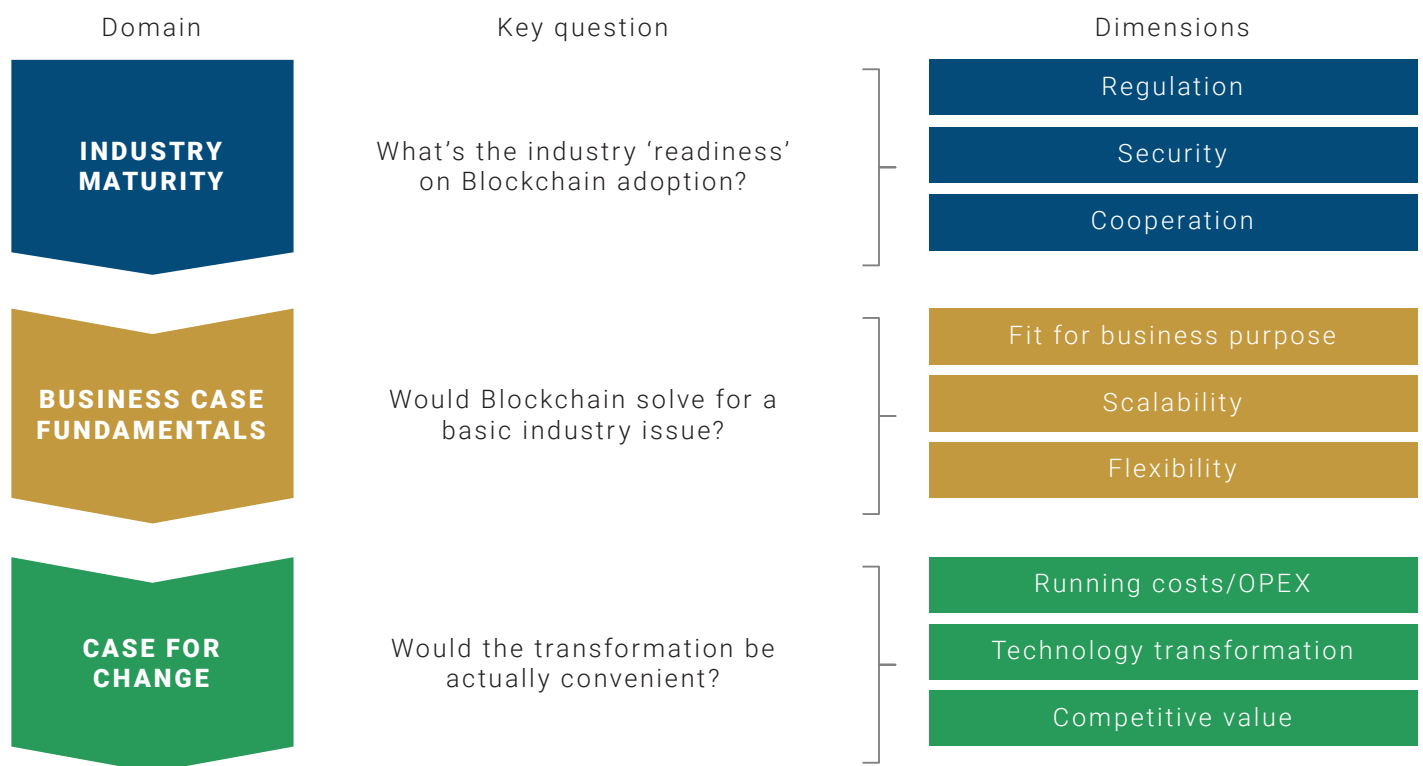
Hype versus reality

How do we assess, then, where blockchain technologies will have the most real and immediate impact?

Blockchain has the very real potential to change our world by disrupting fundamental central authorities (for example, central banks), and it is supporting innovative solutions across a broad range of applications. However, it has, to date at least, fallen short of reaching its potential to disrupt entire industries.

