Blockchain in Capital Markets

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The capital markets industry is going through profound changes in business dynamics due to regulation, technology -led market disruption, and the transformed economics of core business areas. The era of digitalization has witnessed sweeping changes in industry mindset – while many firms took nearly a decade to stabilize after the 2008 crisis, they were soon confronted with expectations of a new way of doing business as a result of the digital revolution. These new expectations meant changing norms in an industry with long persisting issues like:

• Lengthy settlement cycles (US SEC finally enforced T+2 settlement mandate in Sept 2017 while instruments like leveraged loans still take weeks to settle trades)

• High costs of collateral after implementation of regulations like Dodd Frank, Basel III

• High transaction costs due to presence of intermediaries in payments, asset exchanges, etc.

• Inefficiencies in processes like reconciliation

With the advent of Blockchain, capital markets firms already have the next level of disruption within sight and many of the traditional challenges could well be addressed by the technology behind bitcoin. The basic functions of blockchain are:

• Decentralized storage of the transaction/asset data across all the participants

• Immutability of the data stored due to hashing principles

• Smart contracts which can execute transactions/actions based on business rules

The benefits and impact of Blockchain could be far reaching in capital markets across buy side, sell side, and market infrastructure, with the promise of eliminating or reducing the role of intermediaries. There are several potential use cases based on the challenges due to multiple data stores and stakeholders, intermediaries, and limitations of existing technology solutions (Figure 1).

Clearing & settlements
Blockchain will act as a single source of data accessible to both the parties entering into a transaction thereby allowing real time settlements of the transactions and remove process redundancies like reconciliation.

Payments
Through the use of encrypted ledger technology, blockchain will allow fast and secure peer to peer payments, eliminating the intermediaries and thus lowering transaction costs.

Reporting and compliance
Blockchain maintains an immutable record of the process and transaction history. The business unit or regulator which is governing the organization can perform an audit trail on these records. They can also be made a node on the network to monitor in real time.

Transfer of instruments
The blockchain system allows financial institutions to digitally issue instruments and trade them on a p2p basis without the need of intermediaries like clearing houses.

Digital identity
The blockchain-based identity system records the identity of an individual or a corporate entity over the network and shares it with the banks thereby minimizing the efforts for KYC.

Corporate actions
Corporate actions like dividend payments and interest payments can be programed on a smart contract and executed through it.

Collateral
Provision of real-time instead of EoD view of the collateral inventory using a blockchain network thereby optimizing the collateral usage.
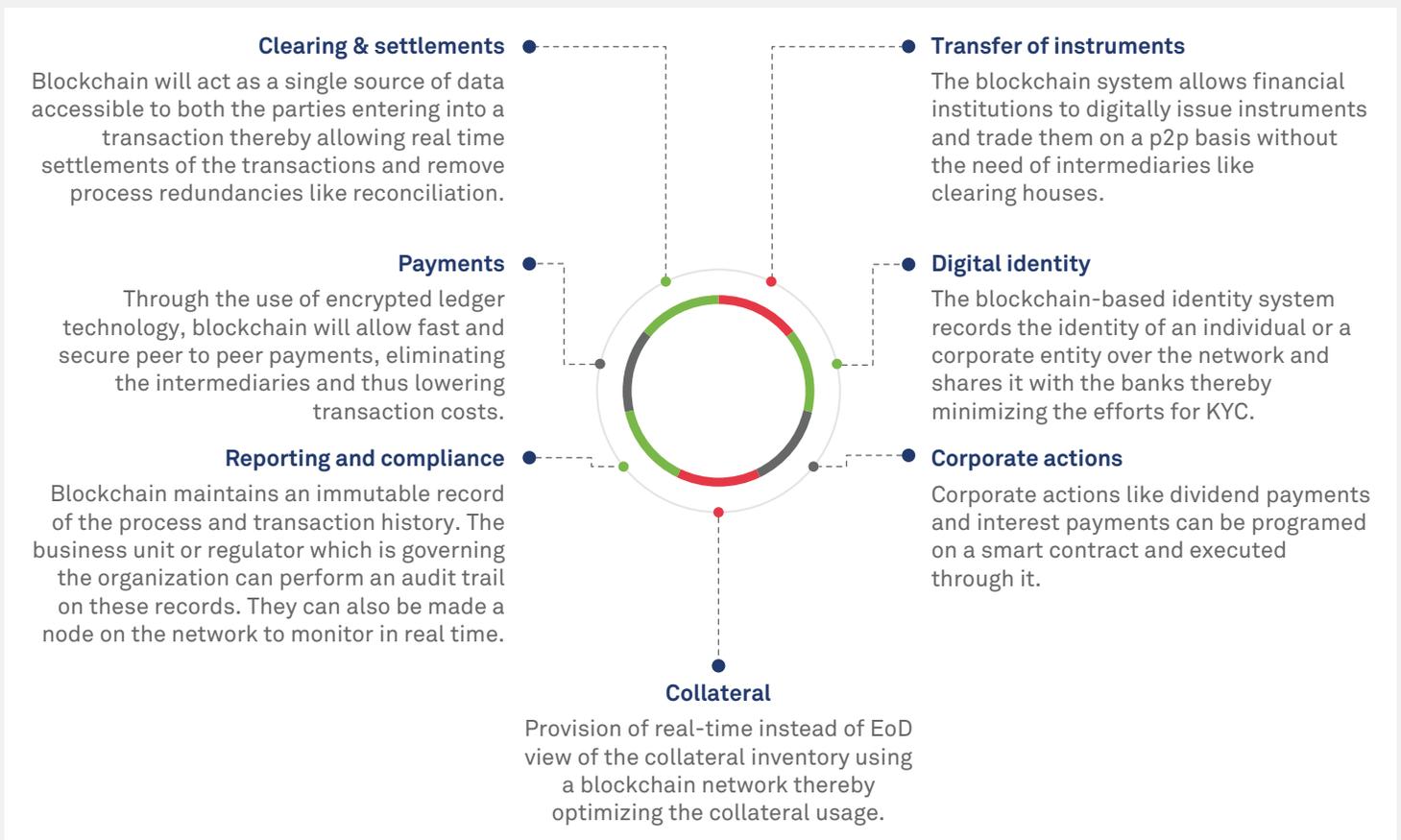
Figure 1 – Capital markets blockchain use cases

These use cases can be built using public, private, or permissioned (consortium) blockchain configurations depending on the contribution required from the participants in the network. While there is a plethora of use cases in capital markets, real- time settlements and collateral management are some of the high potential opportunities.

Use case 1: Real time trade settlements

There is an inherent trade default risk to the trading parties due to the lack of a mechanism which monitors the positions of various financial instruments on a real-time basis. Currently, clearing houses act as intermediaries and absorb this default risk. However, presence of the intermediaries has extended the trade settlement cycle timelines.