For example, blockchain's first application was cryptocurrency, specifically Bitcoin. However, cryptocurrencies have yet to displace any Fiat currency. So far, they have proven to be neither the store of value nor the superior payment system that was heralded. Regulators are increasingly focused on these assets as potential instruments of fraud or other misuse. In addition, the concentration of, or collusion amongst, miners could threaten the most fundamental advantages of blockchain: immutability and un-hackability over time¹.

FIGURE 1: ASSESSING BLOCKCHAIN'S POTENTIAL



Source: AlixPartners

1. The Looming Threat of China: An Analysis of Chinese Influence on Bitcoin - Ben Kaiser, Mireya Jurado, and Alex Ledger (2018)

INDUSTRY MATURITY

Before any revolution, an industry is required to reach a certain level of maturity. The concept of Artificial Intelligence (AI) gained initial public traction in the late 1970s, but AI has only recently experienced major breakthroughs in industries such as healthcare, retail, and automotive manufacturing. We are finally beginning to see AI replace outdated technologies and improving daily life in a multitude of ways. The AI revolution can be attributed to the amount of data available and the advancement of technologies which are able to efficiently and effectively process massive quantities of data, both of which took time and continuous innovation. Mature and innovative industries have been able to adapt AI technologies and allow AI to disrupt for the better.

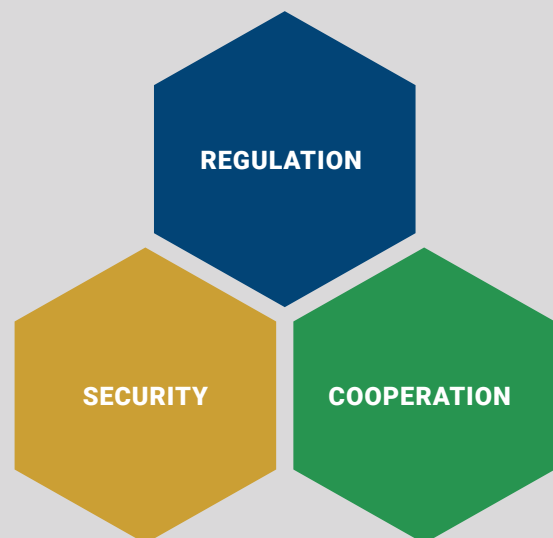
In the first internet revolution, the anticipated disruption affecting the financial sector was thought to be the disappearance of the physical presence of banks. Although the internet revolution did lead to the creation of online banking and some physical locations saw closures or downsizings, physical points of sales are still a pillar of financial institutions' distribution channels. The notion that the internet revolution would simply result in the complete replacement of physical banks was unfounded. The financial industry is simply not at a uniform level of maturity ready for major disruption by blockchain in the same way that the online retail industry, for example, was ready for the implementation of AI and machine learning to aid shoppers, as proven by companies like Amazon and Walmart.

One potential application of blockchain technology is the decentralization of authority, producing increased efficiency and quality of data communication. With this disruption, industry regulations must be flexible enough to adjust and continue to guarantee that all transactions are unanimously accepted and litigation-proof.

The ability to guarantee security is another potential hurdle for the widespread adoption of blockchain technology. Would an entire industry adopt a new technology if the security of its data, its clients' sensitive information and ultimately its profitability was put at risk? What degree of 'sharing' is acceptable in comparison to the risk that data is more accessible than in a centrally managed repository?

There are several cases where the degree of cooperation between market players has positively or negatively influenced the industry's adoption of a specific technology. The potential implementation of a new technological platform results in two trains of thought for existing players within an industry. One scenario could result in individual entities seeing the adoption of the platform as a potential competitive advantage which therefore results in each entity developing a unique and private solution to a shared problem. The second scenario would involve existing players realizing the mutual gains from uniting and creating an open platform or a common standard upon which each of them can develop their own offering. This industry-wide adoption concern is a major hurdle facing the speed of implementation for blockchain technologies.