On a blockchain system, once a trade is executed on an exchange, the trade details are passed on a smart contract maintained on a permissioned network. The smart contract syncs up with the ledger positions of the instruments maintained on blockchain and does a real-time check on the availability of the traded instruments (Figure 2). As the rules written on smart contract and the position ledger on blockchain cannot be tampered with, this ensures trust and transparency for the trading entities thus settling the trade on a real-time basis. Enabling a near real-time settlement will reduce the counter-party risk (credit risk, exchange risk, etc.) and eliminate issues around reconciliation, communication, and settlement errors.
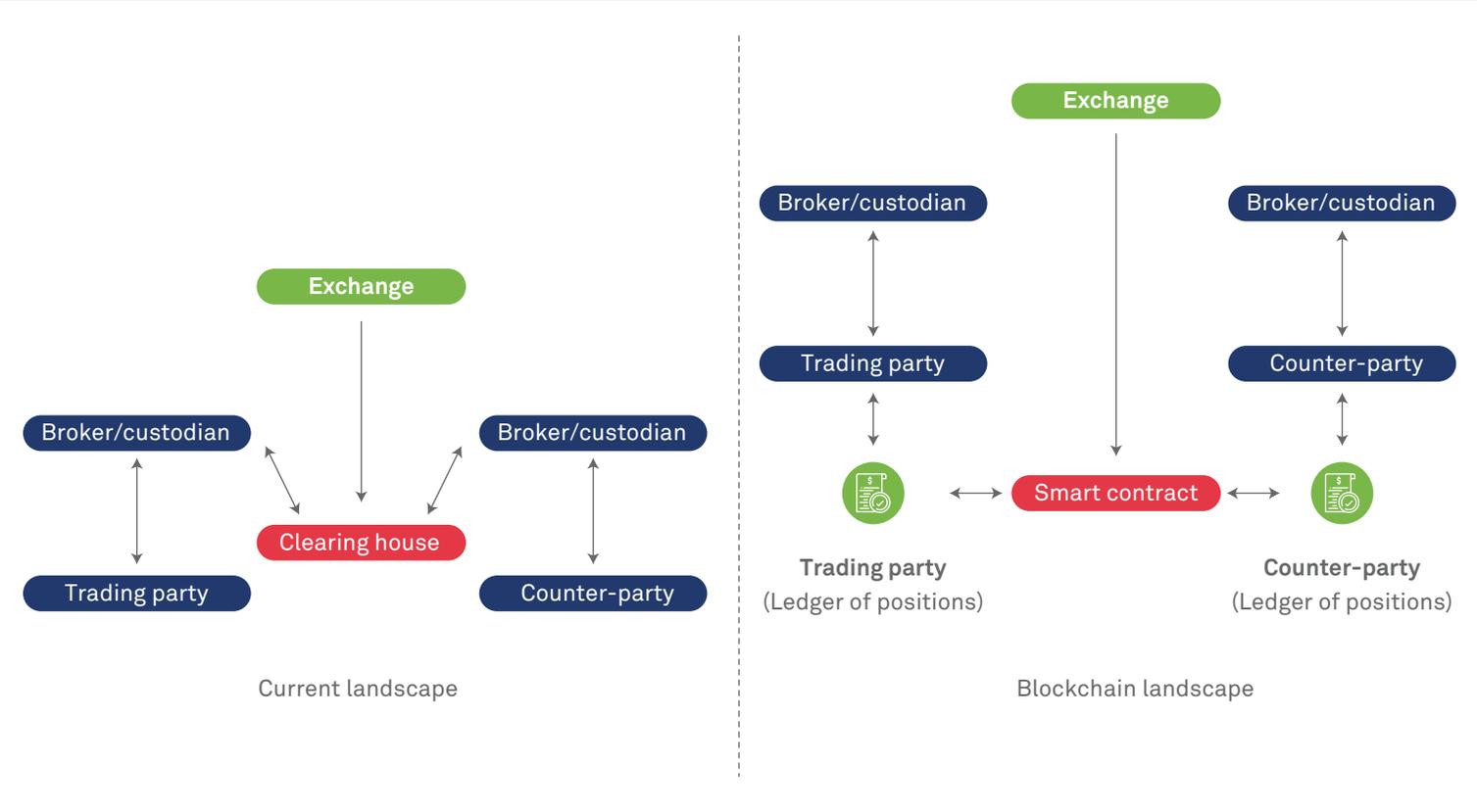

Figure 2 – Settlement process on Blockchain

Use case 2: Tri-party collateral management

Financial institutions engage tri-party agents to manage their collateral and counter-party exposure. The current system facilitates only an end-of-the-day view of the collateral positions, leading to higher collateral deposits. This leads to suboptimal usage of collateral and increased funding costs.

In a blockchain-based collateral management solution, the allocation logic is coded on a smart contract. This contract will have rules primarily pertaining to regulatory mechanisms (Eligibility Check, Wrong Way Risk, Hair-Cut, Concentration Limit). The private rules like credit support annex terms and conditions, owing to their volatile nature, will be off the chain on a private rules engine. The smart contract will interact with the long boxes and the segregated account positions and complete the allocation. The allocated collateral positions are maintained on a distributed ledger in a real-time basis that will be viewed by the parties and the regulators (Figure 3). This will help in releasing the excess collateral of the account holders with the tri-party agents into circulation, creating more liquidity and collateral optimization for the parties.
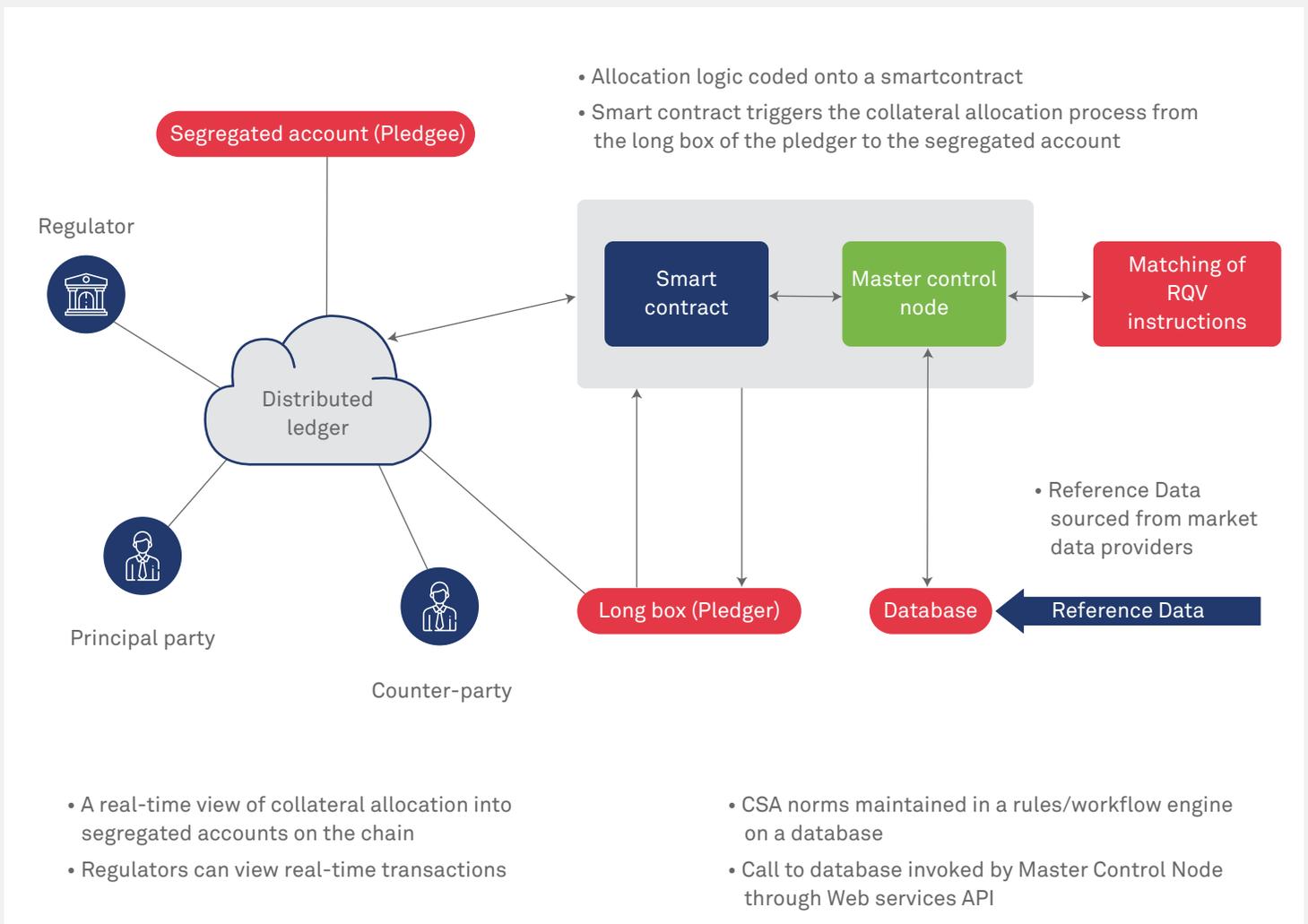