To assess an industry's degree of maturity for blockchain implementation, three key areas must be analyzed:



BUSINESS CASE FUNDAMENTALS

To disrupt an industry, a new technology must radically solve some basic and fundamental challenges. It is not a simple matter of being economically convenient; disruption consists of drastic improvements in both quality and efficiency.

For example, the adoption of blockchain may eventually remove the need for central authorities in certain industries. (For example, central bank monetary roles may be redundant in a world where currencies are issued digitally.) But would economic systems be more secure and safer or would the overall cost of managing money be lower?

The idea of having multiple decentralized authorities responsible for currency issuance has obvious benefits, but the threat of cyberattacks must be addressed and understood. (In a so-called '51% attack'² someone controlling a majority of network hash rate could revise transaction history and prevent new transactions from confirming.) On a business-as-usual basis, a blockchain solution is likely to be an improvement over current technologies in many industries, but would it still be valid in a 'Black Swan' event?

Efficiency may constitute another key issue: Bitcoin's trust-minimizing consensus has been enabled by its proof-of-work algorithm, resulting in a massive use³ of energy due to the number of miners competing to solve the algorithms that would validate transactions into new blocks. So, the question lingers: is the economic cost of digital currency issuance (and its lifelong management) lower than that sustained by the financial systems today?

Two different dimensions must therefore be assessed to understand the real value coming from blockchain adoption.

FIT-FOR-BUSINESS PURPOSE

Blockchain-based platforms need to perform better than existing platforms. In the specific case of a card payment at a retail shop, a credit or debit card can be swiped and in a very short time (usually under 1 to 2 seconds) a response is generated. Would a blockchain platform be able to meet such a short response time or would a blockchain platform offer other benefits in comparison to existing retail transactions such as security or fraud protection?

SCALABILITY

Financial services businesses see billions of transactions happening every month and in very short time frames. For instance, Visa handles around 150 million transactions per day. Considering credit or debit cards, existing platforms can easily handle three to four hundred transactions per second. These 'traditional' IT platforms are designed to ensure 24/7 service to meet these high-volume needs. The underlying technology is several decades old, but a cheaper or more efficient replacement has not surfaced yet. Could a blockchain-based platform meet the stringent requirements of such a 'mission-critical' platform? SWIFT, the world's leading provider of secure financial messaging services, has been closely following distributed ledger technology and while it recently confirmed that working blockchain is among its strategic priorities⁴, they have also acknowledged that there is still significant work and investment required by all participants, as well as scalability gaps that need to be addressed.

FLEXIBILITY

In a fast-changing context, the possibility to develop new features or products easily and quickly is mandatory. Legacy transaction platforms like those used for cross-border payments mentioned in the examples above are very rigid and tough to change. A replacement blockchain platform has the potential to challenge existing financial systems and could considerably improve the quality and efficiency, also through the application of smart contracts.

Case for change

Lastly, widespread adoption of blockchain technology will require a clear case for change that can be measured by an undisputed economic advantage over the full lifecycle of a product or service (lower run cost, shorter development time, and servicing, among other things); a convenient implementation cost (acceptable payback period, manageable implementation risks, and acceptable deployment timing); and ultimately tangible end-user value (enhanced customer experience or easier platform configurability for company's employees).

2. <https://bitcoin.org/en/glossary/51-percent-attack>

3. <https://digiconomist.net/bitcoin-energy-consumption>

4. <https://www.swift.com/resource/gpi-real-time-nostro-proof-concept>

A practical application: issuance of securities over the blockchain

Issuance of securities (including, but not limited to, bonds) and their lifelong servicing is today still largely paper-based and involves a high number of intermediaries that makes the process inefficient, risky, and ultimately expensive, especially for smaller companies. Blockchain with its smart contract management capabilities could radically change the industry.

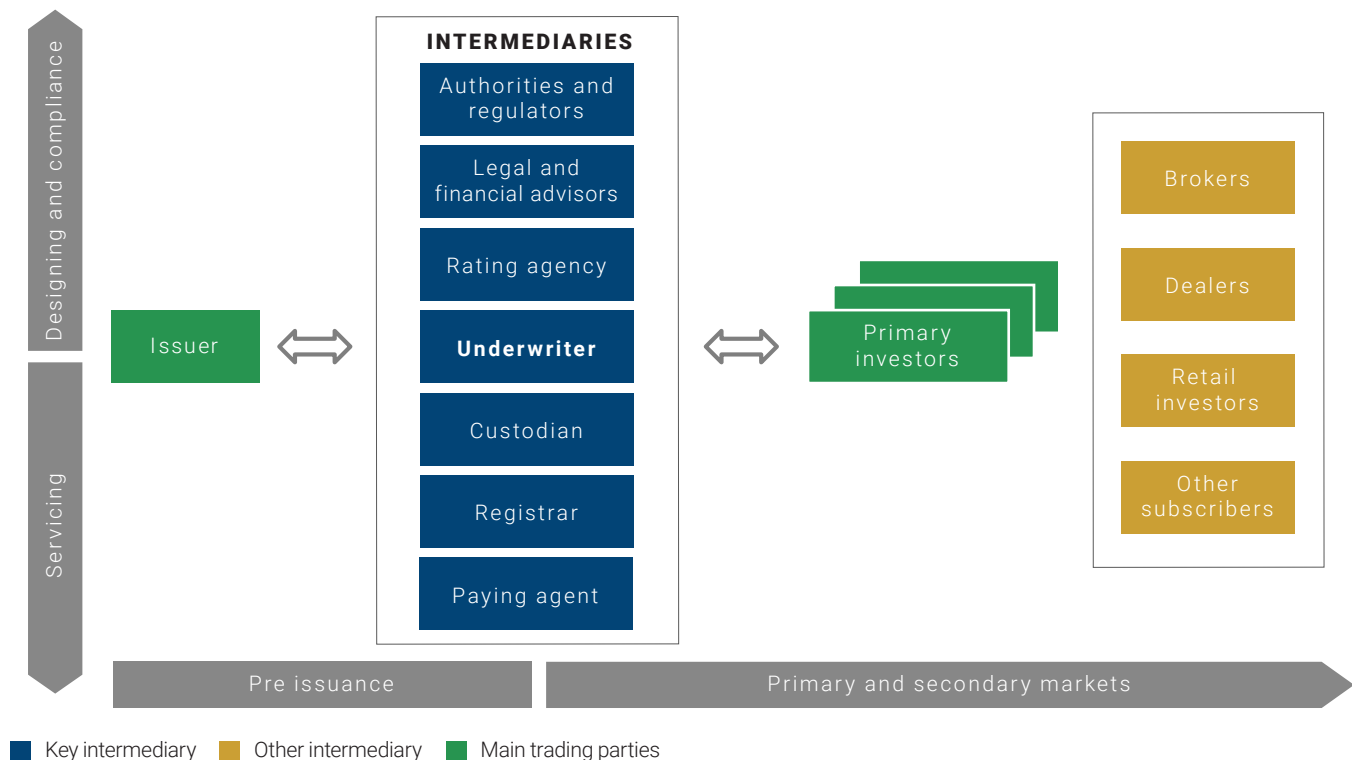
In order to assess the likelihood of the adoption of a 'new' industry standard, we must first evaluate the industry's 'readiness' for blockchain adoption. In the case of securities issuance, that means looking at the policy framework, cybersecurity standards, and the degree of cooperation among the largest players.