- Allocation logic coded onto a smartcontract
- Smart contract triggers the collateral allocation process from the long box of the pledger to the segregated account

- Reference Data sourced from market data providers

- A real-time view of collateral allocation into segregated accounts on the chain
- Regulators can view real-time transactions

- CSA norms maintained in a rules/workflow engine on a database
- Call to database invoked by Master Control Node through Web services API

Figure 3 – Tri-party collateral management on blockchain

Adoption Path for capital markets firms

Adopting and implementing capital markets use cases will be a step-by-step approach rather than a big bang one owing to the industry complexity.

Institutions should clearly define the use case and qualify based on the adoption feasibility and the cost benefit analysis.

Use case meets the following conditions:

a) Multiple parties using and updating the common data.
b) Need to verify the validity of actions (trust).
c) High cost and complexity due to intermediaries.
d) Delays due to multiple interactions.

Choose the right platform– R3 Corda (specifically developed for financial services), Ethereum, Hyperledger, Multichain, etc. upgrade the IT. For a permissioned network, adopt a consortium approach and invite partners to join.

Field trials with around 5% of the transaction volumes or on customers with less sensitivity to experience. Proper backup options and roll back channels need to be in place.

Qualify the use case → **Evaluate implementation network** → **Prepare the IT and partner ecosystem** → **Implement PoC** → **Conduct field trial** → **Full scale implementation**

a) **Public** – use cases which can allow read, write to anyone
b) **Private** – for use cases which need read, write access within the organization
c) **Permissioned** – use cases which need contribution only from selected organizations