HIGHLIGHTS:

The issuance and trading of securities is a government-regulated process, and traditional issuance process is often subject to:

- **High number of intermediaries involved**, thus increasing overall costs charged to the Issuer, and often prevents SME to access this way of funding. According to our analysis based on a range of reports (Bloomberg, Haas Institute), the 'all in cost' for the issuer (as a % of face value) ranges from 0.83% (investment grade) to 2.58% (high yield bond), sometimes exceeding 10% for issues below \$10 million
- **Long clearing and settlement cycle**, eventually accompanied by counterparty risk
- **Servicing subject to manual processes and reconciliations** (multiple versions of the truth, or poor quality of information)
- **Lack of transparency and limited audit trail** (this might be particularly relevant for securities traded on secondary markets)

FIGURE 2: BOND ISSUANCE – STAKEHOLDERS AND INTERMEDIARIES: SIMPLIFIED OVERVIEW



Source: AlixPartners elaboration

FIGURE 3: BOND ISSUANCE – KEY ASSESSMENT METRICS DEFINITION

		KEY METRICS	DESCRIPTION
INDUSTRY MATURITY	Regulation	Policy framework	Availability of a clear regulatory framework
	Security	Cyberattacks	Capability to resist to cyberattacks
	Cooperation	Stakeholders cohesiveness	Degree of cooperation of main players aiming at creating an industry standard
BUSINESS CASE FUNDAMENTALS	Fit for business purpose	Settlement time Audit trail	Time to settle transactions Capability to trace events and make quick audits possible
	Scalability	Process automation	Degree of process digitalization and automation
	Flexibility	Add new/maintain functionalities	Flexibility of the solution to add new functionalities or modify existing ones
CASE FOR CHANGE	Running costs/ OPEX	Issuance (% of F.V.) Full asset lifecycle	Cost of issuance in % of the Fair Value Cost associated to the servicing of the bond across the lifecycle
	Technology transformation	Cost to access/ join networks	Cost to access and join networks required to execute the issuance and the servicing of the bond
	Competitive value	# intermediaries Degree of manual intervention	Number of intermediaries involved in issuing and servicing Need of manual activities (e.g. reconciliation tasks)

Next, we consider the key business case fundamentals, which include settlement time, management of the audit trail, process automation, and the flexibility to add or change process functionalities.

Finally, we compare the economics of bond lifecycle management under the current system to that under blockchain.