Create a PoC of the use case in an isolated sandbox environment with near real- time data which doesn't impact the customer.
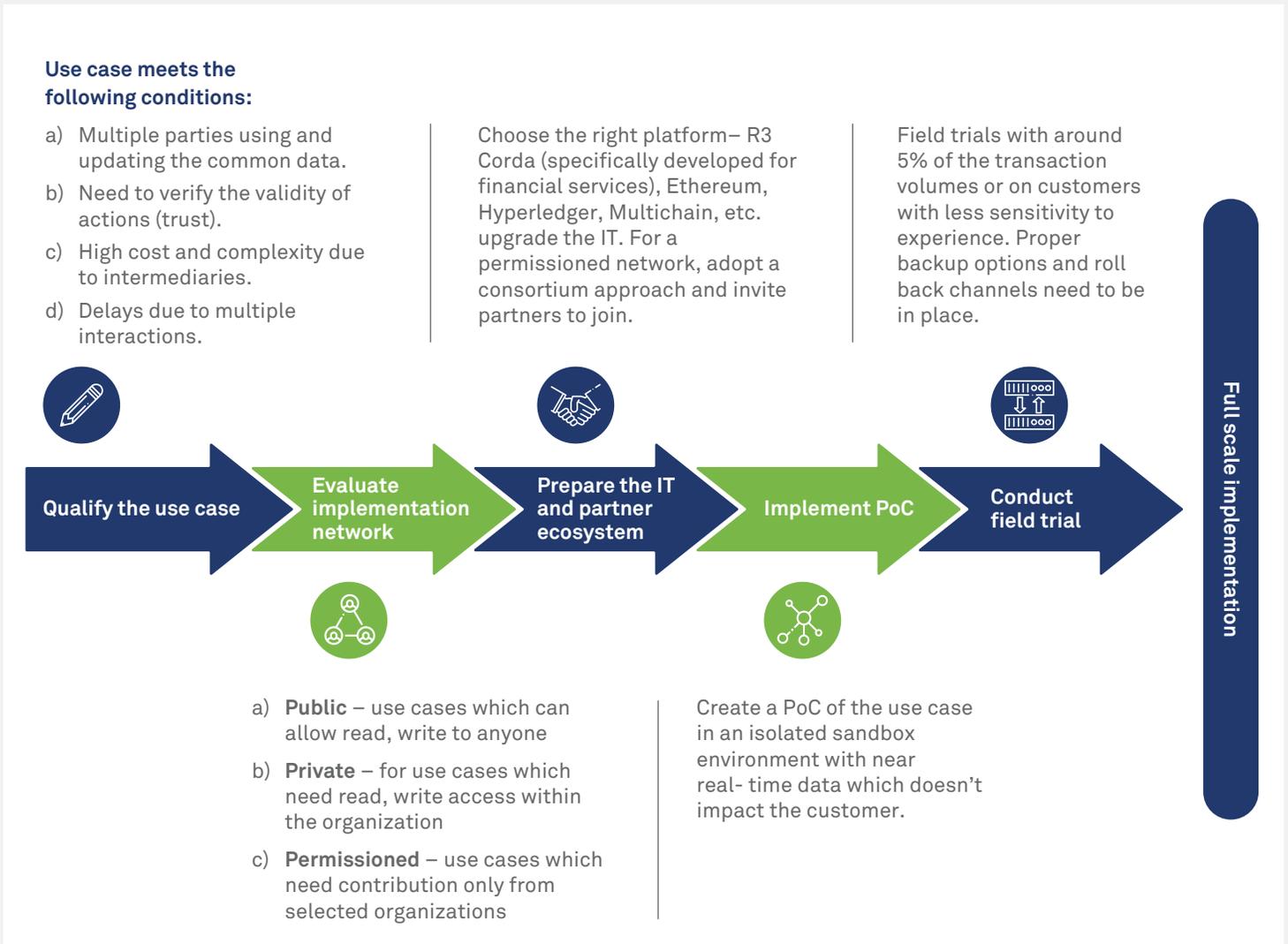
Figure 4 – Blockchain adoption roadmap for capital markets firms

Institutions should leverage the PoC approach to test the use cases as blockchain technology has limitations in terms of scalability and integration into existing systems. Financial institutions can partner with technology providers who offer services like lab, blockchain and crowdsourcing, and thus minimize investment risk and achieve faster results. It is critical to have small scale implementations on blockchain in the next 1-2 years to verify the tangible results and develop the organizational understanding and appetite for blockchain applications. Blockchain-based applications are expected to become mainstream in the next 3-5 years and organizations with mature capabilities and strong partner ecosystems are expected to build a competitive advantage over others who choose to look the other way.

References

1. https://www.reuters.com/article/us-banks-blockchain-ubs-idUSKCN10Z147
2. https://www.coindesk.com/swiss-stock-exchange-to-tokenize-securities-in-new-dlt-platform
3. https://citywire.co.uk/funds-insider/news/fund-giants-partner-with-the-big-issue-for-impact-investing-push/a1177136?ref=citywire-money-latest-news-list
4. https://www.coindesk.com/state-streets-blockchain-strategy-big-and-bold-for-2017
5. https://securities.bnpparibas.com/news/end-to-end-fund-transaction-test.html
6. https://www.bain.com/insights/blockchain-in-financial-markets-how-to-gain-an-edge/
7. https://www.oliverwyman.com/content/dam/oliver-wyman/global/en/2016/feb/BlockChain-In-Capital-Markets.pdf
8. https://www.statista.com/statistics/642140/worldwide-blockchain-technology-capital-market-spending/

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