Assessment results of blockchain's potential for securities issuance

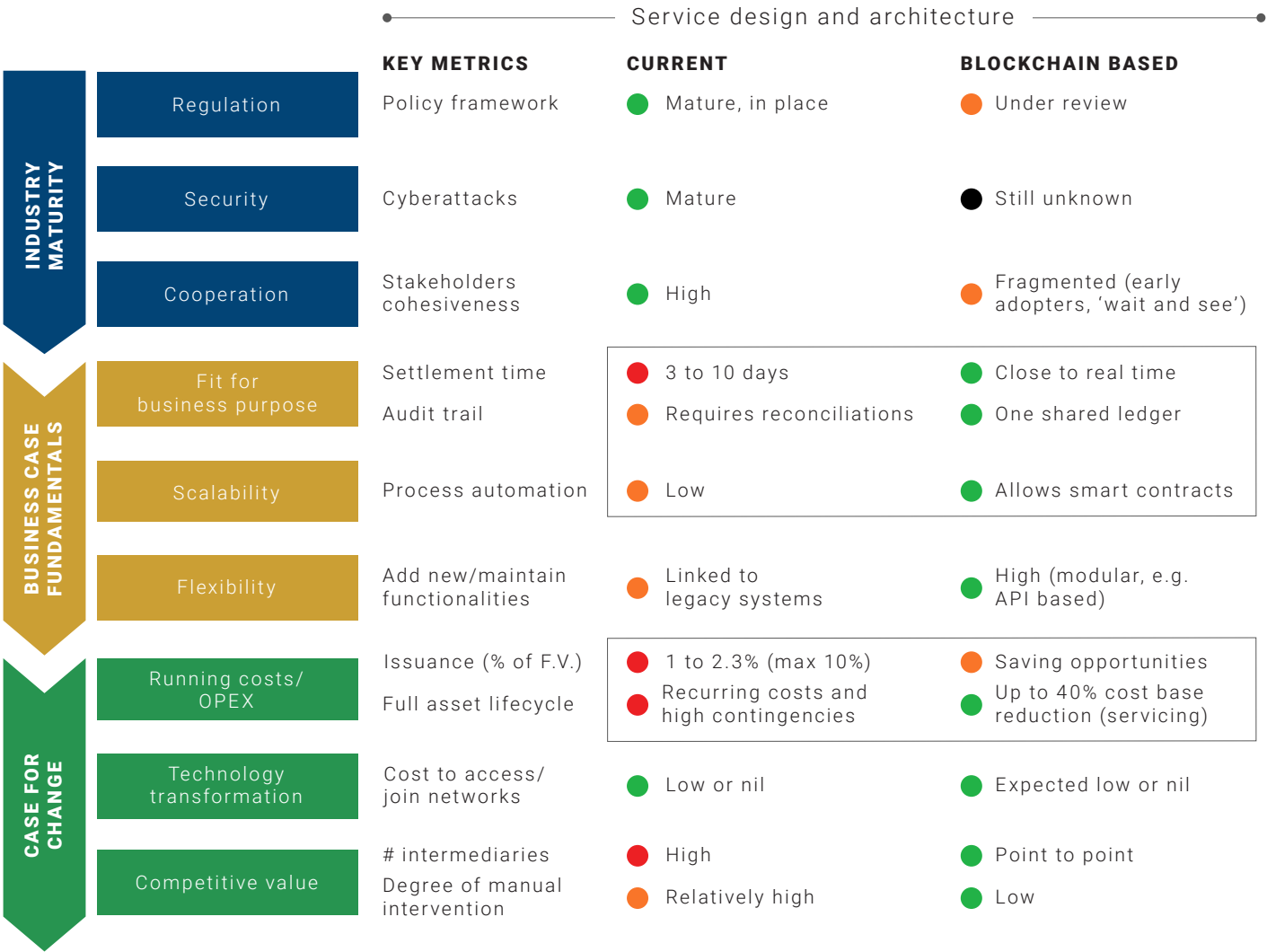
On pure business fundamentals, blockchain promises much by way of improvements over the existing system: faster execution, higher reliability, and lower cost along the whole lifecycle, enhanced flexibility to add new functionalities or modify existing ones, increased transparency of bondholders (which would be very important, for example, in the event of bankruptcy).

In addition, the economics associated with a blockchain-based system seem very attractive across most of the metrics we analyzed. The bond lifecycle management should be more cost efficient due to the reduction in complexity (number of intermediaries involved), full process digitalization (paperless), and avoidance of most common reconciliation activities. Overall, the reduction of the number of intermediaries ensures that less fees should be paid and more effective exchange of information should take place among stakeholders (for instance, but not limited to, the execution of payments or change in ownership, also through the application of smart contracts).

However, based on our analysis, many hurdles remain before blockchain can replace the existing system. The industry does not appear to be ready to adopt blockchain. Regulatory frameworks are yet to be formalized in full and only a few countries (for example, the UK) are pioneering this technology supporting start-up companies in the application of blockchain along the whole lifecycle. Cybersecurity standards are still unclear, and risks still need to be fully analyzed. Ultimately, it is not clear whether the industry will build a single standard or, as it seems now, several independent attempts will emerge, with no clear design on the interoperability of the solutions.

In summary (fig. 4), although the new technology can ensure opportunities for cost optimization and servicing efficiencies, the industry disruption is yet to come mostly due to (i) the lack of widely accepted common standards, (ii) the limited track record around reliability of automation and application of smart contracts, and (iii) the uncertainty around views of regulatory bodies over different countries.

FIGURE 4: BOND ISSUANCE – OVERALL USE CASE ASSESSMENT



Cutting through the hype

Using securities issuance as a test case, then, a model assessment framework for the application of blockchain technology and its likelihood for adoption in the near- to medium-term becomes clearer.

While perhaps not the Holy Grail that has been promised, blockchain technology still has the potential to improve selected processes, and a rigorous and analytical approach can help cut through the hype to identify these.

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